THROUGH
THE
LEAVES

MAY, 1917
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OU are all being urged from numerous sources to plant every available acre of land to some crop that will increase the nation's food supply. It is hard for many of us to realize that our country is at war with one of the world powers, and that the time may be close when this country will be feeling the results more seriously than now, of the food shortage. The appeal for increased food production must be made to the farmers as they are the source of food supply for the world. An army of food producers is just as essential to the success of our nation at this time as an army in the trenches; and you can aid your country materially by planting conscientiously every available acre of land.

In this connection we desire that you give due consideration to the sugar beet crop on account of the large amount of food produced per acre. Sugar is going to be one of the commodities needed badly, and in view of the food that can be produced from the use of the by-products in addition to the sugar itself it is by far the most patriotic crop to plant.

There may be a certain selfish interest on our part in urging the planting of sugar beets, but we are not unpatriotic because we know its value compared to other food stuffs.

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Most of you have doubtless seen the announcement that the 50c per ton which was promised sometime ago on condition of certain sugar prices, has been promised unconditionally, so that no matter what the price of sugar may be the minimum price of beets will be $6.50.
We are also advised that our company will not for the present at least advance the price of sugar in Colorado beyond its present price regardless of any advances in the market.

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The labor situation is the one thing that gives us more concern than most anything else at this time. It seems that most growers have secured their labor, but we fear that when thinning time comes some of you will be short. We know of several instances where the labor has signed contracts with two or three different growers, and when he moves out he is going to the place that looks best to him and the other fellow will be short. We would like to offer a suggestion in this connection to be used another year and that is that your labor contracts all be made out in triplicate and one copy sent to the company office. This would give us a check on these fellows that sign more than one contract.

We urge that you give these people as comfortable quarters as possible to live in and good water to drink. They will show their appreciation in better work, besides, you will be able to secure the better class of help if you have a good place for them to stay.

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Beet planting has been going on very rapidly during the past two weeks, and nearly half of the crop is now planted. The season is a little behind a year ago, but moisture conditions are so much better that we think the crop will not be much if any later getting a start. We are very liable, when we have a wet spring, to be careless about the conservation of the moisture, thinking that it will be there later in the season in the same proportion as now. Colorado climate is noted for its extremes and we may have considerable dry weather, so it is wise to take advantage of the abundant moisture already in the ground and do our utmost to keep it from getting away from us.

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We want to emphasize the word of caution we have so often given you before—not to get your seed in too deep.
Remember that the germ of a beet seed is very small and cannot push through a lot of earth. One and one-half inches of packed soil is deep enough and with favorable moisture conditions one inch is better.

If for any reason you do not get a perfect stand of beets, we urge that you do not plow them up without consulting our field superintendent. We have seen many 50% and 60% stands make better crops than 80% or 90% stands from replanting.

If you can keep the hoes square on the cutting edges, with square corners, you will find it easier for your help to do good work. A hoe with square corners allows them to get closer to the beets without disturbing as much soil and also reduces the amount of hand pulling necessary to get the beets to a single plant.

We want to call your attention to our method of charging for seed sacks. The sacks are weighed to you with the seed and charged at 10c per pound, the same as the seed. In addition a charge of 30c for each bag is made. A credit will be given on the same basis for all bags returned to us in good condition before August 1st. This makes these bags cost you about 40c each which is more than they are worth to you. This charge is made necessary owing to the difficulty we are having to get burlap bags. Please note the date of August 1st. Our books will be made up at that time and we cannot receive them after that date.

We are busy at work setting out about 3,000,000 seed beets, the Longmont factory having the job of growing 325 acres of seed this year. For the past two years our farming operations have all been given over to the growing of this seed, and all our crops planted with the idea of getting our land in shape for the crop of seed. We have had to change our methods somewhat, the idea of profitable farming operations having been given up to the idea of producing a crop of seed.
MEASUREMENT OF LAND

For the past two years many of our growers have taken advantage of the opportunity to have their land surveyed by Messrs. Richardson, Bice & Van Zant. These gentlemen will again arrange to do this work on the same basis as last year, viz: 12½c per acre, plus a charge of 50c for each field. Cards will be mailed you later which you can fill out if you desire this service. Remember, you get a blue print of the field which you can preserve for future years. This has proven very satisfactory in past years, a much larger number availing themselves of the privilege last year than the year before.

Before another booklet reaches you, a large part of the thinning will be started. This is a critical time with the sugar beet crop. Do not allow the beets to get too large before being thinned. If you have a large field that is going to take your help some time to get over it, start when the beets are very small so they will not be too large when the last ones are being thinned.

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Meteorological Report
MARCH, 1917

<table>
<thead>
<tr>
<th>Temperatures:</th>
<th>1917</th>
<th>1916</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Maximum ..........</td>
<td>44.6°</td>
<td>62.64°</td>
</tr>
<tr>
<td>Mean Minimum ..........</td>
<td>20.4°</td>
<td>27.90°</td>
</tr>
<tr>
<td>Monthly Mean ..........</td>
<td>32.5°</td>
<td>45.27°</td>
</tr>
<tr>
<td>Departure from Normal</td>
<td>-4.2°</td>
<td>+8.37°</td>
</tr>
<tr>
<td>Maximum ..............</td>
<td>75° on 29th</td>
<td>78° on 16th</td>
</tr>
<tr>
<td>Minimum ..............</td>
<td>-10° on 3rd</td>
<td>15° on 1st</td>
</tr>
</tbody>
</table>

Precipitation:

| To Date ..........     | 1.92       | 0.80       |
| For Month ............| 1.23       | 0.34       |
| Greatest in 24 hours | 0.58 on 11th| 0.13 on 23rd|
| Departure from Normal| +0.21      | 0.67       |

Number of Days:

| Clear ............... | 14         | 25         |
| Partly cloudy ...... | 7          | 1          |
| Cloudy ............. | 10         | 5          |
| Total .............. | 144        | 144        |
Once a war has been decided upon every effort of every citizen must be bent upon bringing about a decision in the shortest possible time. Unnecessarily prolonging a war is wasteful of human life and money and therefore not humane.

At present we are called upon to accomplish mainly two things. Transportation between this country and the seat of war must be kept open. This we may well leave to those more competent to handle the problem. Just as much, or more, important is it to increase the available supply of goods necessary to conduct the war efficiently.

The most important item today is the food supply not only of ourselves, but of those actually fighting our battle on the other side of the ocean.

The available food supply has been decreased by decreased production all over the world. The farm population has been heavily drawn upon for the armies. Old men, women and children and what horses are left cannot maintain the same level of production as before the war. Some good farming districts have been devastated. Besides last year was an unusually bad season all over the world.

The prospects for this year are not very good. For the first time since these statistics have been published the estimated total yield in all countries of all grains, is one hundred and fifty million bushels below the estimated normal requirements.

The acreage of winter wheat in this country is a little
larger than last year, but the condition of the crop is so bad that the yield is estimated at sixty million bushels less than in 1916 and two hundred forty million bushels less than in 1915.

The planting of spring wheat has been delayed by the late spring so that good crops hardly can be expected.

The total wheat yield of Canada and the United States in 1915 was about one thousand three hundred million bushels, in 1916 eight hundred million bushels. In the face of decreased production we have probably an increased consumption. Armies are notoriously wasteful consumers of food. Actual destruction in warfare on land and water also contributes.

The situation according to all competent authorities is so serious that there is a legitimate doubt whether the available food supply for the allied countries, including our own is sufficient to allow as many men as are deemed necessary to perform strictly military work only. Therefore many government officials and other organizations have addressed the farmers of the nation to exert their utmost efforts to produce more food.

It is very difficult for us to conceive that an actual shortage of food really exists today or is threatening for next year. While it is undoubtedly true that the extraordinary high prices prevailing now are partly due to speculation and hoarding, nevertheless, these manipulations are possible only when demand exceeds supply.

When food prices advance as fast as they have in the past six months the corresponding adjustment of wages is liable to create a great disturbance of the industries of the country. This is an element of great danger at a time when the output of the industry is imperatively needed for the conduct of the war. Mere fixing of prices by the government alone is not going to secure a just distribution of food. It has taken the belligerent countries several years to find this out and to create the machinery by which this gigantic problem can be handled with a fair degree of efficiency.

On the other hand relatively high prices are needed to
stimulate an increased production as well as to force an economical consumption.

An increase in the available food supply is therefore necessary and desirable:

(1) Because an actual shortage of available food threatens the now allied belligerents.

(2) Because extraordinary high prices due to this and other causes are liable to create complications in the industries of the country.

(3) Because it will be unusually profitable to the food producers as prices must remain above normal.

An increase in the available food supply can obviously be brought about:

(1) By cultivating more acres.

(2) By raising more on the acres already under cultivation.

(3) By more careful use of what we raise.

(1) An increase of the cultivated acreage in the states we are interested in is possible mainly on the dry farms. It is late in the season and not very much can be expected.

The time to take out the doubles is when the beets are small, during the first work, not after they have grown large.

The difficulties of obtaining proper equipment and men capable of handling it at short notice are great. Presumably most people capable of handling such propositions were prepared to handle all they could before the war was declared. Furthermore, since the available equipment and men are limited an excessive opening up of new lands will simply deprive the older irrigated districts with established farms and safe crops of the necessary labor. In other words, an increase in acreage on the dry lands may decrease the production on the old farms, and therefore the net increase in production may be only slight and out of proportion to the effort necessary.

A great deal would be done in preparing the new land
for the crops in 1918 if it were not for the fear of a slump in grain prices. The English government has already guaranteed to the farmers minimum prices for three years, averaging considerably above one dollar per bushel. This is probably the most effective measure the government could take to insure an increase next year.

On our old irrigated farms we have been in the past frequently quite liberal with our land. Many spots on the farms bearing no crop might easily raise something with small additional work. Even if nothing is produced this year such pieces can be gotten ready for next year. If the war should cease this summer the demand of Europe will be great enough to keep prices above normal. To provide the population of Germany for one week with bread enough will take two hundred forty-five thousand tons of wheat or about four hundred ninety thousand average acres of wheat.

In the past we have not looked with much favor at taking care of small things. We were fortunate enough to have a surplus of most everything. Plowing one more furrow next to the ditch or the fence does not seem very important. Nevertheless, the total acres of good land lying idle on all farms is worth a great deal.

(2) Raising more on the land already in cultivation is of course rather easy to talk about. No doubt many farmers do the best they can. Nevertheless there are always some farmers a day too late with everything they do. A plow, a cultivator, a horse, a wagon or any other machine should be put in readiness the day before it is intended to be used.

Many tons of alfalfa leaves are lost in the field because the alfalfa is not windrowed and placed in cocks as fast as possible.

Last year many tons of beets were not grown on account of delayed first irrigation. There are many little things like this almost every farmer knows, but does not do. This does not mean that the farmers as a class are any more deficient than the rest of us, but his deficiencies affect us consumers a great deal. In other years there was often
the excuse that prices were not high enough to pay for an extra effort. This excuse does not exist this year.

The landlord, if he is an experienced farmer, can perform a very valuable service to the community and himself if he spends some time in helping his tenant to avoid mistakes.

There are many alfalfa fields too thin to produce a good yield of good hay. In many parts of the country such fields are seeded to barley, improving both quantity and quality of hay harvests.

Many winter wheat fields after the harvest could be disked and planted to rape at a small expense. The rape furnishes excellent pasture for any animal except milk cows. Rape gives milk an undesirable flavor. Turnips can be used for the same purpose. Grazing sheep on turnips is an old established practice in England.

A great deal of farm work is not done on time or as well as it might be on account of lack of good help. The labor situation is getting more serious every day, far more so than most people realize. It is absolutely necessary to utilize to the fullest extent what we have. This means a careful planning of all work by everybody. It also means bringing the man looking for a job as quick as possible to the place where he can work.

The Sugar company fieldmen will be only too glad to render any service within their power along those lines. We urge the farmer not to hesitate to call on them. Granges and Farmers' Unions have a good chance also to be of additional service to their members in this respect.

(3) Better use of what we raise is possible in many cases. Downright waste and destruction is criminal today, when it was perhaps the best we could do before the present crisis. Burning of strawstacks is one example. Hundreds of tons of apples last year were rotting on the ground in northern Colorado. It would be much better
to have the children stay away from school for a day and preserve the fruit. The Denver market last October and November was flooded with apple cider from New York, while local produce could not be sold. Apple butter could well be marketed by an organized effort of the farmers in large quantities.

Feeding alfalfa in such a manner that 20% is wasted or used for bedding is another instance.

Grazing beet tops instead of piling them and hauling them to the feed yards is also a waste.

There are some people, who ought to know better, talking about forbidding the slaughter of calves. With a shortage of food it is much better to use what little we have for good animals instead of scrubs. Besides a calf needs a considerable quantity of milk, which could be used much better directly as a human food. Nevertheless there is no doubt that enough roughage is wasted on most farms to carry a few calves or lambs to maturity with little extra expense. Otherwise, an increase in live stock production worth talking about is possible only if we increase the available supply of food. However, this must not be done at the expense of crops which can be used directly for human consumption.

An acre of wheat in our irrigated district will furnish about twelve hundred pounds of flour and eight hundred pounds of bran, shorts or middlings, with the present milling system. An acre of barley yields eighteen hundred pounds. If fed to hogs it will probably furnish not more than three hundred sixty pounds live weight or two hundred eighty pounds of salable carcass. This is less nourishment than the flour, leave alone the meat or milk which could be produced from the bran or shorts.

An acre of potatoes yielding twelve thousand pounds furnishes nourishment equivalent to almost twenty-four hundred pounds of flour and very likely much less, according to the starch content of the potatoes.

Sugar beets furnish much more human food than either one in the form of sugar besides producing more than two hundred pounds of beef although tops, pulp and mo-
lasses are by no means properly fed yet. This is true even if the additional labor of producing the beet and of manufacturing the sugar is taken into account.

In fact, the writer firmly believes that our northern Colorado district with from 15% to 20% of the cultivated area in beets, ships out more actual human food than any district of similar size in the best parts of the corn belt.

Our so-called alfalfa pastures in many cases are badly handled. They are often irrigated while the stock is in the pasture. This means destroying a great deal of the stand. All pastures should be divided into two parts and alternately irrigated and pastured.

The death rate of our live stock on the farm, particularly that of the young stock, is astonishingly high. A large part of that is due to bloating, or otherwise improper feeding. Boys and girls on the farm could be gotten in many cases to take care of young animals with profit to themselves and to the old man.

Your personal supervision of the thinning helps you and helps the thinners

Some ten years ago it was reported in Cleveland that J. D. Rockefeller's daughter asked for an increased allowance. After some studying, J. D. told her that their average monthly gas bill had been in the past forty dollars per month and that she could have all she could save of this amount. This may seem a little small for John D., but it is the right principle.

Around some schools after lunch hour the ground is littered with slices of bread and other food. This kind of waste is particularly bad in many city households.

The average annual consumption of wheat per head of population is about three hundred pounds. If we decrease that by one pound per head per year we would have in the United States a hundred million pounds. An average acre of wheat yields in this country about one thousand pounds. Such a saving then presents the output of one hundred
thousand acres of wheat, available for the needs of our European allies.

These nations are fighting what we now conceive to be our battle. They are sacrificing the lives of untold thousands of men in their prime. The least we can do is to sacrifice a few of our wasteful habits. This does not even mean a sacrifice of money in this case, but just the opposite.

We are too much inclined to trust in some spectacular invention by some wizard to solve our problems, while the immediate thing to be done is a well planned effort by every individual. There is nothing a nation cannot do if every individual does his share.

County Offers Special Prizes for Fair Exhibitors

The board of County Commissioners of Boulder County has announced its designation of special premiums to exhibitors at the Boulder County Fair in addition to the regular Fair Association premiums.

The Board offers as follows:

- Cattle division ..............$159.00
- Swine division .............. 24.00
- Sheep division .............. 24.00
- Poultry Sweepstake .......... 5.00
- Horticulture ............... 10.00

The rules governing competition in these classes, in addition to the usual fair rules, provide that the animal must be bred and raised in Boulder County and that entries in the male classes must be registered.

The Board of County Commissioners is also offering special trophies to the winners in certain contests which will be held. The contests will be between the cooking and canning teams of the Girls Clubs of the County, and also in stock judging by the boys of the Industrial Clubs.
Influence of Stand Upon Yield of Sugar Beets

Asa C. Maxson

THE relation of stand to the yield of sugar beets is of especial interest to the grower this year because of the backwardness of the season.

Under normal conditions planting is well under way by the 20th of April. This means that replanting can be done with much more assurance of good results than when the planting is delayed as it has been this spring.

Replanting seldom produces as good a yield as first planting unless the latter produces an extremely poor stand.

That the stand does not influence the yield as much as other factors such as soil, irrigation and time of planting is certain.

Proper cultivation ahead of the thinners makes it easier for them to do good work.

For several years experiments have been carried on to determine the effect of different stands on rich and poor soils. The results show conclusively that the soil has more influence upon the yield than the stand. On poor soil the difference in yield between beets spaced 7-9 inches and those 14-16 inches was 0.8 of one ton per acre in favor of the wider spacing and on rich soil 0.5 of one ton per acre.

Beets 7-9 inches apart in the row produced 3.5 tons per acre more on rich soil than on poor soil and the beets 14-16 inches apart 3.2 tons per acre more.

Two fields examined last summer produced 10.7 tons
and 13.4 tons per acre. The stand was the same on both, being 16.4 inches between beets on the average.

Two other fields produced 13.4 tons per acre each, one with a stand of 16.4 inches and the other 19.7 inches.

In another case two fields producing 11.9 tons and 11.8 tons per acre had stands of 18.6 inches and 22.8 inches.

In the face of these figures we are forced to conclude that the stand was not the most important factor in the production of yield.

Irrigation has more influence than stand, as will be seen from the following:

As an average of three years tests, beets spaced 8-9 inches produced 4.10 tons per acre more with 3 and 4 irrigations than with but one. Beets spaced 13-16 inches produced 4.10 tons more with 3 and 4 irrigations than with one.

During the same seasons the spacing made a difference of 1.25 tons per acre with both 1 and 3 or 4 irrigations. The wider spacing produced the heaviest yield through the test.

In 1913 the same kind of seed was drilled on April 28 in one part of the experiment field. On May 17th., another part, separated from the first by a 16-ft. road, was drilled. Both of these were irrigated twice. The early planted produced 21.83 tons and the late planted 11.34 tons per acre. Making due allowance for possible differences in the soil of the two parts of the field there can be no doubt that the time of planting had a marked influence. Too early planting, however, is apt to give poor yields as a result of frost or disease in the seeding beets caused of unfavorable growing conditions.

We must not jump at conclusions and assume from what has been said that wide spacing, i.e. from 14-16 or more inches, is best. We have been dealing with extremes. There is a very great probability that from 10 to 12 inches is better than either 8-9 or 14-16 spacing.

This year with a shortage of seed, a late season and the probability of late replanting we should not be in too much
of a hurry about plowing up what may appear to be a poor stand.

A field with a stand of 11.5 inches produced 12.39 tons per acre, while another with 22.8 inches between beets, produced as much as 11.84 tons per acre last season. This latter is as good as the late planting in 1913 referred to above.

There are three points which the writer wishes the readers of this article to bear in mind:

1st. That no matter how good a stand of beets you may have, if the soil is not good, the time of planting right, or the beets properly irrigated, a poor crop is apt to be the result.

2nd. That if properly tended throughout the season what may appear to be a poor stand will produce a satisfactory yield.

3rd. That replanting, especially if late, is very apt to produce no better yield than the poor stand of first planting, which was plowed down.

Do not allow your beets to get too large before being thinned
Much is said in recent times about scientific agriculture, some of which is complimentary and some of which is not; even going so far as to say that there is no scientific agriculture. What is meant by the term "scientific?" Science is defined as accumulated and accepted knowledge which has been systematized and formulated with reference to the discovery of certain truths, or the operation of general laws, i.e., knowledge classified and made available in work. Scientific means agreeing with, or depending upon, the principles or rules of science. A scientific agriculture then, is one in which the work is carried on in harmony with the general laws of nature.

In reality, farming, like medicine, is simply aiding nature to do her work, and the more one is versed in what are the fundamental laws of nature, the greater are the results obtained. Those who claim there is no scientific agriculture, base it on the statement that agriculture existed before any one knew anything of science, and further that the farmer is subject to so many varying conditions not under his control that it cannot be held that scientific principles have entered into the results. In most disputes, the real facts lie on some middle ground, so in this case perhaps both contentions have more or less weight. It cannot be said that agriculture is a science in the full sense of the word, for there are many things over which the farmer has no control, but what we wish to emphasize is that farming is largely a manipulation of scientific principles, and that every day these principles are becoming the property or knowledge of the every day man, and are em-
ployed in the most successful practice—sometimes un- knowingly.

That a study of the sciences are of vast importance to any one in agricultural pursuits in this day and age, I do not believe can be denied. That many succeed who have not made any study of the sciences, cannot be denied, but when the results are analyzed, it will be seen that most of that which the latter has gained has been through the application of principles acquired by general observation (more properly common practice). The facts are, that at the present day, the sciences are used more or less in all agricultural work. Being versed then in Botany, Ento- mology, Biology, Chemistry and other sciences, certainly is an aid to one following agricultural pursuits and wishing to realize the most out of them, and as time goes on, that this is true, will be realized more and more.

In agriculture as in other lines of work, these fundamental principles are gotten by study at the beginning, or acquired in some degree by practice and observation as one goes on. The former is in line now-a-days with the

Our field men are here to help you. Make them earn their money

World’s Methods. To more fully appreciate what has been said, let us draw a few illustrations under the various heads mentioned:

Botany—Suppose a horticulturist putting out a bed of strawberries, selected only asexual plants. The result would be growth, but no fruit. The scientific farmer would know the reason, from a study of the conditions. The practical man would only get it by some person like the former giving him the reasons therefor. The comb- atting of smut in grains is but the putting into practice another principle of this science. Entomology—The deal- ing with insects for instance. The man practicing scientific agriculture knows that it is useless to apply a poisonous spray for the destruction of plant lice or any other insect that draws sustenance by sucking the juices of the plant.

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A knowledge of that one principle, namely, that insects are of two kinds, chewing and sucking, enables the scientific farmer to at once lay means for control. How often we see the practical fellow trying to poison the juice extracting insect, at a loss to him of time and money. Chemistry—This enters into feeding and fertilizing operations, especially, if one is to get the best results. Bacteriology—By inoculating the soil with certain bacteria, alfalfa is being grown over large areas where once it was thought it could not survive. This is due to the application of science. Practical agriculture of a few years ago could not grow alfalfa in certain areas for it knew nothing of this low form of life. A knowledge of this science gives the farmer a means of dealing with many plant diseases.

I am just mentioning a few of the most common examples to draw attention to the fact that in every day practice, we are employing scientific principles that have become a part of practical agriculture in comparatively late years, and were it not for this, many of our most common operations would fail at the present time. Until these facts are brought to our attention, we do not realize that most practical farmers, are to a degree, scientific and don't know it. The employment of these principles have become a part of the system now-a-days.

I wish to emphasize, by giving a few illustrations, that there are certain fundamental principles that are applicable under any and all conditions, and only by the application of them can the most desirable results be obtained:

1st. A smooth surface favors blowing of land. Conversely, a rough surface retards shifting of land.

2nd. Making land smooth increases wind velocity at surface and hastens evaporation very much.

3rd. The creation of a mulch breaks up the capillarity (or waterpassing power) of the soil grains, and thereby greatly reduces evaporation. Conversely, hard or compact soil hastens passing power of soil grains, and hastens evaporation. The proper use of this principle is of much value in the use of the roller and other tools in the preparation of seed beds, etc.
4th. The greater the size of the soil particles or grains, the less water holding capacity of the soil.

5th. Oxygen is essential to plant life, and is obtained from the air through the roots, hence the soil must be of such a texture that air will penetrate it.

6th. Heavy nitrogenous fertilization retards maturity.

7th. Growing leguminous crops (alfalfa, clover, beans, etc.) increases nitrogen (fertility) of soils.

8th. Stirring of soil grains (cultivation) increases bacterial activity and changes chemical constituents of soils.

9th. Plants give off (transpire) moisture from their leaves, hence plant growth hastens the loss of water from soils.

10th. Increasing the organic matter (decaying plants) in the soil increases the amount of water it will hold for the use of the crop.

The foregoing statements are agricultural axioms so to speak, i.e., they can be employed at any and all times and under any conditions. The more knowledge one embraces of fundamentals, the more successfully can be met the varying conditions that arise, over which the farmer has not full control. To be sure, any farmer may get results of some kind by abusing the fundamental principles, but this does not alter the fact that he could have gotten much more satisfactory results and much better returns by aiding nature along lines that are in perfect harmony with her laws.

The extended application of fundamental laws or scientific principles are supposed to culminate in the benefits accruing to the country through the teachings of the County Agriculturist. In other words, these men are supposed to take this scientific knowledge that is so well adapted to practical work to the so-called practical man and happy is the man that is so engaged who can rise to the situation instead of devoting his time to those commonplace things that are the property of even the least observing.
Patriotism and the Plow

From "The Country Gentleman"

The world's providers are diminishing. Every country that enters the world war immediately removes from her ranks of producers of food, clothing and other necessaries of life, enormous numbers who will become charges on the nation, non-producers of anything of permanent value. At the same time they become consumers of food and destroyers of property.

Forty million men have left productive employments to engage in destroying and consuming. Armies must be fed, though they return no profit. Every day ammunition and supplies are made to be destroyed and to destroy.

Enormous debts are piling up and must be carried by increased taxes. This nation has vast stores of gold and great wealth, but this wealth becomes less valuable to the nation if there is not food to be purchased. The man driving a plow must produce a surplus not alone to guarantee the security of this nation but to enable us to help those who are already short of food.

The future is all a dark maze. The prices that our crops will bring this year puzzle the most foresighted prophets. No one can offer a farmer a guaranty that prices will be maintained, that his labor needs will be met or that he will be safeguarded from loss should more food be produced than the market will absorb.

The man behind the plow must take his chance along with those who go to the front. The soldier takes his chance with death. The captain who sails a ship from port may face an unmarked grave; the manufacturer who turned over his plant to make ammunition may relinquish most of his chances for profit. Patriotism demands that we offer all if need be.

In facing such an unsettled future many farmers have been moved to retrenchment. They hesitate to take the
chance, but patriotism demands that they so arrange their affairs that we may be guaranteed surplus of food. The provident, foresighted farmer occupies the most secure position today among all our people. He can assure himself a comfortable living if he will plan to eliminate every possible waste and conserve his labor and his acres to the utmost.

It is not in the large surplus of a few farms but in the small surplus of many farms that security lies. A few more bushels of grain from each acre now planted will mean millions of bushels in surplus, and our stores of foods can be conserved more readily than a shortage can be supplied. If the Providential favor of good crop conditions extends through the season there will be plenty of food for all, but if disaster strikes here and there, it is only the surplus of millions of farms that can meet the need.

The man behind the plow who can provide the surplus is a patriot of the first order.

The time to take out the doubles is when the beets are small, during the first work, not after they have grown large.
Why Irrigate the Roads?

J. F. Jarrell

The irrigation season will soon be here and most farmers are foresighted enough to have all ditches, laterals and waste ditches clean and in first class working order, but there is the exceptional man who puts off attending to his ditches till the very last. He is always busy and the last never comes; his crops begin to suffer and the water is turned into ditches entirely unfit to handle the water, because of obstructions of weeds, sand and various other hindrances. Soon there is trouble. A break in the ditch and a neighboring crop or the country road gets a thorough irrigation which is entirely uncalled for and the resulting damage is either paid for by the guilty party or a law suit follows which is more foolish than some people imagine.

When a motorist gets stalled in a mudhole caused from one of these road irrigations, he has cause to become considerably peeved, and it is a sure thing that he will remember the mud hole even though vast stretches of excellent farming land lay on all sides. The scenery of the particular section of country is always eclipsed by the one experience with the mud hole, and the party who is caught in one of these mud traps becomes an active knocker for that particular section.

Our rural sections need boosters, and the man who travels will either boost or knock, so let's try and make a friend of every passing motorist by doing all in our power to prevent road irrigation and aid road improvement. Then the traveler will have a chance to glance to right and left and get a chance to really see your fields instead of keeping his eyes glued on the road for fear of running axle deep into the mudhole or its scar. If everything moves along smoothly the traveler sees things and as he
goes on his way he will spread what he sees, if this is a good impression so much good is done; if it is a bad impression so much harm is done to the locality through which he has traveled. So let's try and have a good report go out for all of Northern Colorado.

Living

Geo. A. McMurdo

We have one life in which to live or merely exist. How to make the most of our lives is our greatest problem. We are farmers by either choice or chance. As farmers we may find it worth while to consider what there is in life for us.

The business of farming gives opportunity for the exercise of all the originality and resourcefulness of the most alert mind. The feeling of satisfaction which follows the production of valuable products from raw materials is one of the farmer's rewards for labor. There is a feeling of pride following work well done, which comes to the farmer with well tilled fields, straight rows and crops free from weeds. A few farmers appreciate the value of neat and well arranged farm buildings. They place machinery in a shed or in orderly groups after each operation. There should be a system for the many farm operations. Have a system and work it, but don't let the system work you. It takes a little longer but the reflex mental effect more than compensates for the extra time by the better quality of work which follows.

One good turn deserves another and the farmer who keeps his buildings, machinery and fields in good order, will find he gets better work from the help, better returns from his livestock investment, and a feeling of pride and satisfaction for himself and family. Such a farmer and his family do more than merely exist, they live.
"IND wheel in the ditch!" How familiar are these words to many a farmer. Perhaps it is at threshing time. The threshing outfit is on the way to his farm; his extra men are hired and waiting for the machine; the thresher is coming up the road, when crack! an old wooden bridge gives way. You know the rest.

To the farmer who wants to avoid such occurrences, and to the road overseer who has the building of culverts under his direction, a few suggestions regarding culverts may be of value. Small culverts, such as those spanning ditches and roadway drains, and which can be built by the farmer himself, will be considered.

The box culvert is the best for use in a level country, and for spanning ditches of the size usually found on farms. The box culvert requires less excavation to be made and the forms are much simpler and easier to make than those for arch culverts.

A culvert 12 feet long will generally be found about the right length for most roadways on the farm. Culverts on public roads will of course need to be longer in order that teams may pass each other at any point in the road. The size of the opening will depend upon the amount of water the culvert must carry, usually an opening 18 inches square is large enough for farm laterals. Roadway culverts may need to have an opening 3x3 feet in cases where a large amount of country is drained by the gully or ditch.

Old lumber lying about the farm may easily be used
for forms, provided that it is not warped, and contains no knot holes. Since most of the culvert is covered by soil, the outer surface need not be finished smoothly. The inside of the culvert, or the waterway should be reasonably smooth, which condition may be secured by using smooth planks for the inside forms.

It is not necessary to go into the detail of mixing and pouring of the concrete in the article, since all of the cement companies issue booklets which take up the various points in a simple manner. These booklets are free, and the farmer can get much valuable information from them.

The proper mixture of concrete for the box culvert under discussion is: For the sides and wing walls, 1:2\(\frac{1}{2}\):5, and for the top slab 1:2:4. This means 1 part of cement to 2\(\frac{1}{2}\) parts of sand and 5 parts stone or good gravel. If bank run gravel is used the sand is counted as gravel. The quantity should be mixed thoroughly while dry, the water added and again mixed thoroughly. The concrete should have a jelly-like consistency when placed in the forms.

Either metal lath or heavy woven wire netting should be placed as reinforcing in the top slab. This is not placed so as to be in the center of the top slab, but nearer the
under side as shown in the sketch. This is done in order
to develop the full strength of the material.

Many otherwise properly constructed culverts have
given way because the forms were removed too soon. The
outside forms may usually be removed in two or three
days, but the planks supporting the top should not be
taken out for at least a week. It is best to give the con­
crete six weeks or longer to properly “cure” before sub­
jecting it to very heavy loads, such as tractors.

The wing walls, at the two ends of the culvert should
slope outward, as shown in the drawing. This will tend
to prevent water from seeping along the sides of the
structure, and undermining it.

No absolute estimate of the cost can be given, since
the gravel is a large item if it has to be bought, or hauled
a long distance. A culvert of this type, 24 feet long, was
built under the direction of a road overseer, by three men
in two days at a cost of $50.00 for materials.

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Cultivate as soon as you can follow the rows,
then--- cultivate some more

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There is imperative need for confidence in our govern­
ment. There can be no higher patriotism than co-opera­
tion toward the organisation and conservation of our na­
tional resources. Through it we can show the world that
an autocracy has no monopoly on thoroughness and effi­
ciency, inventiveness and ingenuity. Such an example
would be worth one hundred victories of our armed forces
on land and sea, and it would raise an impregnable ob­
stacle to future Kaiser-made wars.—(Extract from Editor­
ial of The Country Gentleman.)
EBFORE 1914 there were in Boulder county not over forty silos. The first of this year there were over two hundred. An increase of 400% in three years certainly shows that the silo is becoming more popular and profitable all the time.

The increase in the number of silos would no doubt go on just the same but this late spring may be the one deciding factor for the farmer who has been thinking about building a silo but who had not as yet fully decided on the size and kind.

The material from which a silo is built does not make much difference in the quality of the silage. Certain points are, however, worth keeping in mind. In the first place the silo must be air tight. The walls inside must be smooth. The round silo is the best type. As a silo has to stand much pressure it must be substantially built. A roof, while not essential, is desirable. The cost depends on the material used. For silos holding less than 100 tons the cost should be between $2 and $5 for each ton of capacity. The average cost per ton capacity in Colorado of 39 concrete silos built in 1912 was $2.48, according to data collected and compiled by W. A. Barr.

Concrete, cement staves, wood, and tile, in the order named are the most popular materials out of which silos have been built in Boulder county.

The capacity of various sized silos, together with the number of pounds which should be fed each day in order to remove about 2 inches of silage from the surface, may be seen in the following table:
The amount to be fed to various classes of livestock is here shown:

- **Dairy cows** .......... 25 to 40 lbs.
- **Stock cattle** .......... 25 to 40 lbs.
- **Fattening cattle** ........ 15 to 30 lbs.
- **Breeding ewes** ........ 3 to 5 lbs.
- **Fattening mature sheep** .. 3 to 4 lbs.
- **Fattening lambs** ........ 2 to 3 lbs.
- **Horses and mules (work stock)** .. 4 to 5 lbs.
- **Horses and mules (yearlings)** ... 8 to 10 lbs.
- **Horses and mules (mature, idle)** 20 to 40 lbs.

The figures given are taken from Bulletin 200 of the Colorado Agricultural Experiment Station.

From 10 to 13 tons of silage per acre of corn may be expected so it can be readily figured how many acres of corn to plant in order to get enough silage to fill the silo. The variety of corn is not so important. It should not, however, require too long a season to mature and should produce a large amount of both corn and fodder. It may be drilled or dropped in hills.

The advantages of silage are many. For milk production, when pasture is scarce, it has no equal. It keeps the bowels normal, the skin soft and pliant and the coat glossy.
It improves the ration by making it more palatable. It is a cheap roughage for lambs and makes cheap gains with beef cattle. There is no loss in feeding, the coarse stalk as well as the leaves are eaten. In dry climates about 50% of a crop is saved by field curing. The silo preserves about 90%. Also, the silo furnishes a convenient and compact method of storing.

A prominent silo building company asks this question: “If the farmer’s wife cans corn for the family, why shouldn’t the farmer can the cornfield for his stock? The answer is, “He should.”

Good Windbreak Pays Dividends

W. J. Morrill
Colorado Agricultural College

Windbreaks are usually more or less ornamental on a farm, and add to the contentment of the owner. But it is not generally known that windbreaks actually pay dividends. At least, studies made a few years ago in Nebraska and Kansas indicate that windbreaks are profitable. The state forester will soon study their influence in this state.

It must be admitted that windbreaks occupy space that could be profitably devoted to agriculture crops, and that the roots of the trees and their shade renders a strip of ground relatively unproductive. Yet in spite of these drawbacks, efficient windbreaks undoubtedly do more good than evil.

The windbreak reduces the velocity of the wind, and, therefore, the loss of soil water from evaporation from the soil surface and from the field crops. This is equivalent to additional rainfall, just as “a dollar saved is a dollar made.” It seems from investigations made by the United States forest service that greater yields of field crops and apples behind the protection of a good windbreak are enough to warrant every farmer in the prairie states in planting windbreaks.
A Record Breaking Herd

From "Herds and Flocks" of University of Missouri

GOOD example of what intelligent selection, keeping of records and systematic testing will accomplish is the dairy herd owned by the Missouri College of Agriculture.

The following account taken from "Herds and Flocks," published by the department of Animal Husbandry of the college, gives the history and performance of this herd:

"The dairy herd numbers 103 head, among which are 44 Holsteins, 33 Jerseys, 18 Ayrshires, and 7 Dairy Shorthorns.

"The policy has been to buy a few foundation cows and breed a herd from these. The Jersey herd was started in 1887 with four cows. The Holsteins are descended from four cows bought in 1902, the Ayrshires from three cows bought in 1907, and the Dairy Shorthorns from three cows bought in 1907. These are the only females that have been brought into the herd.

"Five Holstein cows in one year produced 101,612 pounds of milk and 3,879 pounds of butter, an average of 20,322 pounds of milk and 776 pounds of butter each. Two of these have produced over 900 pounds of butter each in a year, and one has over 20,000 pounds of milk a year to her credit three years in succession. What such a production means may be better understood by stating that each of these five cows produced 9,670 quarts during the year or an average of 27 quarts a day. Had this been sold at eight cents a quart, the income would have been $773 a cow.

"The average cow in Missouri produces about 4,000 pounds of milk yearly. A herd of twenty-five average cows would be required to equal these five Holsteins in milk production. To raise a calf in good condition re-
quires about 2,500 pounds of skim milk. Each of these cows could have raised eight good calves.

“One of the five has had seven calves. Of these five were bulls and sold for a total of $1,500 cash at ages less than 8 months. Their mother has averaged over 15,000 pounds of milk a year.

“In 1902, the University purchased four Holstein heifers as a foundation for a herd of that breed at a cost of $600. Not a single female has been purchased since. One of the four cows had a bull calf and, as the cow was inferior, both cow and calf were sold. The entire University Holstein herd is descended from these three cows. Up to the present, stock has been sold for a total of $7,383 cash and forty-three head of females are now on hand with an inventory value of over $14,000. The investment of $600 thirteen years ago has resulted in an income of over ten times the original cost, and the development of a herd worth over $14,000.

“In the Jersey herd, six have produced over 700 pounds of butter and eleven over 600 pounds of butter apiece in one year. As the average cow milked in Missouri produces 140 pounds of butter yearly, it would require a herd of forty-seven such animals to equal these eleven.

“Three Jerseys have recently completed a lifetime of service after producing a total of 326,165 pounds of milk and 17,545 pounds of butter, an average of 5,848 pounds of butter each. Every pound of milk yielded by these animals has been weighed and recorded.

“Three Shorthorns have produced 12,000 pounds of milk in one year. One of these, Lula, for some time held the highest milk and butter record for the Shorthorn breed.

“Two Ayrshires have produced over 500, and several over 450 pounds of butter in one year.

“Since 1892, each milking of every cow has been weighed and recorded. Each month a five-day sample is taken for each cow and this is tested for butterfat. The records are all kept and are used for instruction.
The entire herd has been given the tuberculin test each spring for ten years. The general plan is to raise all the heifers and keep them until milk records are on hand for at least two years, in order that records may be available from which to study breeding.

The man chiefly responsible for the high efficiency of this dairy herd is Professor C. H. Eckles. His book, "Dairy Cattle and Milk Production," is recognized the world over as an authority on dairying and deserves a place in the home of every farmer who has any milk cows.

Use and Abuse of Harrow

From "The Agricultural Review"

Address of Hon. W. R. Motherwell, Minister of Agriculture of the Province of Saskatchewan, Canada, before the Tenth International Dry-Farming Congress

The harrow is frequently the least understood and the most despised tool on the farm. Harrowing is usually delegated to the cull team and also to the cull driver, in consequence of which cull results are naturally often obtained. Notwithstanding this, the usefulness of the harrow has been demonstrated on almost every kind of soil, and at all periods of the growing season. That its usefulness was appreciated in Shakespeare's time may be gleaned from those lines in Richard II:

"I will go root away
The noisome weeds, that without profit suck
The soil's fertility."

It is even made mention of in holy writ. In rebuking Job, the Lord said: "Canst thou bind the unicorn with his band in the furrow? or will he harrow the valleys after thee?"

However, since only the lighter soils were cultivated in ancient times, the harrow often consisted of bushes or branches of trees, which merely scratched the surface of
the ground. Even today, in some of the more remote parts of Europe, the peasants use a brush harrow of this sort. The march of progress does not halt for the remote districts to fall in line, and we find that the old “A” harrow, which originally consisted of thorn bushes with a cross-arm attached, was improved upon by the Romans who devised, a square or oblong harrow made with cross-bars and provided with numerous teeth. This remained the standard type until late in the sixteenth century. Since then the harrow, in its course of development has consisted of a wooden frame with wooden teeth, a wooden

Your personal supervision of the thinning helps you and helps the thinners

frame with iron teeth, or wholly of iron. The second type is still in use to a considerable extent, but iron harrows are now mostly employed. Of a very different character is the chain harrow, which consists of a collection of iron rings, and the disc and acme harrow with which we are all familiar.

The Uses of the Harrow.

In dry-farming practice probably no other implement plays so important a part in moisture conservation as does the drag harrow. Practically all plowing except sod should be harrowed immediately after or better still at the same operation and thereby save large quantities of water that would otherwise be wasted by evaporation. If we did not have the harrow the much talked of “soil mulch” would be very hard to obtain. There are other implements on the farm which we could use to produce this mulch, but the small acreage covered by them in a day makes the cost of production so great that their use is prohibitive. The two outstanding features of the harrow in producing or restoring a mulch are the rapidity with which the work can be accomplished and the efficiency of the work done.

Not only is the harrow a splendid implement to use in
producing a mulch, but it is beneficial also as a packer. In newly plowed land especially, the harrow teeth go well into the ground, breaking up the lumps right through the furrow slice, compacting the soil and thus materially aiding the capillary action of the soil moisture.

For every pound of dry matter produced in a plant, from four hundred to seven hundred pounds of water are absorbed. Experiments have proven that a single stroke of the harrow has checked evaporation to the extent of one hundred tons of water per acre. This is approximately equivalent to an additional yield of four bushels of wheat to the acre.

The ordinary iron or wooden drag harrow should be and is usually constructed so as to avoid the teeth tracking. This is best accomplished when only one place is provided for attaching the whiffle-trees. In the case of a four-horse harrow with two hitches provided on one long evener, careless driving or one team habitually slower than the other, may result in these teeth tracking continually, which is not harrowing at all.

A much better arrangement than the usual long heavy evener, or say a six-section harrow with two horses hitched near each end, or better even than having the four horses hitched to the middle of a long evener, is the one which I shall endeavor to describe. The six-section harrow should consist of two complete harrows each three sections wide, each drawn from a light evener wide enough for three sections. To each evener is attached a set of two-horse whiffle-trees. The inner sections of the combined two sets of harrows can be kept the proper distance from each other by first running the four evener attachment links for the two inside sections, through a piece of hardwood 2x4 and four feet long, in which the necessary holes have been made to allow the links to pass through easily and work freely. This keeps the two three-section harrows in position just as well as the one long heavy evener and does not cause the front of the harrow to dig so deeply into the soil, which is much to be avoided in harrowing soil with much top litter or other refuse in it.
Preparation of a Seedbed.

In the spring when every farmer is anxious to commence seeding, the harrow is most essential. As soon as the land is in a reasonably friable condition it should be harrowed, which operation will form a mulch and thereby check the rapid evaporation that is always going on in the spring. Sometimes the spring opens up several weeks before it is advisable to start seeding. Early in this interim it is particularly desirable to harrow the land to be sown a short time later, thus preventing the escape of large quantities of water that would be lost by evaporation in the meantime. By checking the evaporation, harrowing is an important factor in warming up the soil and preparing it for the seed, as every pound of water we see rising in vapor from the surface represents a loss of heat from the soil. After the seed has been sown, the value of the harrow can once more be demonstrated behind the seed drill, thereby putting, not only the proper finishing touch on the field, but also putting it in better shape for successful harrowing after the crop is above ground.

Weed Destruction.

As a weed eradicator the harrow is indispensable, but when it is to be used for weed destruction the weeds should never be allowed to get beyond their seed leaves. When the weeds are at this stage on a warm, dry day, the harrow will kill millions of them. In summer fallowing, from the time the land is shallow plowed or double-disced the previous fall until freezeup the season it is fallowed, the harrow can be used at intervals to good advantage for accomplishing the following purposes: Killing weeds, conserving moisture, making a firm seedbed, stirring up the surface of the ground and permitting access of proper amounts of air, thus giving the soil bacteria an opportunity to change the plant food from an unavailable to an available condition.

Many authorities recommend harrowing fallow of summer tilled land as soon as possible after every considerable rain. This is not always practical in wet, cloudy weather, nor desirable in the case of weedy land, where a much more complete germination of weed seeds can be secured.
in the top soil by letting it remain wet to the surface for three or four days after a rain. This encourages the fullest possible germination of weed seeds which may then be destroyed by the same harrowing that restores the soil mulch and with no appreciable loss of moisture in the meantime.

If the top soil to the depth of the usual mulch—say one and one-half inches—is kept continually stirred and dry by the harrow, no weed seeds in that layer of soil can germinate, but remain there to cause mischief later on. In many older districts and countries the practice of harrowing the growing crop is followed with excellent results, as in fields where annual weeds are troublesome the crop has often owed its salvation to the fact that it was harrowed after it was above ground.

Harrowing winter grains during the following spring is now a recognized practice in those portions of America and elsewhere, but it took long years to establish the custom because of fear lest the grain be maltreated or partially destroyed by the operation. Harrowing spring crops may be practiced with equally good results if certain precautions be taken. That French Weed or Stink Weed, one of the worst annual or winter annual weeds with which the Saskatchewan prairie farmer has to contend, can be controlled by the timely use of the harrow is now a matter of history in many of the older districts of the Canadian West.

The methods to employ and precautions to take in harrowing spring grain crops depend in some measure on the primary object that induces one to harrow grain. If a field is to be harrowed for the purpose of restoring a soil mulch and stimulating growth, then it should be done at a time and by such means as will do the least possible damage to the young grain plants. It is generally conceded that the best time to effect this is just before the grain is showing above the ground and again when the plants are four or five inches high, or about meeting in the rows. A light wooden harrow with round teeth is preferred in such instances, and care should be taken not to have a lot of
rubbish on the top of the ground to drag on the harrow teeth and mess up the young crop.

If, on the other hand, harrowing grain is contemplated primarily to destroy young weeds which, if permitted to remain, will often take such a terrible toll of the crop, then the harrowing is best performed (weather permitting) when the young weeds are small and tender and not yet out of their seed leaves, regardless, to a large extent at least, of the stage the young crop is in. To do this successfully and not retard maturity by thinning out the crop, it will be necessary to sow a little heavier to allow for the destruction of some plants. The harrow best adapted for killing weeds in growing crop is the one that is sufficiently heavy and close cutting to kill the weeds and at the same time do the minimum damage to the crop.

A high-framed long toothed harrow with abundance of clearance and teeth that will not track is the one that usually best fills the bill in such cases.

There is still abundant opportunity for the inventive mind to get out a much better drag harrow than has yet been seen on the market. It is to be hoped that the growing popularity and importance of harrowing young crops of growing grain will speedily produce the mind and the man with sufficient inventive genius to supply this much required want.

**The Abuses of the Harrow**

Damage is often done to growing crops by harrowing when the leaves are wet and full of water as they are more crisp and tender at this time than on a warm dry day. This is especially so in harrowing a corn crop. Also, if the land is wet the harrow teeth will gather soil and rubbish and pull out considerable grain. If harrowing is done when the ground is too loose, a great deal of the grain may be pulled out or covered, with consequent loss to the farmer.
Harrowing the land in puddled condition: By harrowing the soil when it is very wet, its physical condition is seriously impaired and it is difficult to restore the land to a friable granular state. If the soil is puddled and the granules broken down, then the surface films of moisture on the smaller soil grains come so nearly in complete contact that there is scant room for air to circulate and plants cannot thrive. Soil bacteria of the aerobic kind are thus rendered useless. This is especially so in clay soils where the soil particles are of very minute dimensions.

Excessive harrowing is very detrimental in districts where the soil lacks fibre and is liable to drift. Many industrious farmers are led astray by the term “dust blanket.” This may be suitable in some parts, but should be changed to “earth blanket,” as many people in harrowing their land work diligently to produce a dust covering, and the result is that with high winds the whole mulch drifts off. When a soil mulch is well loosened and thoroughly separated from the firm ground beneath, and especially after mulch has become dry, little benefit can be gained by harrowing unless there are weeds to destroy.

Again, as previously mentioned, excessive harrowing of weedy soil immediately after rain tends to prevent weed germination in the surface soil by keeping it constantly dry and loose. It is important to avoid this.

A harrow to conserve moisture and destroy weeds in growing crops:
Must be light.
Must have good clearance.
Must have closely set long teeth that will not track. It can only be used to advantage:
On a dry or warm day.
On a soil that works freely.
On small and lightly rooted weeds.
On annual and winter annual weeds.
On soil that is firm beneath the mulch.
Or when thicker seeding is practiced to allow for what is pulled out.
It cannot be used to advantage:
On wet soil.
On perennial weeds.
On a short toothed harrow that clogs.
Or by a man on a harrow cart.
Finally, our best farmers and observers now contend that next to plowing, harrowing is the most important field operation on the farm.

Some Good Advice, Right Off the Ice, For Dodging Foodstuffs' Awful Price

W. E. Vaplon
Colorado Agricultural College

It makes the grocer laugh out loud to see the foolish, hungry crowd step up and buy his tin can beans with money fished from faded jeans. He smiles to see how keen they be to buy the stuff that's often tough, and stingy, stale, just good enough for thriftless folks to buy and eat; but not as good by fourteen miles as stuff that mother canned in piles. We've left the good old-fashioned way of fixing for a rainy day by canning corn and peas and beets and other things that's good for eats. We used to like to turn the soil, we used to exercise in toil, to pull the weeds on hands and knees and feed the chickens and the bees. To plant the radishes and peas was our delight, but now we scoff at honest toil and play at golf or jump into our rusty car and hit the highway with a jar; we spend our wages to buy gas instead of raising garden sass. No longer is the cellar filled with kraut and lard, and pickles dilled, with spuds and eggs, preserves and jam, and bacon, sausage, pork and ham. The moral is not hard to find, unless you are both deaf and blind. Just buy your wife some garden seeds, some modern tools to dig the weeds. Send to your college for the rules for canning stuff from squash to mules.
What to Do if Black Stem Blight Hits Your Alfalfa

The following, from a letter by County Agriculturist H. H. Simpson, of Boulder County, to the farmers of his district, will be of interest to growers of alfalfa all over Colorado. Mr. Simpson refers to black stem blight and has been assisted in reaching his conclusions on the subject by Prof. W. G. Sackett, bacteriologist, of the Colorado Agricultural College:

"Last year your attention was called to the presence of black stem blight and many farmers cut their fields, which stopped the further development and allowed the plants to start new shoots immediately. Those who cut early report very good later cuttings and some got three good crops for the season following this early clipping.

"If your alfalfa appears to have a touch of frost or to be suffering from too much or too little water, examine it carefully, for the chances are that it is this disease. True frost damage has more of a white to a light straw color, and is usually on top of the plant. It is true that many of our fields have been injured by frost and some are getting dry, but blight is really doing the great damage, and farmers should not deceive themselves in believing it is something else. The sooner we face the situation as it is, the less will be the drain on your farm income.

"Prompt action must be taken in order to prevent damage to the alfalfa and in order to secure a good yield this year. Past experience has shown that the only safe method is to go in at once and cut the alfalfa. This will result in the starting of the next crop at once and if this is done promptly, we may still get three cuttings. All growth in the diseased stems stops and nothing is gained by leaving a field stand. Cutting at once may also prevent the disease going into the crown, which usually results in the death of the plant within a year or two."
HERE is some hysterical talk concerning the danger of a food shortage in this country similar to that experienced in other countries at war. A little sober reflection, however, will show us how little ground there is for such fears, provided our production is pushed to the maximum and distribution is organized to stop food wastes in marketing.

The heart of America contains the richest developed area of crop-producing land in the world. It has been pointed out that one farmer on our fertile prairies could provide the food for 100 people for a year. We have in the Central States about two million farms, which at this rate of production could produce food for all our people and have a lot to spare.

Our farms have always provided an ample supply for our people. This is apparently contrary to some of the statements that production has not kept pace with population, but the fact is that while in 1899 our farms furnished 3.6 bushels of potatoes per capita they furnished 3.5 bushels in 1915, when there was a short crop. Of all grains they furnished 44 bushels per capita in 1899 and 40 in 1915. In 1899 we produced only 6.4 pounds of sugar per capita, in 1915, 19.5 pounds. In 1899 we produced 248 pounds of meat per capita, in 1915, 220 pounds. Of eggs there were seventeen dozen in the first period and 18 dozen in 1915.

Our acres are ready to meet almost any demand upon them. They more than suffice for our home consumption and if they are properly tilled they will assure our being able to help feed other nations. Our place in the sun as the richest nation in the world is buttressed by the fact
that we have potentially the greatest food supply in the world. But this food supply depends upon every farmer's increasing his marketable surplus through better farming. This is not only to save our nation but to enable this nation to save the world from autocracy.

---

Do not allow your beets to get too large before being thinned

---

The Imperishable Tractor

(From the "Country Gentleman")

A traveler who recently visited many farms in the Northwest remarked on his return home that he had noticed a great many tractors "kicking around" fence corners without shelter or covering.

"What's the matter with the tractors—won't they run?" the traveler was asked.

Nothing whatever is the matter with the tractors," he replied. "The chief trouble is with the owners. They allow their tractors to lie around any-old-where, exposed to the elements, just as they do their plows, rakes, harrows and other implements."

To call this sort of neglect folly or stupidity is to state the case mildly. The farmer who fails to discriminate between the imperishability of a crowbar and of a tractor certainly needs a mental jolt. He is more than likely to get one. Vastly more than any other farm implement the tractor should be sheltered or covered to arrest depreciation and disintegration. A winter in the open will put
more kinks into the very best tractor than will a year of hard usage.

Now, while the farmer is for the most part to blame for this sort of neglect a specific degree of guilt rests on the shoulders of a certain class of tractor salesmen who make extravagant claims concerning the imperishable qualities of a tractor.

If a possible purchaser hangs back because he has no shed for a tractor, doesn’t want to take the time or spend the money to build one, and doesn’t want to be bothered wrapping up and covering up the machine, the too eager salesman will retort:

“Shucks, man, don’t let that worry you. Our machine is built of the very best iron and steel. A winter in the open won’t hurt it any more than the weather will injure an iron wedge.”

The tractor salesman guilty of this selling argument should certainly be muzzled or kicked out of the selling force by the manufacturer. He is doing incalculable injury to the entire tractor industry. Real tractor efficiency depends eighty per cent upon intelligent use and care. To encourage stupid neglect is simply to sow the wind. The manufacturer is bound to reap a storm of abuse and complaint.
THROUGH
THE
LEAVES

JUNE, 1917
Published Monthly by
THE GREAT WESTERN SUGAR CO.
Longmont Factory
Mailed Free to all our Growers
To others 10c each

DAILY CALL PRESS
LONGMONT, COLORADO
1917
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Cattle Being Fed on Ray Reynolds Farm
DURING the past few days the cultivation and thinning of beets has been going on very generally. With so much cold, damp weather it is very necessary that the ground be stirred as soon and as thoroughly as possible to let air in to the roots of the plants. Nothing you can do will so quickly check black-root as thorough cultivation.

We also want to urge that you give your labor all the advantage possible by starting the thinning while the beets are small. Our labor requirements are pretty well taken care of now, but warm weather is going to make a rapid growth and a little crowding at the beginning is better than to have to crowd the work after the beets get large.

The stand of beets this spring is generally very good indeed. There are a few exceptions and in a great majority of these exceptions the cause is too deep planting. With cold damp weather the little plants have a hard time to force their way through a couple of inches or more of cold soil. More and more are we convinced that 1½ inches should be the maximum depth.

Our fieldmen are co-operating with Mr. Simpson's labor bureau. If you are in need of help they will gladly do what they can to put you in touch with any parties who may be looking for work.

In this connection we wonder how many of the growers realize what it means to Northern Colorado to have all
of this beet labor to draw from for their other farm crops. Even with all this help there is often a shortage and we can realize a little of what other districts are up against that do not have this beet labor available.

As we meet the various farmers, we do not find any who are not putting forth a special effort to increase their production this year. Certainly the confidence of the government in the American farmer is well founded and when the harvest is over the results will be fully up to expectations.

+ + + +

Elsewhere in an article on "Permanent Prosperity" Mr. Williams quotes from Mr. Clarence Ousley. The following is also from Mr. Ousley and gives us much food for thought. He says: "What right have we to boast of the fertility of our soil if we do not hand it down as fertile as we received it? You cannot build up a great people, a great commonwealth, you cannot maintain this republic unless you make sure of its foundation in the fertility of the soil and the prosperity of the people."

Deep Cultivation between the rows the first time makes the other cultivations easier

HOE FOR UNCLE SAM

"HO, FOR GOOD OLD UNCLE SAM!"
And "HO, FOR THE U. S. A.!
These words we hear on every side,
We hear them every day.
But words alone will not do much;
Let each help all he can;
Get out your little garden tools
And HOE FOR UNCLE SAM! --Clipt.
One Year's Feed

H. Mendelson

Most people handling farm animals have some idea what the animal gets each day. Very few have a correct idea what it costs to maintain an animal one year. On a considerable number of farms this spring the work could not be done properly because not sufficient feed was available, hay and oats having been sold in excess of the requirements.

Horses

A horse with moderate work will need, per 1000 lbs. of live weight, per day, about---

20 lbs. alfalfa
10 lbs. oats.

If the horse is aged and has not good teeth, 15 lbs. alfalfa and 15 lbs. oats are better. In fact, while heavy work is performed it is better to give relatively more grain than hay. Therefore a sound 1500 lb. horse will need---

30 lbs. of alfalfa
15 lbs. of oats per day.

On well managed beet farms there is 150 days' work for each horse per year, during which grain is fed. This means---

4500 lbs. alfalfa
2250 lbs. oats.

During another 150 days, the same amount of hay is eaten, meaning another 4500 lbs. We may assume that during 65 winter days the horse is pastured. Therefore, the annual requirements of a 1500 lb. horse are---

9000 lbs. alfalfa, 4.5 tons.
2250 lbs. oats.

This is about 1.5 acres alfalfa
and a little more than 1.0 acre oats.

2.5

A farmer who takes pride in the appearance of his horses
and wants to get the most work out of them probably will feed more grain. Horses also often waste part of the alfalfa if the hay is not very good. Therefore, the estimate given above is rather conservative for a 1500 lb. horse.

An 80 acre beet farm will require at least four good horses, probably four heavy horses and two lighter ones. If the oats are raised on the farm we need—

from 6-8 acres alfalfa
4-5 acres oats,

or from 10-13 acres produce which cannot be sold.

Merely cutting down the feed is bad economy. An improperly fed horse cannot perform as much work as one properly fed.

A horse with bad teeth will swallow a great deal of feed, but part of the oats are not chewed and pass out in the manure, furnishing the main sustenance of many a flock of chickens.

Quite a number of good farmers who feed sheep or steers every year prefer to buy wild hay for the horses and feed the alfalfa to other stock. This looks like an expensive method, but those practicing it stick to it every year and claim they get sufficiently more work out of the horses and enough more value out of the alfalfa to compensate for the extra cost of the wild hay.

**Milk Cows**

A good Holstein cow producing 7000 lbs. of milk, if fed on alfalfa, silage and barley, will need per year about—

- 7000 lbs. alfalfa equals 1.15 acres
- 11000 lbs. silage equals 0.70 acres
- 1750 lbs. barley equals 1.00 acres

Total 2.85 acres

Presumably some concentrate, like bran or cottonseed, could be bought to advantage, decreasing the amount of hay and grain necessary. A rough estimate would be that 1 lb. cottonseed equals 1.5 lbs. bran or 3 lbs. good hay.

If beet tops are properly fed, an acre would give the
equivalent of about 130 days' silage. This would necessitate 7050 lbs. silage or about 0.44 acres corn silage with a yield of 8 tons per acre. Of course the better the yield the less acreage is required, and the more cows can be fed on the same acreage.

It is also not necessarily the best practice to raise food like barley. It might be better practice to raise wheat and buy the barley. The annual consumption is based on a raily ration of about---

15 lbs. hay
30 lbs. silage
5-6 lbs. grain during milking period of 300 days.

**Beef Cows**

In the corn belt where the yield of silage on good farms is naturally higher than at our altitude with our shorter and colder growing season, beef cows are wintered on 3.5 tons silage equal to one-third to one-fourth of an acre and from .5-0.25 tons of hay. Cows obtaining 30 lbs. of silage and 5 lbs. clover or alfalfa hay per day gained well while in open feed yards. However, the minimum annual requirements of a beef cow are certainly not less than those of the milk cow, except the grain. Therefore, with our yields of corn silage and alfalfa, the requirements would be---

1.15 acres alfalfa
0.70 acres silage

Total 1.85 acres

The only salable output of these 1.85 acres would be a calf two to three months old. Unless you keep the calf and feed it to maturity at a good price, this does not look very promising for keeping beef cows on the farm without cheap pasture, either beet tops or some other.

**One Man**

We know by this time almost as much about the food requirements of a man as about those of horses, cows and sows.
According to the standard of the United States army, one man in peace times requires, per pay—

about 4 ounces of digestible protein
about 5.5 ounces of digestible fat
about 15.7 ounces of digestible carbohydrates, meaning mainly starch and sugar.

The writer never has seen a soldier in peace times, who could not eat a steak or several doses of ice cream a day, besides what Uncle Sam furnishes. When serving in the Colorado militia during the strike at Cripple Creek, although everything furnished was first rate, most soldiers bought candy regularly in addition to the seemingly ample ration.

If a man could live by bread alone, the above requirements would be filled by about 3.1 pounds of bread per day or about 1130 lbs. per year, or about 800 lbs. of flour. This at present milling standards equals about 1100-1200 lbs. of wheat. The average yield per acre of wheat in the United States is around 15 bushels or 900 lbs. Therefore, if nothing but bread were eaten it takes about 1.3 acres of average wheat to maintain one man one year.

If a man lived on nothing but bananas, he would have to eat about 14 lbs. per day to get enough carbohydrates and would then have a great deficiency of protein.

Twelve pints of milk per day would also fill the above requirements approximately, but there would be relatively too much protein and too much swallowing.

If the diet is composed of common staple articles, the following would fill approximately the army requirements, furnishing a little more protein than called for, but the normal amount of fat, starch and sugar---

200 lbs. flour
1100 lbs. milk (one pint each meal)
100 lbs. sugar
25 lbs. butter
150 lbs. beef
50 lbs. bacon
150 lbs. potatoes
20 lbs. dry beans
50 lbs. eggs (about 365 eggs)
150 lbs. various vegetables and fruit.
When digging trenches or shoveling beets at the rate of 30 tons per day, the requirements are about 25% more.

It must be kept in mind that such feeding standards for men and beast are based on average requirements. One individual may require considerably more or less.

While one can foretell with considerable accuracy what 10,000 men or 10,000 steers will require, each individual bunch will require different quantities, and different qualities. Feeding men and beasts well is therefore not only a science or a business, but an art as well.

This is the reason that cooking like mother used to do has never been surpassed except by our wives.

Then Cultivate Again

Care of the Hoof

Geo. Knutson

GREAT many of our colts are not given the proper care as to their feet. With a little care a hoof that has a tendency to weaken can be made into a strong one by proper culture.

Often times crooked legs, sprung knees, etc., are caused by the feet not having had the proper preliminary training. The colt should be taken up at least once a month. Pare the hoof so as to make a good round sole, leaving the bars of the hoof a little higher than the frog. Give plenty of room for frog expansion. The frog is the cushion of the foot and is so placed that it takes up the severest part of the shock in placing the hoof on the ground. Be on the lookout for stones, nails and other foreign matter between the bar and the frog. Let the colts run on soft meadows as much as possible as this spreads the hoof and keeps them in good growing condition.
Sugar Company's Good Roads Truck and Grader
Co-Operative Road Building

S. M. Edgell
(Vice President Great Western Sugar Company)

It has occurred to me that your readers might be interested to hear briefly of what this company, co-operating with the various counties in which it operates, is doing toward the construction, improvement and maintenance of roads. I was impressed by the good sense of Mr. Jarrell's article in the May number of "Through the Leaves," and the truthfulness of his statement that the condition of the roads in a community reflects the prosperity and progressiveness of the locality. I think that a general discussion and interchange of views, on the part of the readers of "Through the Leaves," with reference to the most practical way of supervising the construction and upkeep of roads would be valuable and instructive. It is not difficult to plan the construction of a road, estimate its cost, and provide necessary appropriations for the work, but it is difficult to provide for economical and systematic dragging and maintenance of the road after it is built. I venture to say that more money is wasted on improper maintenance of roads than is spent on their construction. This one topic, "Maintenance of Roads," eliminating all discussions referring to their construction or repairs after they are run down can, and should be, made the subject for much beneficial discussion.

This company has shared for the past three years in road work throughout various counties in Colorado, Nebraska and Montana. This year it is extending its field into Wyoming. The general procedure is as follows:

Each winter the Board of Directors sets aside a definite sum of money, which is placed in a good roads fund. It also appoints a committee to supervise the economical and efficient expenditure of this fund. After the fund has
One of the Finished Roads
been established (and this year the amount authorized was increased by 50% over the amount authorized last year), the committee writes to the local managers of the various factories asking them to submit to it their requirements, and the amount of money which can be judiciously expended from this fund in the territory in which they operate.

Before any money is allowed, two fundamental rules, which were arbitrarily adopted by the committee, must be agreed to. The first is that no money of this fund shall be spent on any road that does not directly benefit beet growers. In other words, none shall be used on any road over which beets are not hauled. The second is that money from the fund shall only be spent in co-operation with more money to be spent by the counties. In other words, the committee feels that road funds levied by the counties, should be spent in conjunction with the road fund contributed by the Sugar company, either dollar for dollar, dollar for two dollars, or more, as the individual cases and necessities may be. Thus the county which most generally spends its money with the company's, gets more of the company's money to spend, and the county which contributes less generously, gets less, and so on.

After taking into consideration these two fundamental principles, the managers send the committee reports showing the number of miles of road upon which they wish to apply the available funds, segregated according to the description of each road, the number of tons of beets hauled over it, the length of gravel haul, the yards of gravel required, estimated price of gravel, cost of grading and packing, maintenance and incidentals. These figures are then totalled, showing what the entire cost of each road will be, and the total is then divided, showing what portion of the amount is to be borne by the county, and what portion by the Sugar company. After these reports have been received from all the managers, they are totalled to see
whether or not the amounts asked for are within the amount of the road fund as originally set aside. If there is sufficient money available to meet the requested appropriations, authority is given to proceed with the work as outlined, though in all cases where it is possible, and in those cases where there may be some doubt as to the advisability of spending part of the fund on certain roads, one or more members of the committee try to go over the ground with the local manager. When the work is finally authorized, it is generally done by the counties, the Sugar company contributing its share at such times as statements are received from the counties. Thus it is the company’s policy not to interfere in any way with the counties’ methods of handling their road work, merely co-operating with them in determining which beet roads require the most urgent attention, and then contributing directly to the counties their share of the amount required to put them in shape.

Last year more than 130 miles of road were put in good condition. In one county alone, sixty miles of road were either built or put in first-class repair, every mile being graded, crowned and surfaced with gravel. The average cost for this particular county’s work was $415.00 per mile, of which the county spent at the rate of about $245.00 per mile, and the Sugar company at the rate of about $170.00 per mile. It would be difficult to find better country roads than exist in this county, as the accompanying photograph shows, and when one considers that this can be done at a cost of only $400.00 or so per mile, plus systematic, annual maintenance, amounting to but a few dollars more, it is difficult to think of any better way to spend this amount of money.

This year this same county expects to spend in co-operation with the Sugar company about $45000.00 on its beet roads, and will apportion it in a way similar to last year: Of this amount the county will contribute $30000.00, and the Sugar company $15000.00.

It is estimated that this amount will grade 75 miles of road, and build 71 miles of new road. By building new road it is not meant that entirely new roads will be opened
up, but it merely means that these 71 miles are in such bad shape that they must be plowed up and completely renewed. In addition to the above, this sum includes $5,000.00 for systematic dragging of the roads. This money will provide for the dragging of 136 miles of road, on an average of twice a week for seven months, based on an estimate that this work will require six teams at a monthly expense of $720.00. Of course these figures represent averages only, for the ability to drag roads usefully depends almost entirely on weather conditions, but at such times as dragging the roads is not practical, the teams can be used to advantage in hauling gravel and making minor repairs.

It is the opinion of the writer that this provision for systematic dragging of the roads is the most important part of the whole scheme of work. It is often the custom, however unintentional, to put roads in good repair and then allow them to remain untouched until they eventually go to pieces; whereas by judicious dragging and systematic attention at a nominal cost they can be made to last indefinitely.

Various systems are in usage providing for the dragging of county roads. The one most generally adopted is an arrangement made by the counties with various farmers, by which the latter agree, and are paid to keep certain roads dragged adjacent to their farms. This system is theoretically all right, and it should be economical, but in practice it very often fails, for roads can only be economically dragged during a limited period after storms, when moisture conditions are just right, and frequently the farmer, whose duty it is to attend to certain specified roads, has something of importance that must be attended to in connection with his farm, just at the time when it is proper to drag the roads. It is unreasonable to suppose that he neglects his farm to attend to the roads. None of us would
do it. Therefore, in such cases (and this happens more frequently than is commonly supposed) the road is neglected just at that time when attention is most needed.

The best scheme for systematic dragging seems to the writer to be that in operation in the county referred to above. A definite sum is set aside for dragging a definite number of miles of road an average number of times a month. Men and teams are hired for this express purpose and do nothing else. Of course, to result in economy, these teams must be kept constantly busy, so when the condition of the roads does not justify dragging, they are kept busy in making minor repairs, hauling gravel, and in generally keeping the roads in shape. This system may cost more than the other, but it is efficient and produces results, and in the long run it is doubtful whether it is more expensive, for increased efficiency will decrease cost. Whether or not it is more expensive, or whether or not other and better methods can be devised to accomplish the same result, can be made a topic for discussion of which I trust the readers of this paper may avail themselves. At any rate, MAINTENANCE is the word that means more in good roads than all else put together. And as a rule, maintenance is the least efficiently provided for, and often not provided for at all. It is gradually becoming the rule of the company's Good Roads committee not to authorize contribution toward any road unless it is first satisfied that adequate provision has been made to maintain the road after it has been put in good condition.
Beet Top Silage

R. C. Kibbey
(of American Beet Sugar Company)

As far as we know at present there is no way in which greater profit can be realized from beet tops than by siloing them and feeding them during the winter to fattening cattle and young stock, dairy cows and sheep. In Germany and several of the older beet growing sections of Europe, this method has been successfully followed for a great many years.

The cost of siloing tops is comparatively slight, ranging, under ordinary circumstances, from $1.25 to $2.00 per ton. This includes the initial cost of excavating the silo, the value of the tops, straw and salt used, and the cost of hauling to the silo and filling.

By siloing the tops, not only they themselves but also the straw is made very palatable to stock, and as this mixture comes out of the silo warm, cattle will eat it greedily. Practically none of the food value is lost and the fermenting process destroys the beet disease-producing organisms so there is no danger of infecting fields by spreading manure from cattle fed on this silage.

Location.

The silo should be dug on some well drained spot, close to the feed lots, and the ground should slope away from it in all directions so that surface water will not run into the pit.

Construction.

A satisfactory sized silo is one excavated to about 5 ft. in depth, 8 to 12 ft. in width at the bottom, the top width being just enough greater to give the sides whatever slant is required to prevent the earth from rolling back in while the silo is being dug. The bottom should have sufficient slant to drain off well, if it is not porous.

Most of the excavation work can be done most econ-
omically with a scoop. The two ends should be so graded that the wagons can be driven right through the silo.

**Preparation of Tops.**

The best results are obtained by putting the tops in the silo promptly, not to exceed two days after they are topped. It is important to have the tops as free from dirt as possible, and care should be taken in picking up the tops to shake off all the dirt.

**Filling the Silo.**

The essential point in preserving the tops is in thoroughly packing them, in order to effectively keep out air. This is especially true of the edges where the tops come in contact with the walls, so that no air can enter from this quarter.

It is advisable to put a 4-inch layer of straw on the bottom of the silo, to keep the tops from coming in contact with the ground, and a slight sprinkling of straw can also be put on the sloping sides to keep the tops from coming in contact with the soil. On top of the layer of straw, place a 6-inch layer of beet tops, then about 3 inches of straw and so on, alternating the layers until the pile is about 3 or 4 feet above the ground. The palatability is improved by scattering salt over each layer of tops at the rate of 3 pounds of salt to the ton of tops.

**General.**

In filling the silo, special care should be exercised to pack the tops and straw thoroughly to exclude the air. This may be done by use of a horse, mules, or land roller. In filling the pit, the wagonload of tops or straw may be passed directly over the previous filling in the pit.

The silo need not all be filled at once, but extra layers can be added each day, care being taken to make a complete layer of the tops each day, and then putting on a layer of straw the same day. The filling may be continued during the whole topping season. The last layer on the silo should be straw, and on top of this about 1 foot of...
earth should be put, in order to weight down the contents and to exclude the air. No water should be put in the silo, as there is plenty of moisture in the tops.

From four to six weeks are required before the silage is in good condition.

A bunch of 135 head of steers was bought in Denver October 24th, at an average weight of 958 lbs. and was sold in Kansas City, a carload at a time, as fast as they were finished. The average feeding period was 115 days and the average daily gain for the entire period, from the time they were bought until they were sold at Kansas City, shrink included, was 2.3 lbs.

These cattle were first pastured on beet tops, then fed wet beet pulp, refuse molasses, alfalfa hay and cottonseed cake, increasing amounts until December 16th, when put on a full feed of the following ration:

- 3 lbs. cottoncake
- 4 lbs. refuse molasses.
- 25 lbs. beet top silage.
- 60 lbs. beet pulp.
- 10 lbs. hay.

This ration is for a quick feed of about 100 days. The ration may be changed to suit feed available, increasing the beet top silage to 60 lbs.

Dirt Pit, Beet Top Silage.

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<th>Percentage</th>
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<tr>
<td>Green beet tops</td>
<td>205</td>
<td>95%</td>
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<tr>
<td>Straw</td>
<td>10</td>
<td>5%</td>
</tr>
<tr>
<td>Salt</td>
<td>3 lbs. per ton top</td>
<td>0%</td>
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Cost per Ton of Silage.

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<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Value of beet tops at rate of $4 per acre</td>
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</tr>
<tr>
<td>Straw---at rate of $1.00 per ton</td>
<td>$ .10</td>
</tr>
<tr>
<td>Salt---3 lbs. at 60c per cwt.</td>
<td>$ .05</td>
</tr>
</tbody>
</table>

$ .95

Hauling tops and filling silo               $ .70
Initial cost of Excavating Silo--per ton capacity $ .10

$1.75

205
Comparative Analyses.

<table>
<thead>
<tr>
<th></th>
<th>Beet top Silage</th>
<th>Corn Silage</th>
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<tbody>
<tr>
<td>Moisture</td>
<td>64.36</td>
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<tr>
<td>Ash</td>
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<tr>
<td>Crude protein</td>
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<tr>
<td>Crude fat</td>
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<tr>
<td>Crude fiber</td>
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<tr>
<td>Nitrogen free extract</td>
<td>17.62</td>
<td>20.54</td>
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</table>

The results of feeding the beet top silage have been exceedingly satisfactory and economical, and a large amount of the tops grown in this locality will be used in this way during the coming season.

Cultivate

Black Root

A. C. Maxson

In the past, several articles regarding this infant disease of the sugar beet have appeared in “Through the Leaves,” so that most of our growers are familiar with the symptoms as well as the remedies. However, for the benefit of the new growers and those not familiar with the disease this article may not come amiss.

What is Black Root?

Black root is a disease of the seedling plants caused by certain fungi which live in the soil. These fungi are low forms of plants which live at the expense of some living plant of higher order. For this reason they are called parasites or parasitic plants. The blue mold on bread furnishes a common example of this low order of plant, but differs from the parasitic forms in that it lives on dead plants or organic matter.
While black root is caused by the fungus mentioned above, anything which is unfavorable to the growth of the young beets appears to increase the trouble because the weakened plants have less vitality and resistance.

A poorly prepared seed bed, crusted soil, cold damp weather and lack of early cultivation all tend to increase the disease.

**Appearance of Black Root.**

Beets attacked by black root have a part of the root watery or black and usually this diseased part is smaller than the healthy portions. Sometimes only the tips of the roots are black and again the whole root may be diseased nearly to the leaves.

As beets become older this trouble is outgrown in many cases. Such beets look as though the outer skin of the root had split open showing the whitish new growth below. Seldom do beets die from black root after developing 4-6 leaves.

**What to do for Black Root.**

Anything that can be done to improve the condition of soil about the young beets and stimulate them to more rapid growth should be done. If the soil is crusted the crust should be broken. If the soil is dank and cool or compact, cultivate as soon as possible. If the beets are large enough, block and thin them. Do not wait for all sick plants to die first. The hand work improves the conditions, helping the beets to outgrow the disease.

Insist on the labor leaving the largest plants. These are the ones that have already outgrown the black root or are so large that they are not apt to be attacked.
Giving a Canning Demonstration in the Orchard
Canning Vegetables Conserves Food Supply

H. H. Simpson

Save Food by Canning

It is not enough that farmers increase their acreage of crops and that town and city folks plant gardens, but in our eagerness to produce more food we must plan that this increase will be properly cared for, that it may be used when needed. In some localities great quantities of the perishable kind of vegetables are being planted with no thought being given to saving the surplus for winter use. To overlook the supply of food for next winter and turn all efforts to garden truck which could be used immediately would be a big mistake. There is not likely to be a shortage of vegetables during the summer months, and the perishable kind, no doubt will be cheap enough. The important factor in food conservation is for everyone to

Then Cultivate

make plans to store or can everything the garden produces over and above the immediate needs. This applies to both farm and town gardens.

Canning the Essential Factor

Possibly the one best method of taking care of surplus vegetables and fruits is by canning. Many women have been accustomed to canning some of the fruits such as raspberries, cherries, strawberries, gooseberries, peaches, etc., but it is surprising how few make a practice of can-
ning vegetables. There is possibly no other way in which the cost of living can be reduced more easily.

The canning of vegetables is really a simple matter and many members of our Boys and Girls clubs are canning all kinds of products very successfully. Last year a boy 11 years old won the contest in canning, and 2 years ago a girl only 8 years old won in this county and then sent samples of her products to the Soils Exposition in Denver and won first prize. The girl who won the Colorado State Championship last year canned over 400 quarts of vegetables and fruits.

Conditions of Jar Supplies
We have been investigating the supplies of jars and cans and while the supply of tin cans is short and the prices prohibitive, there seems to be no need to worry over glass jars. Mr. Vaplon, State Leader of Club work, who has been investigating this closely says that while some dealers think the glass jar shortage will be serious, the better informed feel sure the supply will be sufficient. The Mason jar manufacturers express confidence they can supply the demand.

If everybody will put to use all jars, bottles and other containers they have on hand, and will not rush to the market and buy a great many more jars than they need there will undoubtedly be sufficient. The Department of Agriculture is strongly urging not only the canning of products, but to dry and store products such as apples, pumpkins, squash, etc.

Demonstrations
We are planning to hold a series of canning demonstrations throughout the county during the second week in July. At these meetings a specialist from the college will explain and demonstrate the cold pack method of canning vegetables. We have already scheduled a number of communities and if your community cares for one of these demonstrations, you had better notify us immediately. This office also has bulletins for distribution giving instructions for the cold pack method.

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Lay Something Up for Winter

J. F. Jarrell

The tendency these days is to live fast and consume all earnings as we go. Some spend faster than they earn while some are always spending and never earn anything. Eventually someone has to pay the bill and often hardships and suffering result. As a nation we are spendthrifts. We have gotten away from the old notions of thrift. We live entirely at the mercy of the tradesmen. We order our midday meal in the morning and our evening meal in the afternoon, depending upon our modern transportation and service to feed us. “The Lord cares for fools,” surely must be true, or else a great many of us would have collapsed before now. It behooves us as a nation to become alive to the situation and do all we can this summer to increase our store of food for next winter. If we need 25 quarts of peas to use we should put up 50 quarts; if we need 50 quarts of berries we should put up 100 quarts and so on through the list. Some one will need our surplus as sure as we live. It does not take an expert chemist to can vegetables and fruit. All it requires is an average size bump of common sense coupled with a desire to do the thing.

The list of things to store away is almost unlimited. Every housewife will have her favorite, but she should add something more this year so as to produce a surplus. There is no danger of this surplus becoming too great, so let’s get busy and try our hand.

Dry some things which you have been in the habit of canning and silo others in pits or store them in the cellar. Suitable cans for canning will be scarce and expensive. It will pay you to plan on saving cans. Beans, corn, fruit and berries can be dried to advantage. Pickles and kraut may be put in barrels or stone jars. Beets, cabbage, turnips and carrots may be siloed in pits or put in the cellar. A
great deal is being said these days about thrift and economy. Let's not ignore the warning but every one who can, buckle in and do his bit at home and not only lay up a store for the coming winter, but be willing to share that store with someone else.

Then, too, the winter of life is bound our way and most of us will need something laid up. Now is a good time to acquire habits which will aid us in our battles, not only in Europe, but in our future life.

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Permanent Prosperity

Alfred R. Williams

A recent meeting of farmers and business men held in Austin, Texas, Mr. Clarence Ousley, of the Texas Agricultural College, made the following statement:

"Let us not imagine that we can perform the miracle of an enduring prosperity from one crop. The people of Dakota tried it with their wheat, we in the South have tried it with cotton, for fifty years, and we are comparatively the most backward people in the country."

Even this early in the season, the writer has heard some farmers make the statement that they were planning to raise nothing but wheat and alfalfa next year. Now, it is not the intention to discourage the growing of wheat or of any other crop, as it is, we as a nation will probably need more wheat this year than we have. The President of our country has urged the largest production possible of all food crops, to meet the food crisis facing the world. But the farmer who puts all his farm land to producing one or two main crops, even though the prices for the crops may at the time be very high, is following a short-sighted farming policy, the effects of which will be felt sooner or later.

Those of us who did not plant potatoes a year ago, can see now where we lost money by not doing so. Who was
it that made the most money on potatoes this year? The farmer who grows some potatoes every year, regardless of years of low prices, for he figures his profits on a term of years, and he knows, that taking good and poor seasons together, high and low prices, he will make what will amount to a good, reasonable profit for each year.

So, while it is our duty as farmers, to make the land produce all that it is capable of producing in this time of need, this does not mean that it is to be done at the expense of decreased fertility, or of a shortage in some very important food crops other than wheat, such as beans, sugar beets or potatoes.

To quote Mr. Ousley once more, "Just exactly as bankers avoid the speculator, the man who buys and sells futures, who has little credit at the bank beyond the amount of his stocks and bonds that he puts up—the man who raises all wheat, or the man who raises all cotton is just the same kind of a speculative risk."

Meteorological Report

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<tbody>
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<tr>
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<tr>
<td>Maximum</td>
<td>77° on 22nd</td>
<td>83° on 28th</td>
</tr>
<tr>
<td>Minimum</td>
<td>19° on 7th</td>
<td>23° on 3rd</td>
</tr>
</tbody>
</table>

Precipitation:

| To date       | 3.28 | 2.11 |
| For month     | 1.36 | 1.31 |
| Greatest in 24 hours | 0.13 on 18th | 0.64 on 29th |
| Departure from Normal | - .58 | - .67 |

Number of Days:

| Clear        | 3    | 13   |
| Partly cloudy| 18   | 8    |
| Cloudy       | 9    | 9    |

Then Cultivate Some More
Crops Real Test of Soil Fertility

Lord Ogilvy
(in "Denver Post")

were assured by the soil chemist that the soil contained ample stores of plant food, nitrogen, phosphorus, potash, lime and so forth, and that it would be foolish to add anything.

The fact remained that the alfalfa field was producing three tons of hay a year where it had produced five and another field a couple of miles away, originally of the same quality, was producing between six and seven.

No doubt the chemist was right, but, however right, there was something wrong somewhere, so discarding analysis of the soil for the moment, we devoted ourselves to a survey of other conditions.

Both fields were in their third year with about 80 per cent of a stand of plants, but the tops and crowns of the plants on the manured ground were perhaps a third larger than on the other and the hay that was about a third grown, five to eight inches longer, whereas in neither case was the ground filled with roots to capacity. The manured field was able to make up the deficiency by branching, the other apparently was not, or in any case it did not. The first year after seeding, the manured field had been cultivated, but after the manure was applied this was found inconvenient and the owner considered the condition of the top soil as about at its best to absorb moisture and the cultivations were discontinued.

Some of the superiority of the manured field was no doubt due to cultivation and a good deal to the fact that it had, through twenty years of cultivation, been treated bet-
The latter, however, showed by analysis that it was rich enough, but the crop showed that there was some deficiency. The unmanured field was of a good loam and absorbed water readily enough, took about an acre foot and retained it well. Without exact measurements, it is impossible to say which field took the most water, but probably that which was manured, and it grew twice the crop and used the most water, as the big crop would leave the soil most dried out.

If the field which produced the poor crops was rich enough, it is evident that the other contained a surplus of plant food and that this surplus was of benefit to the crop, either because it was more available as plant food or because it improved the physical condition of the soil.

It would be possible to write quite a large book of theories as to the reasons for the failure of the poor field to produce a decent crop—to say that the potash remained inactive or so much so that the "twenty-four pounds to every ton" of alfalfa hay was not ready as plant food, though it was in the soil. The same may be true of the four pounds of phosphorus, and that the fifty pounds of nitrogen had not been stored by previous crops in the absence of enough organic matter to promote bacterial action. Any or all these things may be true. But the main point for young people to tie to is that the practical measure of fertility is the crop yield and they should not be satisfied until they reach the highest economical production, whatever theories other people may hold as to what is good enough. One may easily travel fifty miles without seeing a field that produces six tons of hay to the acre, and whole districts are satisfied with two and a half to three and a half tons, with other crops in proportion, but that is no reason why you should accept such yields when bigger ones can be more cheaply got if all the costs of tillage and operation are faithfully applied.

A good job of cultivating ahead of the thinners means a better job of thinning by the labor
Autobiography of a Beet

I was born in Russia.

My experiences, as I remember them, began in the late summer of 1915. The stem on which I grew was cut from my mother and together with others was tied in a bundle and left in the field for two or three weeks. I became hardened and dry but retained in me the determination to grow again as soon as an opportunity presented itself. I had almost given up hope of ever having such an opportunity when I was carried to a large machine into which I and all of the other stems on which there were seed, were thrust. We were pounded, pushed, shaken, rattled together and mixed and the stems on which we had been living while in the field were torn from us. My two sisters—there were three of us in the one seed ball—barely survived the treatment. Peace was ours again only after we had been shaken some more, fanned and placed in a large sack with many thousands of other seeds which had received the same treatment as we had received.

I thought our troubles were over, but this was not true. Talk had been started that we were to be sent to America. All of us dreaded the journey across the ocean as we were not certain of reaching America safely on account of the terrible death machines which had been placed in the water by the enemies of the country in which we had been raised. The bravest of us kept up the courage of our weaker companions and after much hauling and handling we were unloaded from the ship in which we had come safely across on the dock at Seattle. From that place we were rushed to Longmont and placed in a large, dry, tin shed; a warehouse, we heard it called.

The men who handled us seemed to thing that we would
be the last of our kind to come from Russia for many years. Our stay in the warehouse was very pleasant as we became acquainted with many seeds which had been raised almost within sight of the warehouse. They were fresher than we, just as healthy, and were even more determined to grow at the first opportunity than we were.

We had arrived in the warehouse late in the summer of 1916. Early in April of 1917 a farmer came and took the sack in which we were living out to his farm. Here I had my first great sorrow. A mouse got into the sack and killed one of my sisters. I felt angry toward the farmer for leaving us exposed to the attacks of mice, but renewed my determination to grow if I survived until placed in the wonderful fields of which our American-grown friends had told us.

About the first of May we were taken from the sack and placed in a machine which urged us to crowd out of it through a small opening in the bottom, telling us that our opportunity to begin growing was now at hand. We were happy at the thought. But alas! We were dropped in a hard bed of earth and a few dry clods were scraped over us. Many of my friends became completely discouraged and after attempting to grow for a few days, wilted away and died. I had been fortunate to find a few loose particles of soil and from these drew enough moisture to keep me alive. The food with which my mother had supplied me, with the moisture that I stole from the soil, enabled me to get my first two leaves above the surface. My sister, being somewhat weaker, had a harder time of it. However, once we had our first two leaves unfolded the sun helped us to prepare our own food. A friendly rain had made it possible for us to get sufficient water to supply our immediate needs.

We were beginning to feel certain of growing into large healthy beets, but in a few days again despaired of ever amounting to much. Foreign plants—wild oats, lambs quarter, Russian thistle—began to laugh at our attempts to grow, saying that they were entitled to all of the food
stored in the soil and that they were going to have it. The farmer noticed how we were being treated but waited almost too long before he attempted to kill the weeds with his cultivator. For that attempt we were all thankful, but I had grave fears that many of us had been starved too much to ever completely recover from the effects of the starving.

Soon after the farmer had cultivated the field some men and children came along. Their language was strange to us, but we learned that they intended to remove all but the best of us from the field, leaving at least a foot of space between those of us who remained, so that we could grow to the best of our ability. The men hacked and whacked away, never seeming to care where they hit us or if we remained on our feet. I was fortunate enough not to be hit but practically all of the soil from which I was getting my drinking water was torn from me. My sister was torn from around me by one of the children who followed close after the men who were doing the hacking. They tore almost all of the remaining friendly soil particles from around my feet, either with their fingers or with their toes which they pulled along behind them down the row.

I was utterly discouraged and soon lay over on my side, ready to die, feeling that life, even after my firm resolve to live, would be dearly bought. I lay there until night. Then, summoning all of my remaining courage, decided to make at least one more attempt to live, if my main foot—my tap root—would promise its greatest support. In the morning I straightened myself out as best I could, prayed for better treatment and resolved, in spite of my mistreatment to grow into a three-pound beet, with a sugar content of seventeen per cent.

How well I succeed I may be able to tell later if my owner will keep out the weeds, stir up my bed often enough to enable me to resist disease and furnish me with a drink soon enough and often enough to keep me from dying from thirst in the heat of summer.

---E. H. H.
Patriotism

E. P. Bell

No word in the English language strikes deeper into the soul of the average American than the word patriotism. To us the spirit of patriotism is innate. Today a mighty wave of patriotic sentiment is sweeping over America, caused by the invasion of our rights and liberty by European Autocracy. It behooves every American citizen, be he foreign or native born, to take an inventory of himself and renew his loyalty and allegiance to his country.

Within the next six months perhaps more than a hundred thousand of the finest young men of America will express their love and allegiance to America by freely giving up position, friends and home and offering their service and their lives on the altar of their country. This no doubt is the finest and noblest expression of patriotism—for, "Greater love hath no man than this that he lay down his life for his fellow man."

Yet the victory of Democracy over Autocracy will not be won alone on the battlefield with the sword. Almost fabulous sums of money will be needed for waging successfully this mighty world war. Our government, realizing this, has asked her citizens to subscribe to the "Liberty Loan," which will be used by the allies to alleviate suffering and to bring the war to a swift and victorious end. The fact that a large sum of the initial loan went to relieve the suffering and patriotic Belgians caused a thrill of gladness in the heart of every true American. Patriotism in the highest and noblest sense of the word reaches beyond the boundaries of native land and sympathizes with, and helps suffering humanity everywhere. What a wonderful opportunity is offered by the Liberty Loan for the expression of patriotism by those who will not be able to enlist in some other branch of the service! The same motive that
prompts the young men of Colorado to offer themselves on
the battle front also prompts the financier and financial
institutions of our state to subscribe extravagantly and
ungrudgingly to the Liberty Loan.

In the excitement of mobilizing, equipping and training
an army to fight our battles in the trenches of France and
Belgium, we must not lose sight of the other great army
that must be mobilized on American soil to feed the world.
Under our strict Military Selective system none but those
who measure up to the standard of men physically are per­
mitted to go to war and then only after much drilling un­
der the generalship of trained and scientific men. Strange
to say, in this great Agricultural army "Uncle Sam" ac­
cepts the weakling, the invalid and the mentally unfit. Does
it not appear that Generalship is needed in this branch of
the service? Would it not be the part of wisdom to leave
the scientifically trained Agriculturist at home to command
the forces that must feed the world?

Don't feel that you are not patriotic by remaining on the
farm and earnestly, honestly and successfully striving to
increase the productivity of the soil. On your faithfulness
depends the future of Democracy. In the final analysis
when Democracy has triumphed over Autocracy you will
find that the battle was won on the fertile fields of Amer­
ica as well as on the battle front, and the boys in blue over­
alls and brass buttons will share equally in honor with the
boys in blue uniforms in the trenches.
GOOD sanitary measures are always of utmost importance in the control of infectious and contagious diseases.

Without good sanitation, other preventive measures are likely to produce indifferent results, while thorough sanitary precautions are in themselves powerful weapons against the invasion of disease.

The treatment of hogs with serum and virus for the prevention of cholera illustrates the point that I wish to emphasize. In far too many cases this treatment is looked upon as a panacea and too little attention is given to the proper feeding and sanitary measures that must accompany it if the best results are to be obtained. It is even possible for the treatment itself to lead to disastrous results when due precautions as to sanitation are not observed.

Whenever a wound is made in the body of an animal, whether it be inflicted accidentally or in the process of administering treatment, there is constant danger of it becoming infected by some of the many kinds of germs that are present everywhere in vast numbers. Very many times, when abscesses develop after vaccination against cholera, the owner of the hogs jumps to the conclusion that the serum or virus is to blame when the real cause is infection that has gained entrance to the wound before it has healed, and which could have been prevented by a little care and precaution.

To provide the right kind of quarters for the pigs after they have been vaccinated is an important consideration. They must be kept away from other hogs, both for the good of the ones that are vaccinated and for the others, as will be explained later. A shed that is clean and dry and a pasture with short grass is an excellent place for hogs while the wound made by injection is healing. A
pasture that contains high grass, weeds, or stubble is dangerous because materials of that kind dragging under the hog's body is likely to keep the wound open and infection is more liable to occur. It only requires four or five days for the small wounds to heal and during that time the hog should be kept out of wallows and streams. A muddy wallow is a good breeding place and harbor for germs of infection and a clean concrete pool is much safer at all times.

When vaccinated hogs are kept in a shed or small lot, some extra precautions are well worth while. That the quarters should be kept clean goes without saying. Spraying at frequent intervals with lime wash or a good disinfectant greatly reduces the danger from blood poisoning and abscesses. A concrete or tight board floor can be thoroughly cleaned and disinfected, but even a dirt floor can be improved by spraying thoroughly with crude oil.

In the feeding of hogs following vaccination, the most common mistake is feeding too much. If the hogs are on good pasture, but little more is required. Slops made of oilmeal, middlings, tankage, or similar products can form the major portion of the feed. Corn is recognized as being more heating and should be given very sparingly. Starting with a very light ration immediately following vaccination the amount can be gradually increased and at about the fourth week the hogs can be back on full feed. The development of the least sign of sickness during this time should be a signal to cut down the ration.

In about two or three weeks after serum and virus have been administered to a herd the hogs should be thoroughly inspected to see if any of them show symptoms of cholera. If any such are found they should be slaughtered and their bodies burned or buried in quicklime. Careful experiments have shown that certain animals may become chronic carriers of the disease and such animals are a constant menace. They go about spreading the germs of
disease, even though it requires careful examination to detect that they themselves are infected. One of the reasons it is so important to keep vaccinated hogs away from hogs that have not been vaccinated for a period after the treatment is for the purpose of preventing any that may become chronic carriers from spreading disease in a non-immune herd.

Whether it is a case of vaccination of a well herd of hogs merely for the purpose of making them immune, or the vaccination of a herd that has broken with cholera, the cleaning and disinfecting of the premises after the hogs have recovered must be most thorough. All litter and rubbish of every kind must be raked up and burned or mixed with quick-lime and deeply buried. Burning is the safest method for disposing of anything that can be so disposed of. The buildings, floors, fences, etc., must be sprayed with a strong disinfectant. A three or four per cent solution of any standard saponified cresol solution is good for this purpose and it is a good plan to add sufficient lime to plainly show the surface covered by the disinfectant.

To thoroughly rid the premises of the germs of disease, it is necessary to reach every crack and crevice with the disinfectant. Loose boards in the floor must be raised and the litter from beneath them removed and burned. The difficulty of disinfection depends to a great extent upon the nature of the quarters. A pen with concrete or tight board floor and with comparatively few cracks and corners in the partition walls can be easily and thoroughly disinfected. Where treated hogs or sick hogs are kept in a lot or pasture it is often necessary to depend to some extent upon the sun as a disinfectant. All material that can be burned should be raked into piles and burned immediately. It is well to plow the lot after a few weeks. If these precautions are taken, four or five months of warm, sunny weather will destroy the infection in yards that are well drained.

The control of hog cholera calls for the full utilization of every means available. The first of these begins before the pigs are born and consists in so breeding and handling
their sire and dam that they can produce strong, thrifty pigs. This alone is an effective step against cholera or any other disease to which hogs are subject. Then, by providing sanitary quarters, keeping the pigs free from blood sucking parasites, both external and internal, and by giving wholesome feeds that supply the necessary nutrients in the proper proportion, the hog raiser can set up a second effective barrier against disease. These two, the breeding of strong, thrifty pigs and proper feeding in sanitary quarters, are sufficient to ward off the invasion of disease in a great many cases. But the man who desires to protect his herd to the greatest possible extent goes one step further and immunizes them by vaccination. By so doing he does not lessen the value or importance of the first two steps, but rather adds to them. Vaccination is of immense value, but it is neither a cure nor even a satisfactory preventive unless the right kind of breeding, feeding and sanitation are practiced in connection with it.

Then Cultivate Again

Farmers Rally for the War

From “The Sugar Beet”

ARMERS of the Nation are rallying to the Colors for the war *with Germany. They have been told that with them rests the winning of democracy’s sternest struggle. For it is proverbially true that an army “fights on its stomach;” it cannot win unless it is well fed.

The farmers of America will not fight in the trenches, but without them no man in the far flung battle line of the Old World could perform his heroic duty. Without the American farmer, Sir Douglass-Haig’s magnificent army could not develop the force to break the Hindenburg line.
Without him the French, the Russians, the Italians, could never roll back the Teuton tide that threatened to engulf freedom. It is the American farmer who has largely fed the armies of the Allies and who will now contribute, in even more generous measure, since the United States has entered the Titanic struggle.

The responsibility is a grave one. It might well stagger even a brave mind. For the world's food shortage is the greatest in all history and the demands put upon it are swelling daily. Apparently all the powers of destruction and death are leagued to drag the nation into horror and despair. To meet this America is organizing.

The American farmer, true to the traditions which have never shown him wanting in a crisis, is forming an army no less formidable than the khaki-clad hosts across the seas. But his trenches are the furrowed smiles that unroll in the wake of the plow. His weapons are the implements of peace and plenty. His time, his labor, his genius are constructive instead of destructive. And his part in the struggle for God and Right is as sublime as the most desperate venture on the shore-swept plains of Belgium and France.

In every state the call has gone forth and the granges are organizing by districts. In spite of labor shortage, in spite of extra costs, in spite of every difficulty that faces the farmer, he is going to make this year's crop the bumper crop of creation. Duty has called him to the old and homely tasks that have made his life hard in the past, and those tasks are to be harder than ever before.

No shouting throngs will welcome him when the fight is done. No medal will be pinned to the sweat-faded shirt he wears. No orators will coax the eagle from the crags to scream his praise. But in his heart will be the satisfaction of one who spends himself in the service of mankind. And in his eyes will be "the light which shineth not on land or sea."

There is a task for us, men. And we shall know that it is well done.
I Am the Unimproved Highway

H. G. Andrews

(Copyright, 1917, by William Penn Highway Association)

I am the unimproved highway.
My name is Mud.
The feet that pattered in primeval slime gave me birth.
Unchanged while the ages passed I have endured. Time has but served to increase my infinite variety. Earth born, and without a soul, yet have I lived. From the beginning I have been man's enemy.
A dust colored python am I, stretching my length across the hills, waiting my time to crush endeavor.
I have snared caravans that left bleaching bones in lands now desert.
Empires have fallen because of me.
I have turned victories into routs; I have trapped mighty leaders and have crushed armies.
I am without faith; and those who trust me I deceive.
Today I am fair to look upon; tomorrow a steaming bog. I add Difficulty to Distance.
With Isolation do I conspire to unjoint the endeavors of men. I tug at the wheels of the grain cart that bread may be dear. I hamper those who would feed the race. I am an enemy of church and school. I mire the healer on his rounds and delay his coming that little ones may die.
I am a disrupter of Home. I speed the firstborn to the cities when I am fair to see; and when he would return I face him with my forbidding depth.
I am minister to Bitterness; and lay a tax on all the world.
There are none who live who do not pay me tribute.
When men ploughed with crooked stick I was there.
When the ancients covered me with stones I slipped away to other lands.
I am the oldest Lie that lives today. Men count me cheap. I know the price they pay who count me so.
I am the highway—the unimproved highway,
My name is Mud.
American Methods of Beet Growing Could be Bettered

From "The Sugar Beet"

In America, the sugar beet industry, is, as yet, in its infancy and the agriculturists still have many problems to study. If we compare the average yield in leading European countries with those in this country we would notice that our yield is far below the European returns. The average yield of 1914 in the United States was 10.6 tons per acre as compared with 14.17 tons per acre in Germany; 12.52 tons per acre in France.

These discrepancies cannot be entirely caused by the difference in soil and climate. A great deal of damage in our beet fields is undoubtedly caused by poor thinning.

In this country, this delicate work in most cases is left in the hands of disinterested laborers. The thinning contractor is paid by the acre, and in most cases pays his men also by the acre and deducts 10 per cent for commission. These men try to go over as much ground as possible, to the detriment of the sugar beet crop. There is no selection of the healthiest beets by the thinners.

The great trouble with the average beet grower is that he does not spend enough of his own time in the field while the thinning is going on. In most cases he starts the crew at work and then leaves them to finish it. By personal supervision, the farmer will find at the completion of the work that he will have a better and more even stand, less weeds, and also less doubles.

We must keep in mind that there is a triple object in view in thinning:

1st---The selection of the strongest beets;
2nd---The even distribution of a certain number of beets per acre;
3rd---The destruction of all weeds between the beets in the rows, and two inches on each side of the beets.

The next important point to discuss is when should the
thinning commence? As a rule, under average conditions, the earlier the beets are thinned the better for the growth and yield of the crop, but not before all the sprouting seed in the ground is up, nor all the weeds have a reasonable start.

Our Annual Hauling Bill of $650,000,000

From “The Highway Magazine”

The public roads throughout the country,” says J. E. Pennypacker, “which constitute the primary means of transportation for all agricultural products, for many millions of tons of forest, mine and manufactured products, and which for a large percentage of farmers are the only avenues of transportation leading from the point of production to the point of consumption or rail shipment, have been improved to only a slight extent. By reason of this fact, the prevailing cost of hauling over these roads is about 23 cents per ton per mile. More than 350,000,000 tons are hauled over these roads each year, and the average haul is about 8 miles, from which it can readily be seen that our annual bill for hauling over the public roads is nearly $650,000,000. The cost per ton-mile for hauling on hard-surfaced roads should not exceed 13 cents. It is therefore evident that if our roads were adequately improved a large annual saving in the cost of hauling would result.”

The difference between 23 cents and 13 cents is 10 cents, which is the ton mile tax of poor roads which the city people pay, for most of the hauling is toward markets or shipping points and the cost of this hauling is part of the total expense of products of the land to the consumer. The total is about $280,000,000 which the 45,000,000 people living in the cities and towns of the United States pay annually on account of poor roads. This averages over six dollars a year per person.
SINGLE slice of bread seems an unimportant thing. In many households one or more slices of bread daily are thrown away and not used for human food. Sometimes stale quarter, or half loaves are thrown out.

Yet one good-sized slice of bread—such as a child likes to cut—weighs an ounce. It contains almost three-fourths of an ounce of flour.

If every one of the country’s 20,000,000 homes wastes on the average only one slice of bread a day, the country is throwing away daily over 14,000,000 ounces of flour—over 875,000 pounds, or enough flour for over a million 1-pound loaves a day. For a full year at this rate there would be a waste of over 319,000,000 pounds of flour—1,500,000 barrels—enough flour to make 365,000,000 loaves.

As it takes 4½ bushels of wheat to make a barrel of ordinary flour, this waste would represent the flour from over 7,000,000 bushels of wheat.

Fourteen and nine-tenths bushels of wheat on the average are raised per acre. It would take the fruit of some 470,000 acres just to provide a single slice of bread to be wasted daily in every home.

To produce this much flour calls for an army of farmers, railway men, flour-mill people. To get the flour to the consumer calls for many freight cars and the use of many tons of coal.

But some one says, a full slice of bread is not wasted in every home. Very well—make it a daily slice for every 4 or every 10 or every 30 homes—make it a weekly or monthly slice in every home—or make the wasted slice thinner. The waste of flour involved is still appalling—altogether too great to be tolerated when wheat is scarce.

Any waste of bread is inexcusable when there are so many ways of using stale bread to cook delicious dishes.

The United States Department of Agriculture, Washington, D. C., or your State Agricultural college, will tell you how to use stale bread in many ways.
THROUGH
THE
LEAVES

JULY, 1917
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NOTES
N. R. McCreery

Our beets have been making a good growth during the past few weeks of good weather, and excellent progress has been made in the thinning. Our observation has been that the help has started with the beets a little smaller than their custom, which we believe will work out to advantage in the growth of the crop. Certain it is that beets that can be thinned and have a chance to straighten up before the hot days such as we have had for some time, have a start that means much in the yield. This is one of the big advantages of early planting.

Many growers have seen the value of fall plowing in their work this spring. There are very few seasons that you cannot get your crop in several weeks earlier if the plowing has already been done in the fall.

Now is the time to get ready for next year's planting. You will be soon cutting your grain. Threshing machines may be scarce. Why not stack your grain and then you are ready when the thresherman is, and do not need to worry if rains and bad weather intervene. Besides you have an opportunity to work your field this fall if the crop is off early.

Disking the stubble before plowing will pay, as it will put the ground in much better shape for retaining moisture. The stubble turned under without disking leaves the ground loose and open so it dries quickly.
During these hot days do not neglect to use your cultivator as much as possible until the beets become too large.

+ + + +

The time is not far away when you will start the irrigation of your beets. With the large amount of rainfall this spring it may not be necessary quite so early as some years but it is better to time the starting of your irrigation by the condition of your crop and needs of your crop than by the rain that fell last week or before. Do not let your beets suffer too much before applying the water.

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**In Regard to Killing Pheasants**

**An Act Concerning Pheasants and the Killing and Trapping Thereof.**

Be it Enacted by the General Assembly of the State of Colorado:

Section 1. Pheasants, which are destroying crops of grain, vegetables or fruit, may be killed or trapped by the owner, tenant or lessee of the land upon which such destruction is taking place, providing said owner, tenant or lessee, first secures a permit as hereinafter provided, from the State Game and Fish Commissioner.

Section 2. The State Game and Fish Commissioner shall issue permits for the killing or trapping of pheasants, to the owner, tenant or lessee of land, upon which it is clearly shown that pheasants are damaging crops, said permit to be issued under such rules and regulations, and to carry such restrictions as the State Game and Fish Commissioner shall prescribe; provided, however, that no birds thus killed or trapped shall be placed upon the market or offered for sale. Effective July 11, 1917.

(Approved April 10, 1917, at 11:55 o'clock A. M.)
By Comparison of Food Values Sugar is Cheap

H. Mendelson

Food eaten is used in and by the body mainly for:

1. Making new tissue and bones (growth)
2. Replacing the normal wastage of tissues and bones
3. Maintaining the normal temperature of the body by burning the food, just as coal is burned in a boiler furnace, and transforming it into the same products of combustion, namely, carbonic acid and water.
4. For furnishing energy for work.

Food eaten in excess of the requirements for the maintenance of the tissues and the normal temperature and for the energy expended in work, is normally transformed into fat.

The part of the food used for building and replacing tissue is called protein or albumen. All food with the exception of sugar, pure starch and pure fats like lard or oil, contains some protein. For instance---

- Dried and smoked beef: about 26% digestible protein
- Canned and boiled beef: about 25% digestible protein
- Full cream cheese: about 25% digestible protein
- Canned salmon: about 21% digestible protein
- Smoked ham: about 14% digestible protein
- Fresh beef (vari. cuts): about 14-19% digestible protein
- White beans (dry): about 17% digestible protein
- Wheat flour: about 9-19% digestible protein
- Oat breakfast food: about 14% digestible protein
- White bread: about 7-8% digestible protein
- Milk (full or skim milk): about 3-4% digestible protein
- Potatoes: about 1% digestible protein

Protein while being used in the body furnishes also heat, but the main source of the heat and energy generat-
ed in the body comes from fat, starches and sugars or similar bodies, commonly classed as carbohydrates.

Meats contain very little carbohydrates, but various percentages of fat.

Milk contains, besides the protein, about equal percentages of fat and sugar.

Cereals contain sugar, starch and other carbohydrates and little fat.

One pound of fat furnishes two and one-fourth times as much heat as starches or sugars.

The relative efficiency of food materials for heat and energy generation can be measured by determining the amount of heat generated by each. The amount of heat necessary to raise the temperature of one pound of water four degrees Fahrenheit, serves as a unit of measurement. This amount of heat is called a calory. If we say the fuel value of one pound of butter is 3410 calories, we mean that the heat produced by one pound of butter when utilized in the body is enough to heat 3410 pounds of water 4 degrees.

Butter and Sugar.

The fuel value of one pound of sugar is 1750 calories. Roughly speaking, one pound of sugar generates about the same heat in the body as one half of a pound of butter. As far as your heat requirements are concerned, you can replace one with the other. Sugar at present retails at about from eight to ten cents per pound—say nine cents. Good butter retails at not less than forty cents per pound. On this basis nine cents worth of sugar furnishes as much heat or energy in the body as twenty cents worth of butter.

Potatoes and Sugar.

Potatoes contain about 1.5% protein and 295 calories
per pound. Normally we eat potatoes for their starch, protein in a meal is usually supplied by meats or eggs.

Potatoes contain about one-sixth the fuel value of sugar. Therefore, the actual nourishment in sugar and potatoes costs the same if potatoes sell at one-sixth of the price of sugar. At present, potatoes retail at five cents a pound. If they were selling on the basis of the food value of sugar, at nine cents the pound, they are worth only 1.5 cents per pound.

Bacon and Sugar.

Bacon contains about 8.8% digestible protein and 2720 calories per pound. Good bacon retails now not often below thirty cents. The fuel value of one pound is equal to about 1.6 pounds of sugar, or thirty cents worth of bacon has the same fuel value as about fifteen cents worth of sugar. If you put up your own jams and jellies containing 50% sugar and you get your farm hands to eat them liberally, you can put the same amount of energy into them at half the cost as with bacon, even if sugar costs nine cents a pound.

Cereals and Sugar.

Flour contains about 9.7% digestible protein and 1635 calories per pound. It retails now at about six and a half cents per pound, and therefore as fuel is cheaper than sugar at nine cents per pound.

Shredded wheat at fifteen cents the package containing about three fourths of a pound, retails at twenty cents per pound. It contains about 1680 calories per pound and is therefore more expensive than sugar, nine cents worth of sugar containing the same fuel value as twenty-one cents worth of shredded wheat.

Oatmeal contains more fuel value per pound than any other cereal—namely, 1800 calories. If it costs as much or less than sugar per pound, it is the cheaper food.

Cornmeal contains 1640 calories, or but very little less
than flour, and therefore at a lower price is really a cheaper food than sugar or flour.

**Eggs and Sugar.**

Eggs contain 12.7% digestible protein and 635 calories per pound. It contains about 1680 calories per pound; one egg therefore contains about 100 calories. It takes 17 eggs to furnish about the same fuel value as one pound of sugar. At present retail prices this means sixty cents worth of eggs have the same fuel value as nine cents worth of sugar. Of course eggs are eaten for their protein mainly, and not for their fuel value.

**Milk and Sugar.**

Ordinary milk averages about 3.2% digestible protein and 310 calories per pound, if it contains 3.8% fat, which is good for Holstein cows. Jersey milk contains more. At ten cents a quart, equal to about two pounds, you buy 610 calories for ten cents, while ten cents worth of sugar gives you about 1900 calories.

**Milk, Beef and Cheese.**

However, milk can be better compared with meat. Medium round steak contains about 18.4% digestible protein and 890 calories per pound. If it retails at twenty-five cents per pound, you buy about the same number of calories as in three pints or fifteen cents worth of milk; but you get more protein in the meat.

Full cream cheese contains about 25% digestible protein and about 1885 calories per pound, considerably more protein than round steak and about twice the calories, so that cheese even at twice the price per pound is a little cheaper than round steak.

As a producer of energy, neither milk nor cheese furnish as cheap a material as sugar.

**Canned Peas.**

They contain about 3.6% protein and 235 calories per
pound. It takes, therefore, about seven pounds of canned peas to equal the calories of one pound of sugar.

The following table contains the percent of digestible protein and calories per pound of various foods as given in Farmers Bulletin No. 142 by the U. S. Department of Agriculture. From these data are calculated the cost of one pound of protein and of 1000 calories based on the retail prices given:

<table>
<thead>
<tr>
<th>Material</th>
<th>Retail Price per pound</th>
<th>Protein %</th>
<th>Calories per pound</th>
<th>Cost in cents per pound</th>
<th>Per pound protein</th>
<th>Per 1000 calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornmeal</td>
<td>5</td>
<td>7.8</td>
<td>1640</td>
<td>64</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>Wheat Flour</td>
<td>6</td>
<td>9.7</td>
<td>1635</td>
<td>62</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td>Oatmeal</td>
<td>8</td>
<td>14.2</td>
<td>1800</td>
<td>56</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>Sugar</td>
<td>9</td>
<td></td>
<td>1750</td>
<td></td>
<td>5.1</td>
<td></td>
</tr>
<tr>
<td>Lard</td>
<td>30</td>
<td></td>
<td>4000</td>
<td></td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Bread</td>
<td>10</td>
<td>7.8</td>
<td>1200</td>
<td>128</td>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>Bacon</td>
<td>30</td>
<td>8.8</td>
<td>2720</td>
<td>341</td>
<td>11.0</td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>40</td>
<td>1.0</td>
<td>3410</td>
<td>4000</td>
<td>11.7</td>
<td></td>
</tr>
<tr>
<td>Cream Cheese</td>
<td>35</td>
<td>25.0</td>
<td>1885</td>
<td>71</td>
<td>13.2</td>
<td></td>
</tr>
<tr>
<td>Dry Beans</td>
<td>20</td>
<td>17.5</td>
<td>1520</td>
<td>114</td>
<td>13.2</td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td>5</td>
<td>3.2</td>
<td>310</td>
<td>156</td>
<td>16.1</td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td>5</td>
<td>1.5</td>
<td>295</td>
<td>334</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>Round Steak</td>
<td>25</td>
<td>18.4</td>
<td>890</td>
<td>136</td>
<td>28.1</td>
<td></td>
</tr>
<tr>
<td>*Eggs</td>
<td>20</td>
<td>12.7</td>
<td>635</td>
<td>157</td>
<td>31.5</td>
<td></td>
</tr>
</tbody>
</table>

* At 40c per dozen and six eggs per pound.

This table shows that as a source of protein at the retail prices given, oatmeal, cornmeal, cream cheese and flour are the cheapest.

As a source of energy and heat only, cornmeal, oatmeal and flour are cheaper than sugar. All fatty animal products are much more expensive for this purpose.

Insofar as the consumption of these is decreased and that of sugar is increased, the cost of food will be de-
creased without decreasing the actual amount of nourishment obtained.

Home canned fruits, jams and jellies are probably the most convenient and palatable forms in which to use sugar. Even if the price of sugar appears high as compared with former years, it is not expensive compared with the price of actual nourishment in other food materials. It would be false economy to use less sugar just because it costs nine cents per pound.

This table means in ordinary language that the more your daily bill of fare consists of cereals, bread, lard, sugar and cheese, the cheaper it is. This is of course neither new nor startling. People with moderate means and common sense always have followed this practice. Perhaps it is not quite recognized commonly what an expensive food potatoes and eggs are.

Vegetables not given in this table have a rather low food value, and if bought at a price per pound approximating that of cereals or sugar are quite expensive.

Of course it is well known that a healthful diet cannot entirely be built up on the basis of a given quantity of protein and calories. It is necessary to have some of the animal products like milk, butter or meat, as they evidently contain some substances not found by chemical analysis, but very important to the full development of the body. Also, men as well as animals, need some bulky food or roughage supplied by vegetables. But there is no doubt that a considerable part of the most expensive food materials can be replaced by the cheaper ones shown in the table without harmful effects. It would not be real economy to cut out sugar just because it costs nine cents per pound.

In all schools and colleges the principles of canning are taught these days. The clubs organized by the county agents also spread a great deal of knowledge, so that everybody not entirely familiar with the best practice can easily obtain information.
Irrigation.

We are apt to think that because of an abundance of rainfall during May that we can withhold our irrigations depending upon the stored water to carry our crops until relatively later than in dryer years.

Great care must be exercised after prolonged wet spells to prevent crops from suffering from lack of water. Those who have irrigated wheat this summer no doubt have been surprised at the amount of water required to wet the fields.

The sudden change from cool, wet weather to hot, dry weather finds the crops poorly prepared to withstand drought.

Sugar beets will require relatively early irrigation for two reasons: 1st. Because of the conditions of the soil which has resulted from the wet weather. 2nd. Because of the fact that small beets suffer with more moisture in the ground than do larger ones because of the relatively small root growth. Don't wait too long to water your beets.

Web Worms.

The moths of this pest are appearing in considerable numbers about the beet fields in some districts. Be on the lookout for them; call your field man's attention to them and be prepared to spray early if necessary. Remember, it pays to be prepared to fight the pest just as soon as it appears.

Grasshoppers.

Now is the time to fight grasshoppers. The following
poisoned bait spread thinly over ditch banks and fence rows will destroy this pest:

20 lbs. bran.
1 lb. Paris green
2 qts. molasses
4 lemons
3 gal. water

Mix the Paris green and bran dry. Dissolve molasses in water and add the lemons, finely cut, rind and all, to the water, and mix the bran with this.

The above will cover about 2 1/2 acres. Do not leave large lumps in the field, as stock or poultry may eat them and be killed.

Spread the poison before sun up in the morning.

---

**Meteorological Report**

**MAY, 1917**

**Temperatures:**

<table>
<thead>
<tr>
<th></th>
<th>1917</th>
<th>1916</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Maximum</td>
<td>59.8°</td>
<td>70.6°</td>
</tr>
<tr>
<td>Mean Minimum</td>
<td>36.8°</td>
<td>38.4°</td>
</tr>
<tr>
<td>Monthly Mean</td>
<td>48.3°</td>
<td>54.5°</td>
</tr>
<tr>
<td>Departure from Normal</td>
<td>-8.3°</td>
<td>-1.1°</td>
</tr>
<tr>
<td>Maximum</td>
<td>-84° on 15th</td>
<td>93° on 9th</td>
</tr>
<tr>
<td>Minimum</td>
<td>-18° on 5th</td>
<td>30° on 1st</td>
</tr>
</tbody>
</table>

**Precipitation:**

<table>
<thead>
<tr>
<th></th>
<th>1917</th>
<th>1916</th>
</tr>
</thead>
<tbody>
<tr>
<td>To date</td>
<td>7.94</td>
<td>5.13</td>
</tr>
<tr>
<td>For month</td>
<td>4.66</td>
<td>3.02</td>
</tr>
<tr>
<td>Greatest in 24 hours</td>
<td>1.36</td>
<td>1.15 on 19th</td>
</tr>
<tr>
<td>Departure from Normal</td>
<td>+1.33</td>
<td>-.22</td>
</tr>
</tbody>
</table>

**Number of Days:**

<table>
<thead>
<tr>
<th></th>
<th>1917</th>
<th>1916</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Partly cloudy</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Cloudy</td>
<td>13</td>
<td>1</td>
</tr>
</tbody>
</table>

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Farm Laterals

Alfred R. Williams

EVERY often we hear a farmer say that farming in the west would be all right, if we didn’t have to work so hard to irrigate the crops. Of course there is a great deal of work connected with irrigation. The choice between farming in a semi-arid country, such as western Kansas, or in Colorado, and giving the crops a drink when they need it, must be made on the basis of whether it is better to expect a drouth almost any year, or to work a little harder and put water on the crops. A great deal of the hard work connected with irrigating could be done away with, if the irrigators would irrigate to the best advantage.

The first thing to plan for is plenty of laterals properly located and well built. Water travels in the line of least resistance, and is controlled entirely by gravity. If the main lateral brings a good supply of water to the farm, the work of irrigating can be made easy or hard, according to the way the water is handled. It is well, then, to lay out a system of farm laterals so as to irrigate the crops with the least possible work, and with the least amount of water, an important item.

It is a poor plan to wait until it is time to irrigate before making ditches. The ground will generally be hard and baked, turning up in big clods, and making a poor ditch bank, besides, there is the added disadvantage, especially in grain or hay, of having the crop so tall that small ridges and low places cannot be followed closely, with the result that the lateral is not put in the proper place for the best irrigation.
Laterals must be built on grade, and as part of a plan of ditches which takes into consideration the contour of the land, the nature of the soil, the amount of water to be used, and the kind of crops. All laterals should be built large enough to carry the head of water it is intended to use on that particular part of the field.

In estimating the size of a lateral, the slope of the land must be taken into account, as much as the size of the field to be irrigated and the quantity of water the lateral is to carry. Again, soil that washes easily requires laterals with little fall, and if the soil is very light and sandy, it may be necessary to put in checks and drops in order to keep the ditches from washing into gullies.

A good irrigator wants plenty of laterals and cross laterals. As a rule, short runs of water are most economical both as to water and time, and the water is more easily controlled. On heavy soils, the runs of water may be longer, to good advantage, than on sandy soils. Personally, the writer would prefer to have the runs of water in rowed crops, such as potatoes and beets, not longer than 500 to 600 feet, and believes that a better job of irrigating can be done with runs of this length than with longer. It is very easy for the upper part of the row, (nearest the lateral), to get too much water, before the lower end has been soaked enough, and with runs of a reasonable length, this trouble is reduced.

By spending one hour in laying out farm laterals, we may save two hours time (and more) in irrigating. The saving in labor, however, is not the only reason for a proper layout of laterals. The irrigation of a crop is usually done at a critical period in the crop's growth, that is, when it needs water. Therefore, it is important that water be delivered quickly and continuously. It is poor policy to have to depend on a system of poorly located, and half built laterals at such a time. Laterals are like fences, a well built one does the work it should with little trouble to the owner, a poorly built one is a source of continuous bother.
The function of the experimental farm is not generally understood. The general belief is that it is the same as a demonstration farm. People quite generally believe that the work is carried on with a view to showing how things should be done. The facts are not in accord with the common belief.

The experimental farm is engaged in the work of testing out theories. Some one believes that a certain soil treatment as regards the application of moisture, will produce an increased yield of beets. Another believes that the application of commercial fertilizer of one sort or another will be a paying investment. Some favor close spacing of beets and others prefer a wide spacing. Some favor certain crop rotations and others think continuous cropping, with fertilizer, will give larger returns.

How should we know who is right? You may suggest drawing on the experience of men who have tried the various methods. But when we investigate we find that a certain field returned a certain yield under certain conditions. There is nothing to show just what would have been produced under other conditions. You say the field across the road gave a different yield under different treatment.

We investigate and find the soil is quite different, and water was applied at a different time and in a different quantity. Cultivation and planting time were not the same. You must agree that any deduction made from the records of the two fields is at best only a good guess.

Contrast the above basis of comparison with the methods used to get results on experimental farms. The usual
method of treatment is carried as a check or standard. The other methods under test are handled in close proximity. The plowing, harrowing, seeding, watering, blocking, thinning, cultivating and harvesting are done with the same tools, in the same manner, by the same men, and as nearly as possible on the same day. The tests are repeated several times to avoid the different effects of local soil variation. The yields of each small field are computed, and compared with the yield obtained from the field adjacent which received a different treatment. All of the fields treated in one way are averaged and compared with the average of fields treated in a different way. Then the same thing is repeated for several years. Certain ideas are shown to be good, others are shown to have little or no value.

When the figures are all added and the conclusions are drawn, if the result means an increase of one-half ton to the acre for each acre of beets grown it will mean an added income to the farmer of tens of thousands of dollars, and very little additional expense.

Usually the findings of the experimenter are gradually being put into practice so that by the time the test has advanced to the stage where the facts may be cited as proof, the new idea is no longer considered an experiment. Experimental values are small and cumulative rather than large and definite.
The Soil We Till

J. F. Jarrell

WHEN we consider the size of the earth and compare the thickness of the soil to that of the earth, it appears as a very thin layer indeed. In fact it is.

We are taught that in the early days of the earth’s existence there was no soil, only stone. Then the stone began to crumble from the effects of moisture, sun and wind. Moisture came and washed small particles from the surface of the stone. A portion entered into the crevices and was held there and later froze, causing other particles to break away. The sun came out and melted the ice and liberated the water, which ran out of the crevices, and carried with it the loosened particles of stone. The wind came and lifted some of these and later dropped them in some depression. At the same time it tugged and pulled away, loosening some which it did not lift at this time, but which later joined in the procession to lower points.

The raindrops came together into streamlets, these joined into brooklets, these joined into larger and larger streams which finally found their way into the ocean, there to be evaporated and returned to the stone in the form of vapor by the winds, under the influence of the sun, to continue the process of wearing down the stones into soil. The first soil to find a resting place of any permanence was of necessity in the valleys along the streams. These soil spots were at first very small, but continued to grow by being added to from their original source. Then plants came and began to grow and die, adding their bodies to the mass; by decay they became incorporated with the soil particles from the stone and
the combination gradually developed into what we call soil and which is the thing of prime importance when we consider agriculture or even when we consider animal life.

The above is only a dim outline of the many processes of the development of our present day soil, but it will serve to give us an idea from whence our material forms came and also whither these forms are bound.

Some people appear to think these days that the soil and the tillers of the soil are in a class together and of very little benefit to any one. The soil is ground into dust and is such a nuisance to get into people's eyes and spoil their clothes, and the tillers of the soil persist in coming to town and gawking around and getting into people's way; which leads us to think that if it were not for the nasty dust and the pesky soil tiller these people would be able to better endure life.

I have no idea how many obstructions to real progress, termed people in the above paragraph, there are in existence, but I do know that I have met a few. It is not these objects with which we are mostly interested in Northern Colorado. The soil tiller is vastly in the majority and he is working at the fountain head of all produce which goes to feed our nation and should it ever come to a final show down he would survive when all else has passed on and joined in the soil making process.

The soils of Northern Colorado are of a vast range of types, these types were controlled by the nature of their origin. In the mountains to the west of us we have many kinds of stones and to their disintergration we owe to a large extent our existence in this section today.

Granite forms a large part of some sections, shale, limestone and sandstone the large part of other sections. These and the mixtures of these, form, with their offspring, "vegetation," our soil of today.
As agriculturists we are engaged in the tilling of the soil and form the woof and warp of all civilization, our job is a real one and the man who cannot take it seriously is making a mistake which he will never be able to correct.

Man has drawn lines over the soil and allotted the surface of the earth to the care and tending of individuals; as individuals we should produce the most possible food for man from a unit of soil surface. The question arises in the minds of all, what is the crop which will produce the most human food per unit of area and at the same time bring us the best financial returns; for as our civilization exists today we need to consider not only the largest immediate returns, but also the returns which lead to permanence. "Keep the soil and the soil will keep you," is true and will hold true to the end of time.

Mr. Mendelson tells us that an acre of sugar beets ranks as one of the very highest yielders of human food and at the same time, if properly handled, helps to secure the very best soil conditions. As a race, the soil is our life, for from it come all things, even the spuds, corn and sugar which we need so badly to keep up the life cycle of the race.
Country Faces Food Shortage

The Great Western Sugar Company has received copies of a circular letter sent out by the National City Bank of New York in which this institution is calling attention to the serious crop outlook for the coming year. The bank says, among other things:

"This country entered the present crop year last July with 164,000,000 bushels of wheat carried over from the crop of 1915, and in 1916 produced 482,000,000 bushels of winter wheat and 158,000,000 of spring wheat; total supply 804,000,000.

"This year there will be practically no wheat carried over and the Government's estimate upon the winter crop forecasts a yield of only 430,000,000 bushels. On this basis the spring wheat crop must be 214,000,000 bushels larger than last year in order to give us a wheat supply equal to what we will export and consume in the crop year now closing."

The bank points out in the circular that this is a very alarming outlook and that other food crops must be grown to meet the deficiency. The bank seeks to impress upon every one the fact that the country faces a very severe food shortage and that it is a question of supply, not price.

Along the lines laid down by the bank's bulletin, The Great Western Sugar Company is urging that farmers engaged in growing sugar beets, as well as those growing other crops, should bend every effort towards giving the most careful attention to the cultivation and care of their beets, potatoes, beans, or whatever the crop may be. It is too late, of course, to plant a very large increased acreage of these things, but careful attention to the seed already planted will insure a greater production and, consequently, work up a supply to meet the apparent deficiency which will confront the country at the close of the present crop year.
Sugar's Part in the Nation's Task

From "Facts About Sugar"

Sugar, an important article of food in time of peace, is doubly so in time of war, both because of the energy contained in a pound of sugar as compared with a pound of other foods and because the conduct of modern war has developed many additional uses for sugar. Therefore, the sugar companies and farmers would be performing a patriotic duty by increasing the sugar output this season.

The above extract is from an appeal issued by the Secretary of Agriculture during the present week. It is not reproduced here because it contains any thought new to our readers. The same facts have been reiterated many times in these columns. We feel, however, that it is worth while to call special attention to the statement of Secretary Houston in order to direct the attention of the sugar producers of the United States to the importance, not only to themselves but also to the nation, of making their efforts count to the fullest possible degree toward a record production of sugar both this year and next.

The Secretary's remarks addressed primarily to the beet sugar industry since the cane crop of 1917 is already well advanced in the making. While the beet planting season is practically at its end, we are glad to be able to say, from reports received from the various beet sugar companies, that a particular endeavor to increase the beet acreage has been put forth without waiting for any official urging.

Production is not merely a matter of acreage, however. Much depends upon the care and attention given to the work of cultivation and harvesting. It is revealing no secret to say that in years past—every year—thousands of tons of sugar in the aggregate have been sacrificed through
failure of growers to give sufficient attention to the thinning and cultivating of their beets. Both in the beet and cane industries there has been much preventable waste in harvesting operations. With the high prices that the beet and cane growers are receiving for their crops they can well afford to devote to them the labor necessary to realize more nearly the maximum possible output from each acre. And at the same time they can have the satisfaction of knowing that they are doing their bit to aid their country in a war in which economic forces play a part almost as great as purely military strength.

A special opportunity is presented to agriculturists and fieldmen in this connection to see that growers in their sections have the full benefit of their advice and encouragement and that they measure up to the full possibilities of constant and well directed effort to produce the best crop they ever have grown.

While it is important for the grower to do his share by producing larger and better crops the mill and factory has a part to play as well in this great national campaign. Every manager, superintendent, chemist, engineer and other employee can do something toward the avoidance of waste and the increase of efficiency. There is much apparatus that can be replaced with new to advantage during the next four months; much that needs to be overhauled and tuned up. The study and adoption of better methods and the use of the best obtainable materials will not be wasted effort this year. We recommend for every mill and factory a special campaign, beginning now, to stop leaks and improve efficiency.

Here is the opportunity for every man engaged in the sugar industry to enlist in the national service. It is not a showy task, but one that will achieve solid and important results. We believe that the members of the American sugar industry are fully alive to their responsibilities in this respect. We have heard of many activities that go to show that this is the case. In Hawaii, for example, a special effort is being made to increase labor efficiency by bringing about more regular attendance by laborers who
have made it a habit in the past to absent themselves for a day or two a week. We note a suggestion by one progressive beet company to its growers that each one add a single acre to the amount he has planned to devote to beets this year. Another company has established a loan bureau through which it is extending financial aid to the growers in making their crop.

These are wholly practical undertakings and in the sum total they can be made to count greatly toward increased production.

Irrigate Promptly

From "Denver Field and Farm"

UGAR beets will stand periods of hot weather if there is ample moisture in the ground but when the moisture decreases, especially in the first few inches of soil so that it heats up considerably, the plants are apt to suffer. The outer leaves turn yellow and die and the crop begins to wither. The beets may, and usually do, revive over night and appear vigorous the next morning, yet if the hot dry weather continues and no supply of moisture is forthcoming, they turn woody, dry out and if small, burn up in the ground. Beets will wilt and show a yellow leaf here and there in land with plenty of moisture if the top soil becomes heated, but under such conditions will seldom suffer seriously and always make a good crop. Because our light soils dry out quickly the beets are apt to suffer more than in the better moisture retaining lands. While beets will survive sudden hot spells of weather, they are not desirable and the effect will be seen in a drawing out of the leaves and a yellowing in the color of the foliage and whatever happens it is very necessary to watch the irrigation closely and water promptly.
What Livestock Preparedness Means

T. E. Leiper
Colorado Agricultural College

LIVESTOCK preparedness means:

Not a hit and miss organization, but a well planned livestock farm.

Not more animals poorly cared for, but all the animals we can adequately feed and house.

Not all our fields in wheat or potatoes, but a large portion of the poorer fields in silage corn, or other fodders.

Not yielding to the tempting high prices of the present market, but the holding of our female stock for production next fall or spring.

Not a large growth of green feed in pastures and along our ditch banks covered by snow next winter, but the maintenance of a few sheep on every farm to use this otherwise wasted feed.

Not the abuse of our horses in the rush of the busy season, but time taken to care for their feet, shoulders, and teeth.

Not the sacrifice of business relations for immediate profits, but the cultivating of a strong mutual trust with our bankers and neighbors.

Not gambling on hay alone for wintering over our stock next season, but preparing against the long, cold season by building silos now and filling them next fall.

Not taking advantage of loyal labor, but showing our appreciation to those who work with us, by kind consideration and just rewards.

Not necessarily the adoption of new methods, but the strict operation of tried and proven methods of herd management.

Not indifferent co-operation with our county agents and livestock associations, but an active part in every move for better methods and community welfare.
The Early Cultivation of Crops

From "Field and Farm"

The man who grows the best crops is invariably the fellow who is out in the fields first with his cultivator and team. The early bird always gets the worm and the heavy maturing crop in late summer or autumn tells the good story. Young animals must not be stunted for lack of feed and good care during their first weeks of life or they will never recover and make the profitable animals they would have made had they had perfect care and feeding when young. It is absolutely the same with young crops. They must have feed and care during their first days of existence. If they must starve for plant foods and struggle with weeds for the first days of their life they can never be made to recover later in the growing season. A good start is more than half the battle with them.

Starting the cultivator early does not mean simply breaking the surface soil for preventing weed growth. It also means at the same time stirring and mixing the soil for letting in the necessary air to the tender feeding roots and for making the soil loose, friable and moist for them to reach out into for gathering large quantities of rich foods for rapid growth. Every time the cultivator shovels pass through the surface soil they break up hard particles for liberating more plant food that otherwise would not become available, hence some one has said that cultivation is equal to fertilization. Eternally stirring and mixing the field soil is the price of success in growing large crops.

Those who grow banner crops of potatoes and other roots jump right into them as early as the ground can be worked, and stay right with the crop till it comes to maturity. They do not wait for the weeds even to start, but every few days during the growing season the crust is broken and the soil stirred and mixed. The plants grow by leaps and bounds because the plants have air, moisture and abundance of soluble food to consume for large
growth. The crop is a success; early and frequent cultivation made it so. Every rain of consequence in summer packs the surface soil, forming a hard crust. This allows soil moisture to escape very rapidly at a time when the growing crop needs all it can secure. For this reason cultivating the crop as soon as possible after each summer rain or shower becomes a necessity.

Breaking the soil's crust breaks the capillary action of soil particles at the surface for checking evaporation. This hard crust broken up and reduced to a fine state by the cultivator acts as a blanket for holding the moisture below to feed the thirsty, growing roots of the crops. The more level the cultivation the less surface soil is exposed to the action of the sun and wind for complete drying out, hence the modern cultivators have several shovels to one of the old kind. The cultivator harrow is coming into extensive use as a dry-weather implement for running between rows as it creates a dust mulch and leaves the soil passed over almost completely level. It is a good thing in these days of abbreviated service that so many good machines have lately come in to help us out.

Until a few years ago many held that the deeper the cultivator could be run the more good it would do. Later growers began to use their imagination and reasoned that older plants had longer roots and as the crop grew the soil became more completely filled with them. To run the cultivator deep late in the season means cutting and breaking of many of the feeding roots and this cannot be good for the plants. When the plants are young the shovels may be run deep, for deep stirring and mixing the soil, but this deep working is best done, if possible, before planting so that it will never be necessary to work more than two or three inches deep after the crop is up. A good rule is to cultivate deep and fine before the crop is planted and to cultivate shallow and level while the crop is growing. But the golden rule for heavy crop production is to never let the cultivator stop from the time the first tender tips of the young plants appear above ground until the fruit begins to set. This is the royal road to the reward.
Wide Tires Make Easier Hauling

From “The Highway Magazine”

OR many years advocates of good roads have urged the use of wide tires on wagons as a means of reducing the needless wear of road surfaces. For as many years the average farmer has shown little inclination to adopt such tires. The most convincing argument in his case is usually one that presents a prospect of financial advantage, and there is a good argument for wide tires based on their saving to the farmer. In fact, it is a better argument for such tires than their service in protecting roads. It is based on facts ascertained by experiments made by the United States Office of Public Roads and Rural Engineering under the direction of E. B. McCormick, chief of its division of Rural Engineering.

How Tests Were Made.

An earth road was plowed up, graded and then rolled with a 10-ton roller weighing 450 pounds per inch of width of the rim of the wheels. A wagon was then loaded until the total weight on the wheels was 5000 pounds, and the pull in pounds required to haul it along the road was measured. The wagon was equipped with 1 ½, 2, 3, 4, 5 and 6-inch tires, and the weight of the loaded wagon was 883, 625, 417, 313, 250 and 208 pounds per inch width of tire for these different widths. It will be noticed that with the 1 ½ and 2-inch tires the wheels produced greater loads on the roads, per inch of width of tire, than did the road roller used in constructing the roads, so that it is self-evident that such tires will cut into a new road somewhat and are therefore undesirable. After each test and before the beginning of the next, the road was replowed, graded and again rolled, so as to have the conditions at
the beginning of each test as uniform as possible with an earth road. The tests selected for comparison were those in which moisture and weather conditions were identical.

Results of Tests.

The results of all these tests show that it takes a pull of about 91 pounds per ton of gross load when 1½-inch tires are used, 82 pounds with 2-inch tires, 74 pounds with 3-inch, 69 pounds with 4-inch and 66 pounds with 5-inch. With 6-inch tires the pull increases somewhat above that with 5-inch tires, indicating that for such a wagon and load there is no advantage in increasing the width of the tire above 5 inches. From these figures it will be seen that a horse must exert itself about 23 per cent more to pull the same load with 1½-inch tires than with 3-inch tires, and over 10 per cent more with 2-inch than with 3-inch tires. Any such steady, needless strain on the strength of horses, avoidable by substituting wide for narrow tires, is a waste of the farmer's assets which he will be quick to see when pointed out.

Width of Tires to Use.

The width of tires recommended by the Department of Agriculture is as follows: One-horse wagon weighing 2000 pounds loaded, 2 inches; light two-horse wagon weighing 3500 pounds loaded, 2½ inches; medium two-horse wagon weighing 4500 pounds loaded, 3 inches; standard two-horse wagon weighing 6800 pounds, 4 inches; heavy two-horse wagon weighing 7500 pounds, loaded, 5 inches.

With such tires not only will the farmer work his horses to the best advantage but he will also reduce the amount of money that must be spent to keep the roads in a condition for easy use. He will be a gainer in every way. He can haul heavier loads with the same team, he can haul the same load with less exertion than with narrow tires, and every time his wide-tired wagon goes over an earth road it will roll it instead of rutting it.
Cultivation Conserves Moisture

From "Denver Field and Farm"

Those who are unfamiliar with the application of water to crops may get a wrong conception as to the proper amount of water necessary to produce a good yield. With a copious application by the flooding method, the top layer becomes saturated and the usual result is a baked surface when the hot rays of the sun strike the moistened soil. This soil layer that has dried or baked under this condition possesses an infinite number of cracks and little pores or extremely small holes. The apertures act as so many tubes through which the moisture escapes like the blow-off in a steam boiler. Just like the oil in a wick when reaching the surface, the moisture evaporates and thus becomes a total loss to the use of the plant. With some soils, within a period of sixty to seventy-two hours after the irrigation flood method, the plants are suffering from the lack of moisture due to the capillary action. It is not more water that is needed so much as more cultivation, something that will break up the top layer and produce a mulch. Less water may be used to produce crops with more thorough cultivation.
EVERYONE wants to do his bit for the Red Cross. The farmers came out strong on Red Cross week. Some signed War Acre pledges; some gave money outright; some felt unable to help. The War Acre will enable you to do so. What you pledge under the War Acre is payable on or before December 1st., after your crops are marketed. The proceeds from the War Acre are payable to the Red Cross to be used by this organization wherever you say. You can designate that your contribution through the War Acre shall go to the war sufferers of any country now at war and the Red Cross will see that it is so expended. You can contribute, according to the size of your farm, an acre or less, of any crop you choose, turn this into cash and remit to Mr. J. A. Thatcher, treasurer of the Colorado branch of the Red Cross, Denver, on or before December 1st. You can contribute as a farmer, you can contribute as a fruit grower, or you can contribute as a gardener. All the information regarding the plan is printed on the back of the pledge. Get a pledge and study it. You can get them of Mr. J. H. Golden, secretary Farmers' Union; Mr. L. O. Thorn, Mr. O. C. Harris or Mr. C. L. Hover. The War Acre is the only plan that records what the farmers of Colorado are doing for war sufferers. All other methods of contributing to war sufferers do not segregate the farmers contribution from that of other classes of contributors.
THROUGH
THE
LEAVES

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NOTES

N. R. McCreery

The thing that is most on our mind at present is the delay in irrigating some of the late fields of beets. Nearly all growers irrigated their crop in good time and the beets have grown wonderfully since, but there are a few who have delayed the irrigation so long that their crop has suffered. If there was a shortage of water in the ditches there might be more reason for it, but this is not the condition.

+++ +

If your beet crop or any other crop is worth growing at all it is worth doing your best work on. We have been much impressed this year at the amount of dependence placed by the farmers on their beet labor to help them out when extra help is needed in haying and harvesting. Northern Colorado would be clamoring for help to take care of her bumper crops were it not for the beet laborer.

+++ +

In connection with the labor question, we would ask that if your labor has changed or there is any likelihood of shortage for your pulling and topping, that you advise us as early as possible, so we can have time to secure some additional help.

+++ +

This is one year when the advantage of early planting shows up. Beets that were well advanced by the time the warm weather came on are making a fine growth, while the late plantings have been having a struggle for existence. This emphasizes the value of “Fall Plowing,” because we cannot tell what the spring weather is going to be. Now is the time to get ready for Fall Plowing.
We are just in receipt of a report from our Denver office in which we note that there were fed at Longmont Factory last year 13382 head of cattle. The next largest number was at Fort Collins where 10354 head were fed.

Of the number fed at Longmont 10913 head were fed on farms and the remainder in the Factory feed lots.

The Sugar Company is rather partial to mules for their farming operations, and not being able to secure such stock as were desired in Northern Colorado, sent Mr. Pace down to Missouri where he purchased a car load of good stock. Mr. Pace advises us that the government buyers are cleaning the country out of all surplus stock and that if we don't raise more horses and mules we will all have to go to farming with Fords.

PULP FOR 1917

We wish to advise that everything else has been going up so much and so fast that the price of pulp would not stay down any longer. It has started rather late in its climb, however, and will not attain to the same heights some other commodities have.

The price for 1917-18 feeding season will be 75c per ton for the first 30 days of the campaign and $1.00 per ton thereafter. This is a raise of 25c per ton, but compared with other feed stuffs it is still far below its real market value and much below the price it could be sold for were we disposed to sell to the highest bidder.

The rules for distribution will be much the same as last year. We have studied these from all angles and are unable to see where much change can be made. Each year there have been those who apply for pulp with the hope of disposing of it in one way or another. Some feed it, some do not, but it makes it hard to calculate our distribution accurately and is unfair to the regular feeders. We have decided this year to require a deposit of $1.00 per acre of beets with the application. This will be applied
on the price of the first pulp hauled and is for the protection of the bona fide feeder. The company has no interest in requiring this deposit except that we believe it will help the feeders.

The rules, therefore, are as follows:

All pulp applications must be returned to us by September 5th accompanied by $1.00 per acre of beets grown by the applicant. If any grower advises us by November 1st of his intention not to feed we will refund this money.

No combinations of any kind will be allowed after allotments are made. If two or more growers intend to feed in partnership their applications must so state. To any grower to whom an allotment is made will be allowed to feed his pulp at any place he desires so long as he feeds to his own cattle. Any outside feeder must feed the cattle on the farm where the beets are grown. Any effort to dispose of one's pulp except as above will render the allotment void.

All growers expecting to use pulp must have their cattle purchased by December 1st and on pulp feed not later than December 15th in order to hold their allotment.

Payments must be made on the 15th of each month for all pulp hauled during the previous month. You will find a card enclosed with this book. If you want an allotment of pulp send it in by September 5th with your check for $1.00 for each acre of beets you have. We positively will not allow any pulp to parties whose cards are not received by that date.

+++

MOLASSES

Molasses is a by-product that has no national market value. It goes into the manufacture of feeds and various other commodities, all of which are affected by the changing market prices. Last year we furnished you molasses at $10.00 per ton, while at the same time we were being offered more than $20.00 per ton for our output on board cars at the factory. The demand is still greater this year.
and the price we are offered is $30.00 per ton and better f. o. b. factory. We are interested in helping the local feeding industry and are going to make the local price $25.00 per ton for this year which is at least $5.00 per ton below what we can sell it for.

Even at this price, if you will stop to consider its feeding value as compared to corn, you will find it a cheap feed. With probable high prices of hay you will want to use up your stack bottoms and the stems from your mangers and nothing will help this so much as a mixture of molasses. We know if you will compare frankly its feeding value you will see its place in your feeding ration just as much as before.

## Our Agricultural Fairs

From "Successful Farming"

It is important that all state and county fairs be held this year as usual and the attendance kept up to the usual standards. The livestock interests are in the balance, and it is hoped they will not be weighed and found wanting.

The United States has become the breeding ground of all stock improvements. The herds and studs of the old world have been largely demoralized by the war. Everybody must look to this country for its future supply of breeding animals. To develop our breeding stock to their utmost there must be the competitive contests in great fairs.

Agriculture is now recognized as the one great industry which will win the war if anything can. Every eye is turned towards the farm. Now as never before will the fairs speak to the people in a common language of interest and necessity. Attend the fairs, and exhibit your products.
Why?

A. C. Maxson

WHY do many beet growers allow their beets to suffer for water before they apply the first irrigation? There are three prime reasons.

1st. When the beet sugar industry was in its infancy the growers were taught that by allowing the beets to burn they would go down after moisture and make a long beet and a good yield.

The writer visited one of the men in 1914 who advocated this burning method of producing beets in the early days of the industry in Northern Colorado. In the course of a conversation this man, who, by the way, is at the head of the agricultural department for one of the leading Sugar companies of the country, was asked what he thought of allowing beets to wilt badly before applying the first water. His answer which was very emphatically made was, "I forgot that years ago."

This man’s followers in Northern Colorado have not forgotten it, so many crops of beets are not as large or profitable as they might be.

2nd. Articles have appeared in the agricultural papers from time to time and bulletins have been published which taught against early irrigation on the basis that early watering produced short, turnip-shaped beets and beets of low yield.

The writer is not saying that early irrigation does or does not produce turnip-shaped beets. That is not the point. The heaviest crop and the one that returns the most money to the grower is what we want regardless of the shape of the individual beets.

In the writer’s experience the shape is not influenced to any noticeable degree but the yield and sugar percent are.
We have reached the point now where we can tell in advance when early irrigation will give best results. As has been stated in a previous number of this paper, when the rainfall for the winter and early summer is light, early irrigation is best; when it is heavy later watering gives best results. When we advocate early irrigation it is based on this knowledge together with the general crop conditions.

3rd. We try early irrigating and the yield is not as good as it was last year and we blame the early watering. This is quite apt to lead to the drawing of incorrect conclusions. Take 1916 for instance. Many growers heeded our early irrigation talk. Some were convinced and others were not. The latter did not get as good a yield as in 1915 so of course the method of irrigation was at fault. As a matter of fact not a single Northern Colorado factory territory had as good a yield in 1916 as 1915. Unless a grower tried both early and late irrigation and kept his records of the two accurately he has no right to say that the lowering in yield is due to the watering. No two seasons are exactly alike so the comparison of crops grown in two seasons shows very little beyond the effects of the season as a rule.

Why did we withhold our water this year? Mainly because the rain in May gave many the impression that we were experiencing a wet season. This was not the case, however, as the total rainfall for the winter and early summer was not nearly as high as in 1915.

The Great Western Sugar Company has no desire to see you raise a poor crop of beets, but on the contrary, wants you to raise a good one. Why? Because they know that the crop that yields you the most money also is best for them.

Do as the agriculturalist mentioned has done, forget the early teachings that have been proven wrong, take the advice of the Company's field men and we are sure that your results will be better. Of course any losses due to sloppy methods in the field are up to you. Follow our advice and do your work well and we will risk your results.
The County Fair in War Time

D. W. Thomas

The chap who started the slogan about "Business as usual," made a bad guess. Nothing is usual this year. Our job is war. To successfully conduct that war we have to distinguish between essential and non-essential business. Everything connected with agriculture is certainly essential. The fair is essential. The truths which the fair has been trying, since its inception, to hammer home by precept and example are now being boomed around the world.

"Are we going to have a fair this year?" someone asked. Why not? This is not the time to take in the slack—not this kind of slack, anyway. It is the time to let out, to expand, to hit with both hands.

The fair has earned a pretty bright reputation and earned it honestly, earned it by the will and power of the people. That reputation is too good to lose, and we don't intend to lose it. We are going after every record we have ever made, and we intend to break them all.

It is but human to be attracted by the glitter and tinsel, and we grown-up kids cannot be blamed perhaps for sometimes judging a fair by the noise it makes. But for your information this little "info" is handed you—the amusements and games, and what-not are to the fair as the color is to the flower. Were it not for the attraction of the color, Mister Bee would go loafing on his way and never stop to investigate the nectar that lies hidden.

There are twenty-four different departments to the fair, each separate and distinct, yet all dove-tailing into a
smooth-working organization of the whole. That is where the results come from. Each department cherishes the ideal of betterment—better living, better making of a living, better enjoyment of living.

Instead of letting up because this is war year, each department is lengthening its stride a little. All are striving for better administration and many are adding new features and attractions. Timely cooking and canning demonstrations and a stock judging contest will be held. New and attractive exhibition features will be installed. The entertainment program is being brightened till it sparkles, even though it pleased immensely last year.

The Boulder County Fair is playing a big game. Not content with being a county fair, it is determined to be THE county fair. Already other counties are coming to us to find out how things are done. We always tell them cheerfully, then fool 'em by doing something more so they can't catch up with us after all.

The fair is one of our greatest agricultural assets. It is made more so by reason of our present war conditions. Its main object is to promote the agricultural interests of Boulder and adjoining counties. It is a place for the exchange of ideas of mutual profit and benefit. The paramount idea is the promotion of agricultural and educational interests. Bear that in mind.

It is a hard job to handle a real fair as it should be handled. Part of the fun is to fuss with the gatekeeper, quarrel with a judge now and then and stir up any old officials there. But don't go after them too hard. Blanket instructions to all officials are that they are to strive to please the people. Give them a chance. War is the big topic these days, but let's not practice up on it in this way.

"Better and Bigger than ever," when spoken of in connection with fairs, shows, circuses, and such, is very apt to become a platitude, so we use the expression with reserve. But that is what we mean, anyway. "The Fair Beautiful," is a designation that not many fairs have the courage to claim, but Boulder county claims it honestly.
The Cost of a Bushel of Wheat

Geo. M. Young

What is a fair price for a bushel of wheat? This is a reasonable and proper question at this time when the farmers are asked to produce more. A few years ago it was found that an acre of wheat in York state required twenty hours of man and thirty hours of horse labor. In Washington 17 hours of man and fifty-eight hours of horse labor. Minnesota was the lowest in labor cost, but there it averaged ten hours for the man and twenty-three hours of horse. In other words it was one full day of a man and team for an acre of wheat and this is not on the basis of union hours either. A man and team at that time could be hired for $5.00. Now the cost would be at least $7.00 for a ten hour day. An acre requires a bushel and three pecks of seed and at $2.50 a bushel, which is less than the market price at seeding time this year, the seed cost for an acre is $4.37. If the land is worth $50 an acre—the average value—the interest at six per cent amounts to $3.

In those days it required about $1,600 for equipment including horses for 160 acre farm, or $10 the acre. The cost at present market prices will be nearly double. The equipment will wear out every five years on most farms, but we will figure it on the basis of seven and a half years, showing a depreciation of fifteen per cent, amounting to $3 an acre each year with an interest cost on the equipment of $1.20. This makes a total cost for these items alone amounting to $18.57. But we have not yet included the largest item of cost which is the fertility elements taken out of the soil by every crop.

Now taking $18.57 as the cost of labor, interest and depreciation in producing an acre of wheat and adding $9.45—the fertility loss in 15 bushels—we find the farm cost is $28.02 the acre. To this must be added the haul to the rail-
road at six cents a bushel or ninety cents the acre; average freight to the terminal market, twelve cents the bushel or $1.80 the acre; commission, one cent a bushel or fifteen cents, making a marketing cost of $2.85, which brings the total cost of a fifteen bushel crop up to $30.87 the acre or $2.06 the bushel. These figures are indisputable. Is it any wonder that official statistics show that in the last census decade, while there was an increase of population amounting to over twenty per cent, the increase of wheat yield was less than four per cent in spite of better farming and that there were 8,325,982 fewer acres devoted to the grain in 1909 than in 1899, an average decrease of 158 per cent? Is it any wonder that the cost of wheat to consumer is increasing? If we are going to increase food production it must be made worth while to grow more. This cannot be accomplished by patting the farmers on the back and saying how patriotic a thing it is to grow wheat. We do not expect the munition factories to make shells at a loss because the owners are such good patriots. Why should farmers be rewarded with buncombe?

**Meteorological Report**

**JUNE 1917**

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**Precipitation:**

- To Date | 8.22 |
- For Month | .28 |
- Greatest in 24 hours | .26 on 4th |
- Departure from Normal | −1.53 |

**Number of Days:**

- Clear | 16 |
- Partly Cloudy | 13 |
- Cloudy | 1 |

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Colorado's Queen--Alfalfa

H. H. Griffin

Alfalfa may justly lay claim to being Queen of Colorado crops. It is hard to conceive what our agriculture would be without it. It is readily established under our soil and climatic conditions (especially under irrigation) and when once established is easily maintained. In fact, it seems to fill the bill in every particular as one of the crops to be grown on irrigated farms. The fact that it is so easily established, perhaps, makes the farmer careless and is the main cause of why better results are not secured.

Having these natural qualifications to make it one of the best crops to grow, why is it that we fall far short of producing the amount of hay that we should and, by so doing, fail to add in other ways to the agricultural productions of the state. I think that it can be safely stated that "Around the Horn" it does not average three tons per acre. When we compare this yield with 5 tons per acre that is sometimes secured, it is safe to say that not nearly as much alfalfa is produced each year as it is possible to produce. Perhaps the abundance of it in the past, and the consequent low price, has been another reason for not enough pains being taken to produce a crop of such magnitude as conditions will justify.

The facts are, that there is less attention paid to getting a maximum crop of alfalfa than of any other crop grown in Northern Colorado. Alfalfa being a crop, which, when once established, is to remain for a considerable number of years, should have the utmost care taken to secure a full and complete stand at the time of seeding, for there is no way of successfully remedying the deficiency after the first year and, unlike some other crops, a full yield cannot be secured, of the proper quality, without every foot of available space being covered. The quality of the hay
also depends upon how thickly the plants are grown. To get a complete stand then, at its inception, is very essential. Some farmers think this may be attained by putting on a large amount of seed, say 20 lbs. per acre. The efficacy of so doing is then often destroyed by trying to raise a full size grain crop, terming it a nurse crop, or by burying the seed so deep in the ground a little plant cannot get to the surface, or by a combination of both methods, making the stand thin.

In trying to get a full crop of grain the little alfalfa is shaded too much and crowded to such an extent that it cannot develop, but remains a spindling plant, all through the first season. Probably the greatest harm comes to the alfalfa after the grain is cut, as it is a practice to shock the grain and allow it to remain on the ground from one to two months before threshing, which prevents irrigating the land. The small, spindling plant thus has to fight for its existence at just the time when it should have abundance of moisture and be growing and stooling for the following season.

I do not believe there is anything gained by using the so-called nurse crop. It is true that if grain is not grown weeds will grow in the young alfalfa in vast quantities, but they can be cut at any time and as often as it becomes necessary to give the young alfalfa full opportunity and each time the young alfalfa is cut, new strength is added to it by making it more stalky and compelling it to stool. By this method the grower is not compelled to hold off the cutting or irrigations until such a time as the nurse crop will permit, but may treat the alfalfa in such a manner as will be of advantage to it instead of the crop growing therewith.

By handling the crop the first season in such a manner that the interests of the alfalfa are taken care of rather than that of some other crop, the alfalfa will go into the winter in the most favorable condition possible and start
the next spring healthy and strong. Alfalfa started this way will far outstrip, in the second spring, that grown with the nurse crop and will produce the second and third years much more hay; more than compensating for the grain crop and giving a full and complete stand for future use.

If, however, a nurse crop is used, barley is the best grain to select, for the reason that it grows quickly. Sow it very thin, about one-half bushel to the acre, running the drill rows north and south, if possible, to admit the light. Harvest as early as possible and at once take the grain from the land and irrigate.

Another thing quite essential is a shallow planting of alfalfa seed, about one-half to three-fourths of an inch deep, but the most essential thing is to firm the soil to the seed. If a press drill is used the work is accomplished fairly well, but a roller is very desirable. With the shallow planting and firming of the seed, ten or twelve pounds of seed is ample. If rains do not occur, irrigation can be resorted to and a thick stand secured.

In addition to securing the best possible stand one should look well to the remedying of other sources of waste, one of which is making the stacks too small and too numerous, thereby exposing many tons of alfalfa to the weather, where it becomes of no value for feed. Often times we see little stacks of only three or four tons standing side by side, where easily both of these could have been taken care of in one. Or by going a little farther with the rakes and taking a little pains in the stacking, much hay can be kept in good feeding condition. We are also disposed to leave our alfalfa fields stand too long upon which the stand becomes thin and the yield correspondingly light. An alfalfa field in May should show a green head instead of a yellow one, from the dandelions that may take its place. When an alfalfa field comes to this point it is time to plow it up. The time has come when alfalfa is so valuable that the utmost care should be taken to get it started right and avoid all manner of waste so long as it is the crop that we are expecting to take from the land.
Prevention and Cure of Sore Shoulders and Necks of Horses

W. Harding

Sores on the necks and shoulders of horses are always a source of trouble and annoyance in farming operations resulting, of course, in a loss in efficiency in that line. We have been very successful in curing sores by washing the shoulders of the horses immediately after the collar is removed, with a strong salt water solution which will have a tendency to toughen them and take out any soreness. A liberal application will remove swelling.

When bunches form on the necks and shoulders, if they are not immediately removed the skin will soon peel and the sore be very hard to heal. These bunches may be taken down by a little spirits of camphor applied very lightly to prevent blistering. We have also used some gall cures with a certain degree of success, especially “Security,” from which we have obtained very good results. It is important, however, to keep the sores clean with an antiseptic of some kind. We use peroxide. The sores are then also washed with salt water when the teams are unharnessed in the evening, and a gall cure applied when harnessing. Don’t at any time, allow dirt to gather with the gall cure, which will only cling to the collar and increase the sizes of the sores.

Our observation has been, that the principal means in the prevention of sores, is to obtain collars that are well fitted to the horses. A horse that is idle for a short time will fill in at the neck even if it does not increase much in weight and the same collar that was used on the horse formerly will be tight after a lapse of idleness. A collar
that is too short will cause a sore to form on the top of the neck, and one that is too long will make the points of the shoulders sore; and a collar that is either too wide or too narrow will cause sores on the side of the neck. Even a well-fitted collar will cause soreness, if the collar itself and necks of the horses are not kept free from dirt.

Much trouble along this line can be saved if, before harnessing, the shoulders and necks are rubbed freely, which will tend to remove any slight swellings or soreness. Also on stopping the team, the collars should be raised and the necks and shoulders of the team rubbed with the hand and aired, which will keep them smooth.

Parasites

G. A. McMurdo

"Great bugs have little bugs,
Upon their backs to bite them,
Little bugs have lesser bugs,
And so ad infinitum."

This is the time of the year when plant lice attract considerable attention to themselves because of the aggregate damage that their large numbers inflict on vegetation. They reduce the income from agricultural investment and we cannot help but feel a sort of contempt for the little insect because of the way it makes its living.

Plant parasites take a heavy toll of life in the plant world and in self-defense we should make war on them by all the approved means at our command.

The human family has its parasites. Some of them would put the plant louse to shame in a contest to determine which makes a living in the most detestable manner. There is an old saying, "There is so much good in the worst of us and so much bad in the best of us that it hardly behooves any of us to talk about the rest of us."
But some people try to hide their own littleness by pointing out flaws in those around them. Anyone can attract attention by shooting out the lights. Anyone can talk and gossip about his neighbor, his co-worker, or those in authority over him. Anyone can attract attention by such parasitic methods of making a living. Anyone can stay with the bunch at the top just as long as he can kick everyone else down.

The plant parasite is controlled by methods based on a study of the way it makes its living. The human parasites are controlled in the same way. We wait until a particularly strong kick causes them to lose their balance and then give them any needed help to find their proper level.

The man who climbs to a position of trust and influence in the community by steady consistent effort does not have to resort to kicking others down to hold his position. We respect and honor the man who practices, "Live and Let Live." We pity or despise those who persist in trying to make gains at the expense of others.

It should be a source of pride to us when we have a prosperous farmer for a neighbor. Continued fault-finding, because he is more successful, will not make us any better off. The large investment of capital required to conduct many lines of business is a subject seldom discussed but the unjust profits are a never ending source of gossip. We fail to see that prosperity in one business or in one branch of a profession has an upward pull on all the others.

Instead of putting so much effort into making a living at the other fellow's expense, why not all pull together. The Longmont district has many examples of commendable co-operative spirit. It has many individuals who are worthy of emulation. There is, however, some room for improvement and perhaps some of us will not have to go far to find that opportunity.
The Soil We Till

J. F. Jarrell

(Continued)

We hear a great deal these days about scientific farming and efficient farming. Some farmers when they hear the above terms used, sink into their boots and are too dumbfounded or too timid to peep out again while in the presence of the speaker or even until they reach home and begin to feel secure in their own barnyards where they can exercise their authority over pigs, cows and horses. Then they begin to have a normal pulse and when thinking over their farm problems they usually come to about the following conclusion:

"It is entirely too deep for us."

After all scientific farming is only proper farming, and efficient farming is correct farming. Some of us get scared at words and terms which are toned up and high sounding. We tremble and stutter around fearing that we might appear to a disadvantage and that some one might not be able to identify us as farmers. Our big problem is "The Soil We Till," and it does not take us long to determine the nature of the soil even its chemical composition and humus content. After these are known we begin to think about the best crops to grow. This is a very important question and requires careful study in order to obtain the best results. This differs some on every farm, although some sections as a whole will prove especially well adapted to some certain crop. In these places we will find usually soil of a uniform type, which only goes to show the importance of the proper crop being planted on proper soil.

In the laboratory we are able to study plant growth of the lower as well as the higher forms. We can determine what a certain plant needs for nourishment and in a gen-
eral way apply what we learn to the growing of farm crops.

In the field we have many more uncertainties to contend with, also more is at stake; often a failure means financial ruin.

In the laboratory if we wish to grow a crop of a certain bacterial flora, we first prepare the proper media on which to grow the culture; if this is not properly done we cannot expect to obtain the desired results. So on the farm the soil is the media, the seed we plant are the germs with which we inoculate the soil. A poor seed bed, a poor soil, poor cultivation and irrigation cannot produce the desired result—"a good crop." On the other hand a good seed bed, a good rich soil, proper cultivation and irrigation will produce the best results.

Then what do we have to know to be scientific and efficient farmers?

Know your soil, know your farming implements, know yourself and your hired man, know the proper crops to grow, how and when to plant, how and when to harvest, and where and when to sell.

You will say that it requires a very broad knowledge in order to farm successfully. Yes, it does, but look around you and you will see men doing the thing scientifically and efficiently, even though they do not realize it themselves.

Some are college trained men and have finished a course of study at the State Agricultural College; others are farm trained men and have had a thorough course of training at Hard-Knocks University. Both are succeeding at farming, both are solving the same problems arising from "The Soil We Till."

Some farmers at times feel as though the soil on some other farm or in some other state is better than their own. Of course this is true in some cases, but usually your soil will respond to proper treatment and improve with tilling. This is especially true if you grow the proper crops, feed all the stock you can on the crop you grow and spread manure. Rotate your crops in such a way that all fields will be well tilled throughout the rotation. Grow crops
which have to be hoed, thus reducing to a minimum the weeds which rob the soil of valuable ingredients without making any returns except unfavorable comment by those who see them.

Till the soil and it will support you abundantly. Don't be ashamed of yourself if you have not had the advantage of an agricultural training, but buckle in and do your best. Should you hear any discussion which seems too deep for you, just absorb all you can of it, keep a stiff upper lip and continue to till the soil and teach the boy to do the same. Perhaps you can afford to send him to the State Agricultural College where he can learn many things which will help you as well as himself to till the soil better.

Autobiography of a Beet

(Continued)

T was early in June when I made my last decision to live and grow into a large beet.

I thought that I had passed the stage of attack of infant diseases, but this was not so. A severe attack of black root had threatened my very existence. I became gaunt and thin and my skin took on a dark appearance. But my heart remained sound. The fresh air which was so necessary for my complete recovery came very slowly through the soil because the owner of the field in which we were growing had not stirred the top surface deep enough the first time he had cultivated it. Most of the other beets in the field suffered in the same manner.

Finally I recovered. My growth had been stunted a little and the disease had left its mark. Could I have had more fresh air my recovery would have been faster and more complete.

It was two months since we had been placed in the ground. Now my leaves stood about five inches above and my roots extended more than fifteen inches below the
surface. We were all wishing for rain. A few of my nearest friends succumbed to the drouth. Many of us lay almost flat on the ground during the heat of the day, our leaves scorched and blistered. At night we straightened and refreshed ourselves as best we could.

The owner of the field had stirred the soil between us several times since his first belated attempt to kill the weeds. Finally we noticed that he used different attachments on the machine with which he stirred up the ground. The new attachments were larger than any he had used before; they did not dig into the soil very deep and left small trenches as they passed, piling up loose soil over a few of our lower leaves and around our feet. We were thankful for the additional protection to our roots from the sun, and became even more grateful when later the man turned a small stream of water into each of the trenches. This he allowed to run until the soil over the entire field took on a fresh, dark and mellow appearance.

Then we drank our fill. Our leaves brightened, we held up our heads and stretched ourselves as much as possible. In a few days the owner of the field again stirred the soil between our rows so that air could get to our roots. He had been told that we needed air at all times in order to grow. The same large tools which left trenches, in addition to some smaller ones, were used on the stirring machine.

Our growth now was very rapid. A few small insects—root lice—had made their appearance in the field a short time before but the water which came down the trenches had drowned them so that we had nothing to worry about except to make a rapid growth. How we did take advantage of that opportunity! Soon our leaves shaded most of the space between the rows. We reached across and jostled one another in friendly rivalry to grow faster than any other beet in the field. We were happy; we were growing, growing and hoping that our owner would not neglect us and would watch carefully so that we would get another drink as soon as we needed it. —E. H. H.
Advantages of Fall Plowing

Grant Hartman

By plowing our ground in the fall we get a much better seed bed for our spring crop, whatever it may be, than by spring plowing. This is especially true for beets. Plowing in the spring is all right if the conditions are right, but so many times the ground is either too wet or too dry. By plowing in the fall we do away with taking this chance. Even if it is dry in the fall it is best to plow anyway. By the time it lays all winter and Jack Frost works on it, and it receives the winter snows, it will be in good shape in the spring. If it is cloddy in the fall it will pay to roll or harrow the ground in order to mash the clods down.

Another advantage is that one can plow deeper in the fall than in the spring with good results. This is important in growing good crops. Two or three inches of new soil turned up in the fall, after it has frozen and thawed, will not bake and crust like it will if turned up in the spring.

By having ground plowed in the fall one can get crops in much earlier which will insure a better crop. It will enable one to start the year's work with everything caught up and to do everything during the whole summer when it should be done. Sometimes when it is a wet spring and there is lots of plowing to do, one gets behind and never gets caught up all summer.

Another thing: it is a big advantage to those who are feeding stock to have their plowing done in the fall. Then all they have to do in the spring is to plant the seed. This will not interfere with the feeding nearly as much as if one has to do the plowing.

My way is to leave the manure alone in the spring and as soon as the threshing is done in the fall, spread the manure on the field and give it a good deep fall plowing.
Getting the Farm Work Done

From "Hoard's Dairyman"

This is the title of Circular 76 issued by the Agricultural Extension Service of the Wisconsin College of Agriculture. It embodies the thought and experience of a Wisconsin farmer whose name is not given but it is a most valuable and practical piece of suggestion all the way through. This farmer has 160 acres of land and by his wise forethought and planning finds it profitable to keep two hired men the year through. He says:

Every paper I take up has something in it about the great need for more food and I guess there is something to it, for we must feed a lot of people in Europe as well as our own growing population.

Naturally enough I feel the need of having more to sell at the prices which conditions seem to promise. I have been thinking several cold days this spring, as I rode the gang plow behind four big horses, plowing sod for corn, what I could do to help out.

One of my neighbors said one day, "What's the use of plowing in such cold weather? We are going to have a late spring and there will be lots of time to plow."

Keeps Ahead of Work.

But I just told him to remember how cold it was last spring until long about corn planting time, and how it turned off warm and he still had to plow his big sod field before he could plant it. I asked him if he remembered how the horses on the gang plow lathered and puffed and had to rest part of the time because the sod had grown tough and the weather was warm, and the horses hadn't been hardened up by continuous work.
I made that mistake once, too, but you bet I won't do it again if keeping the plow going whenever the ground is fit to plow will prevent it. Those cold days were great for plowing sod and hardening up the horses for the summer's work.

Busy in Fair Weather.

I have been trying for several years to work out a plan that will help in getting the work done. The great thing is to get everything done at the right time and to keep the odd jobs out of the way of the field work. The plan which has been helpful to me may be useful to others who haven't a plan as good or better, and if anyone has a better one I want to know about it for I'll adopt it at once. I believe every man who reads this can improve the plan, and I wish he would.

Uncertainty of the weather and the shortness of the season in which to do a lot of things make farm management difficult. This plan is one for keeping pace with the seasons and making the most of good weather.

Field Work Comes First.

Rule 1. Field work must have all the time the weather and soil conditions will permit us to give it. This is the work which determines the amount of food we can grow. Nothing, except necessary work like feeding and milking, should be allowed to take us from the field work and it should be planned where possible to get the milking done and keep the horses working ten hours a day. The best farmer is the one who gets the other work out of the way and keeps the teams moving whenever the land is in condition for field work.

Wet-Land Work Fills In.

Rule 2. There is a lot of work that I call wet-land work; in this class falls the cutting of weeds and brush in the fence rows, the repairing of fences, the cleaning up of the wood lot, the repairing of buildings, the laying of concrete walks, the digging of trenches for laying water pipes from
the well to the house and to the barn, and a score of other tasks which should be jotted down in a note book as they are thought of, and done when field work cannot be done. The rule is: "Plan no wet-land work when there is work in the field which can be done."

Jobs for Rainy Days.

Rule 3. There is a great variety of work which we can do under shelter and which we should do on rainy days. Shelling seed corn, mending the harness, and repairing tools are typical examples. If these matters are not cared for in rainy weather, they are in danger of stopping field work just when the time of men and teams is worth the most. It is necessary to have some means of thinking of these tasks when the rainy days arrive or we will let these golden opportunities slip by unimproved.

One farmer I know keeps his notebook in his pocket to jot down the tasks which can be performed on a rainy day. This enables him to plan quickly the work for a rainy day. In planning rainy day work, do first the jobs which are in danger of getting in the way of the next dry weather work. The rule is to leave no rainy day work to be done when it is not raining, for in this climate our profits are limited by the amount of outdoor work we get done.

Work With Nature.

We farmers work with nature and must keep pace with her if we are to expect good crops. I have often thought of my work as "rush work" and "get-out-of-the-way work." My problem is to make all the odd jobs which can be done most any time of year if I can get at it, keep out of the way of the field work and the regular work in the dairy.

Rush Work Calls for Long Days.

Rule 4. Feeding and milking dairy cows, sowing oats, planting and cultivating corn, and harvesting oats are examples of work which suffer if not done at the right time. If we neglect our cows we shall soon have no milking to
do. If we delay sowing oats until the warm, dry days of late spring, we will have a light harvest, and if we put off cultivating corn for one week after it is large enough to cultivate, the fields will be weedy and the crop poor. This class of work is rush work on my farm, because the profits depend upon doing as much of it as possible, and doing it well. In rush seasons we put in long days, expecting to ease up on rainy days or when the rush is over. At these rush times we follow the rule “do nothing today which can as well be put off until tomorrow”.


Rule 5. Work which we can do at any time within a wide latitude requires our very special attention, because the time comes when this work cannot be put off longer and it may stop the rush work. For example, seed corn may be tested and shelled any time after it is thoroughly cured, but if the work is neglected until the fields are ready to plant, then that most profitable work in the corn field may be delayed. This may be called “get-out-of-the-way work.”

It takes more planning, more thinking, and more force of character to do this work in seasons when there is no rush work to be done than it does to concentrate on rush work, for the season calls us to the rush work, while it is only by using our heads that we can get the other sort of work out of the way in advance.

The rule I try to follow when there is no rush work to be done is found in the old phrase: “Put off nothing until tomorrow which can be done today.” We must apply this rule methodically and with industry if we are going to get ahead very fast. My note book in which I jot down the odd jobs which should be done has proved helpful to me.

These rules have been working themselves out in my mind during many years of experience. They have been useful to me. If they help you I shall be well paid for the trouble of writing them out.
The Fieldman, Beet Grower's "Guardian Angel"

J. A. Brock in "Facts About Sugar"

A Neglected Factor

With the rapid growth of the beet sugar industry in the United States considerable attention has been given to the various factors which go toward making this particular industry one of great value and importance to the various sections of the country where sugar beets are grown. Writers are constantly pointing out the direct returns from this crop as compared with those from various other farm crops. Others have called attention to the great indirect benefits to be derived in the form of increased yields from the crops following beets, while many writers have pointed out the value of the beet crop by-products, such as tops and leaves. No one will deny that these are important factors and that they have been largely instrumental in advancing the beet sugar industry in this country.

There are, however, many other factors which are of as great importance, but which for some reason have not been pointed out; among these are the various community benefits which have come as a result of the beet sugar industry. The space available for this article would not permit the mentioning of all the various benefits which might be classed as "community benefits"; the writer, therefore, will deal with one which has been almost entirely overlooked. This is the great benefit to the beet growing community which comes as a result of the labors and advice of the fieldmen employed by the various beet sugar companies.

Value to Community

There is, perhaps, no body of men of like number in the United States which is contributing more to the agricul-
tural success and development of this nation than the fieldmen of the beet sugar companies. They have been called the “guardian angels” of the beet farmer and the term has been well applied. The average fieldman is recruited from the ranks of the practical farmer, and it has been the aim of practically every beet sugar company to secure the services of the men best fitted for the work.

His Many Responsibilities

The fieldman’s position is one which carries great responsibilities, for upon his advice may depend the success or failure of the company in his particular territory. He must be a man who understands every phase of farming and one who has had the practical experience which, in the final analysis, is the prime factor to be considered. He must possess ability in the handling of men. He must have the respect of the growers. He must stand high in the sight of the farmer in order that his advice on agricultural subjects may be heeded. He must have a personal knowledge of practically every acre of land in his territory. He must know how to select the proper field for beet cultivation. He must be thoroughly honest. He must have the faculty of pleasing the farmer and must be able to settle the minor disputes which occasionally arise between his company and the grower. In addition to his knowledge of sugar beet cultivation, he must have working knowledge of green manures, fertilizers, the rotation of crops, the feeding of cattle, and kindred subjects. He must be able to advise the farmer on almost every subject and problem of his occupation. Upon his ability along this line depends the benefit derived from his presence in the community.

Adviser to Growers

He must also, of course, have a thorough knowledge of the handling of beets both at the weigh stations and in the factory yards. He must have a knowledge of the economic questions relating to the sugar industry, for he is continually being asked questions along this line by his growers.
While it is true that some of the companies have not as yet devoted sufficient attention to the selection of their fieldmen, they are rapidly coming to it, and the incompetents are being fast discarded. The companies are realizing that the greatest asset they have is their agricultural staff, a large portion of which is made up of fieldmen. In speaking of the community benefits of the fieldmen and the service they render, a leading banker recently told the writer that "the fieldmen of the --- Sugar Company have done more for the agricultural development of this county than any other group of men," and that he considered them "one of the most valuable by-products of the beet sugar industry," both to the farmers and the business men of the community.

A Labor Problem

From "The College Farmer"

Farmers complain for about three to six months in the year of the great difficulty of securing labor. There are six months in the year in which, as farming is conducted now on most farms, they can find no employment for men even at board wages. No man can live in these days by working six months in the year, and the farmer should not expect to get efficient help for six months when he cannot give the man work for the other half of the year. There is a great demand for laborers during the haying and harvest seasons, but after the threshing is over the farmer is quite as anxious to get rid of extra labor as he was to get it at the opening of the season.

Manifestly, there is no way of solving this problem except by reconstructing our farming operations so that the farmer who needs labor can employ it the year round. This involves going in the livestock business; or, to put it in another way, the farmer should regard himself as both a producer and a manufacturer. His business during the summer should be producing raw material, and in the win-

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ter manufacturing it into such condensed products as beef and pork, and butter or milk or cream all the year 'round.

Many farmers think they would be in an agricultural paradise if they had cheap and efficient labor all the year. Looking at man in his social and moral aspect, we think he would be in anything but an agricultural paradise. For if labor were cheap and abundant, the small farmer would absolutely be put out of business. The capitalist would enlarge his holdings, would organize his farming business just as business is organized in large manufacturing concerns, and the small farmer would be forced to quit. More than that, there would be a deterioration in society that would make the country anything else than a good place to rear a family. There would be slums all over the country, as there are in the cities.

We hear a great deal about intensive farming, by which is meant putting a large amount of labor on a few acres. That means the development of a peasantry, whose life is one of the narrowest, and the social conditions of which are anything but desirable. We believe in intensive farming in this sense: that the farmer should put sufficient labor on his land to grow crops at the lowest cost. We do not believe in an expenditure of labor on land to produce the highest possible yield without regard to cost.

As Professor Carver recently said in an address at Manhattan, Kansas:

"Wherever employes are scarce and hard to find, social conditions are good. Where employes are abundant, social conditions are bad." This is absolutely true in the cities; and if labor were as easily available in the country as in the city it would be quite as true there. Therefore, the high price of labor is not an unmixed evil, but has a great deal of good in it.

The solution of the problem is plain and easy, and is being solved by advanced farmers today. It is simply this: Arrange to employ your labor the year around and reduce the amount of extra labor during harvest to the minimum. This is entirely practicable, but involves the reconstruction of our system of farming, a reconstruction which we will be forced by circumstances to do.
Hints From a Practical Farmer

I. D. O'Donnell, Supervisor of Irrigation

If each farmer would keep a record of the farm work for a year he would likely find that the number of days actually spent in the work which returns the main farm income is small. During the months from March to November the principal farm work is accomplished and the bulk of the work is usually crowded into about three of these months. Of these three months not every day is a working day, due to bad weather. The result is that the farmer is confronted with the task of squeezing through a maximum of work in short periods, when everything must be as planned or loss occurs. It is in these periods of stress or what our efficiency experts call the "peak load" that a well-planned farmstead and farm are appreciated. Then it is we determine whether every building on the farm is constructed for efficiency; whether each building is located in the right direction or at the right distance from every other building; whether the feed lots, the garden, the poultry yard, and other such sub-divisions are properly located and the stock handled to the best advantage. The arrangement of the farmstead is just as important to the farmer as is the arrangement of the factory to the manufacturer. Manufacturers are planning with the view of reducing labor and costs. They are learning to start raw material in one end of a building and bring a finished product out the other end with never a backward movement or a moment's delay in the procedure.

Now that the thousands of men will be taken from farms to do the nation's work in war, time and labor will be the big items on the farm for some years to come. If you are planning new buildings, plan them for efficiency and locate them for efficiency. Plan them just as if every day in the year would be a busy day when every minute of time and every step is valuable.

Planning for efficiency does not mean an unattractive farm lay-out—rather, an attractive one.

Plan well; for planning takes but a short while and you will use your farmstead constantly for many years.
Half a Crop

Daniel L. Cady

When I was young I used to hear
The same sad story every year;
The farmers punctually agreed
They wouldn’t raise enough for seed;
They might just as well set still
They said and save their phosphate bill—
They might as well “shut up the shop.”
There wouldn’t be but half a crop.

The moon was either wet or dry,
And swung too low or hung too high;
The Dipper dipped too much one way,
Though which way ’twas they didn’t say;
The spring was late or extra late,
And piles of pullets didn’t mate.
And if it rained or tried to stop,
In either case ’twas Good Night Crop.

The seeded piece, it didn’t ketch
Except to poor man’s weed and vetch
The oats were thin, the crows were thick,
The garden-sass was looking sick,
The apples wasn’t doing well,
There’d be no Astrakans to sell;
And even popcorn wouldn’t pop,
That is, not more than half the crop.

And yet as long as I was ’round,
I never saw no cropless ground;
I never saw a crop derailed—
’Twas croppers, not the crops, that failed;
The things so slow to grow in spring
In summer grew like everything;
They hiked so fast they couldn’t stop,
And every year rolled up its crop.
THROUGH
THE
LEAVES

SEPTEMBER, 1917
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Twenty Dollar Pork in the Making
NOTES

N. R. McCreery

It scarcely seems possible that it is time to begin to talk about harvest, but in all probability before another issue of this booklet, we will have begun. It seems probable at this time that we will want to begin digging about September 24th.

+++

The early planted beets have almost all made a splendid growth, while the late planted fields have only within the last three weeks begun to make a showing. It would seem to be advisable on the part of the growers to defer the harvesting of these late patches as long as possible in order to give them an opportunity for growth. As for the Sugar Company, there should be sufficient number of early planted patches to give us beets to start the factory.

As per your contract, there will be no restrictions of delivery after October 8th. If cars are not available, we will pile on the ground.

+++

There is one clause of your contract that the growers have not taken advantage of as they should; that is, the right to employ check weighers and taremen. We would like very much to have this done. We know that the percentage of tare is as near right as we know how to make it, but you don't know it, or at least, some will not admit it. If you had your own man there for awhile, you might be better satisfied. We would appreciate such a check.

+++ 

In these days of sudden changes, it is very difficult for any of us to know our own minds, because what we decide today may be decided for us tomorrow in a manner entirely contrary to our own conclusions. It would therefore seem rather inadvisable, if we have mapped out a system of crop rotation for our farms, that this should be entirely broken up by reason of possible high prices of one
commodity. There is always the question in times like these of how much you are justified in robbing the future for the benefit of the present. For the one year tenant the question is probably easily answered. For the landlord and the owner farmer, it may be a different line of action. It is easy to forget that were it not for the sugar beet, the present record yields of grain would not be possible.

We have just finished cutting 269 acres of beet seed. From preliminary tests, the seed gives promise of being of a very excellent quality and the yield fully as good as anticipated. Reports from seed producing districts in Europe advise that the condition there is worse than before, and our only hope is from home grown seed.

We are entirely at a loss to predict the amount of pulp we will be able to allot. Applications are coming in quite freely, and there will doubtless be a large number of cattle fed. The high price of feed is discouraging to some and it may be that there will not be as many feeders this year as last.

If you are going to feed any molasses this year, we would request that you figure over your requirements as carefully as possible. A little later we will ask you to advise us definitely how much you will want reserved.

PRIZES FOR SUGAR BEETS AT THE BOULDER COUNTY FAIR

Last year a great deal of interest was shown in the special Sugar Beet Exhibit at the Boulder County Fair, a large number of growers competing for the Silver Cup offered by the Company for the five best sugar beets.

The Company is again offering a Silver Cup for the best five beets, and hope the growers will see to it that whoever wins it will have some competition.

The beets will be judged for shape, weight and sugar content—20 points for shape and 40 points each for weight and sugar content.
Stock Feeding Statistics for Last Season

H. Mendelson

<table>
<thead>
<tr>
<th></th>
<th>Cattle</th>
<th>Sheep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eaton</td>
<td>7860</td>
<td>63280</td>
</tr>
<tr>
<td>Greeley</td>
<td>5624</td>
<td>29970</td>
</tr>
<tr>
<td>Windsor</td>
<td>5458</td>
<td>22770</td>
</tr>
<tr>
<td>Fort Collins</td>
<td>10354</td>
<td>50650</td>
</tr>
<tr>
<td>Loveland</td>
<td>7188</td>
<td>7300</td>
</tr>
<tr>
<td>Longmont</td>
<td>13382</td>
<td>7100</td>
</tr>
<tr>
<td>Sterling</td>
<td>3604</td>
<td>2000</td>
</tr>
<tr>
<td>Brush</td>
<td>2543</td>
<td>7120</td>
</tr>
<tr>
<td>Fort Morgan</td>
<td>3625</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60628</strong></td>
<td><strong>190190</strong></td>
</tr>
</tbody>
</table>

Total tons pulp fed in these districts .......... 413338
Total tons molasses fed in these districts .... 11245

If we figure that ten sheep or lambs eat as much as one steer we fed the equivalent of 60628+19019=79647 steers averaging a little more than 5 tons pulp per head and 280 pounds molasses per head.

This number of animals represents about 2500 car loads of cattle and 780 car loads of sheep.

While the bulk of the pulp was hauled less than two miles, quite a number of feeders can afford to haul it much further.

61500 tons pulp were hauled between 2-3 miles.
16000 tons pulp were hauled between 3-4 miles.
15600 tons pulp were hauled between 4-5 miles.
11600 tons pulp were hauled between 5-6 miles.
4200 tons pulp were hauled between 6-7 miles.
6100 tons pulp were hauled between 7-8 miles.
880 tons pulp were hauled between 8-9 miles.
Range of Prices, 1915-16 Stock Feeding Season

Denver market prices when stockers and feeders were bought:

<table>
<thead>
<tr>
<th></th>
<th>1915</th>
<th>Tops</th>
<th>Bulk</th>
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<tbody>
<tr>
<td>Sept. 15-30</td>
<td>$7.19</td>
<td>$6.30-$7.00</td>
<td></td>
</tr>
<tr>
<td>Oct. 1-15</td>
<td>7.28</td>
<td>6.25-7.00</td>
<td></td>
</tr>
<tr>
<td>Oct. 16-31</td>
<td>7.21</td>
<td>6.30-7.00</td>
<td></td>
</tr>
<tr>
<td>Nov. 1-15</td>
<td>7.20</td>
<td>6.30-6.90</td>
<td></td>
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Denver market prices when the resulting beef cattle were sold:

<table>
<thead>
<tr>
<th></th>
<th>1916</th>
<th>Tops</th>
<th>Bulk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 15-31</td>
<td>$7.80</td>
<td>$7.00-$7.50</td>
<td></td>
</tr>
<tr>
<td>Feb. 1-15</td>
<td>7.50</td>
<td>6.98-7.43</td>
<td></td>
</tr>
<tr>
<td>Feb. 16-29</td>
<td>7.50</td>
<td>6.95-7.40</td>
<td></td>
</tr>
<tr>
<td>Mar. 1-15</td>
<td>8.25</td>
<td>7.20-7.90</td>
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Denver market prices when stockers and feeders were bought:

Range of Prices, 1916-17 Stock Feeding Season

<table>
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<th></th>
<th>1916</th>
<th>Tops</th>
<th>Bulk</th>
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</thead>
<tbody>
<tr>
<td>Sept. 15-30</td>
<td>$7.22</td>
<td>$5.50-$6.75</td>
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<tr>
<td>Oct. 1-15</td>
<td>7.48</td>
<td>5.90-7.10</td>
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</tr>
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<td>Oct. 16-30</td>
<td>7.53</td>
<td>5.90-7.15</td>
<td></td>
</tr>
<tr>
<td>Nov. 1-15</td>
<td>7.60</td>
<td>6.70-7.25</td>
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Denver market prices when the resulting beef cattle were sold:

<table>
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<tr>
<th></th>
<th>1917</th>
<th>Tops</th>
<th>Bulk</th>
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</thead>
<tbody>
<tr>
<td>Jan. 15-31</td>
<td>$10.40</td>
<td>$8.80-$9.80</td>
<td></td>
</tr>
<tr>
<td>Feb. 1-15</td>
<td>10.50</td>
<td>8.50-9.45</td>
<td></td>
</tr>
<tr>
<td>Feb. 16-29</td>
<td>10.47</td>
<td>8.90-10.20</td>
<td></td>
</tr>
<tr>
<td>Mar. 1-15</td>
<td>10.75</td>
<td>9.50-10.50</td>
<td></td>
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</table>
Wheat Prices Paid Farmers on Car Lots in Bulk, f. o. b. Denver

From "Field and Farm"

<table>
<thead>
<tr>
<th></th>
<th>No. 2 Hard Winter wheat per cwt.</th>
<th>No. 2 Soft Spring wheat per cwt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1917</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>$4.47</td>
<td>$4.47</td>
</tr>
<tr>
<td>12</td>
<td>4.50</td>
<td>4.50</td>
</tr>
<tr>
<td>19*</td>
<td>*3.00</td>
<td>*3.00</td>
</tr>
<tr>
<td>26</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>June</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>9</td>
<td>4.00</td>
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<tr>
<td>16</td>
<td>4.00</td>
<td>3.75</td>
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<tr>
<td>23</td>
<td>3.25</td>
<td>3.25</td>
</tr>
<tr>
<td>30</td>
<td>3.25</td>
<td>3.25</td>
</tr>
<tr>
<td>July</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>3.25</td>
<td>3.25</td>
</tr>
<tr>
<td>14</td>
<td>3.00</td>
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</tr>
<tr>
<td>21</td>
<td>3.00</td>
<td>3.00</td>
</tr>
<tr>
<td>28</td>
<td>3.50</td>
<td>3.50</td>
</tr>
<tr>
<td>Aug.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4.07</td>
<td>4.07</td>
</tr>
<tr>
<td>11</td>
<td>4.47</td>
<td>4.47</td>
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<tr>
<td>18</td>
<td>3.17</td>
<td>3.17</td>
</tr>
<tr>
<td>25</td>
<td>?</td>
<td>?</td>
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* Following Chicago Pit Fight.
Beet Tops

H. Mendelson

The beet tops are a very considerable part of the total product of an acre of beets. An acre of beets yielding about thirteen tons of beets will produce about nine tons of green tops if there is no leaf spot or hail. These nine tons of tops contain about 15%, or 1.35 tons (equals 2700 pounds) dry matter and 7.65 tons water.

The dry substance of the tops consist of about

- 10.5% digestible protein
- 1.2% digestible fat
- 36.0% digestible carbohydrates
- 7.0% digestible fiber

Ordinary alfalfa hay analyzed by the same methods contains, according to Henry's Feed and Feeding:

- 10.6% digestible protein
- 0.9% digestible fat
- 27.0% digestible carbohydrates
- 12.0% digestible fiber

So far as these conventional analyses are concerned there is not much difference between the two except that the alfalfa contains more fiber. However, the beet tops contain a great deal more potash, which scour the animal, if it has unlimited access to the green or dry tops. Also, according to the weather during the beet harvest, the tops contain varying amounts of dirt, which are not of benefit to the animal. Therefore, the feeding value of beet tops fluctuates more than that of other feeds which are obtained in clean form.

The final value of a food consists not of what is in it but what you get out of it. If the tops are transformed into mutton or beef they are certainly more valuable if the resulting animal sells for 10c per pound than when it sold
for 7c per pound. This means that beet tops today in common with all other farm produce have a much higher value than two or five years ago. This is frequently forgotten when calculating the returns from an acre of beets. Anyway, beet tops are worth more today than they ever were. While better use is made of them every year, there are still some farmers who do not make as good use of them as possible. There are several articles in this issue by practical men showing what can, and has been, done.

**Yield of Tops Per Acre.**

Unfortunately, there are very few accurate figures available referring to the actual yield of tops under different conditions. A common saying among farmers is that an acre of beet tops furnishes feed for one steer for 100 days.

If the average yield of 2700 pounds dry matter per acre, mentioned above, is obtained, it would allow one steer 27 pounds dry matter, which is a little more than usually consumed by a 1000-pound steer. A common feed per head per day is 100 pounds of pulp and 15 pounds of hay, equals 23.5 pounds dry matter.

Our Agricultural Superintendent, Mr. Heldt, at Scottsbluff, fed, last year, 210 steers with beet tops, hay, molasses and cake. The tops were weighed. He obtained two tons of dry tops from a field averaging 12 tons of beets. The steers ate on an average 18.5 pounds of dry tops per head per day. Mr. Heldt stated that the steers liked to eat more tops, but if allowed to they did not gain as much as when limited to a certain amount.

However, leaving aside the wisdom of allowing the animal to eat such quantities of beet tops, 100 days feed for one steer seems a fair expression of an average yield.

With dairy herds, which on the whole are fed more rationally than other animals, an acre of beet tops often lasts considerably longer than 100 days, mainly because dairy men have found out that feeding an excessive amount of beet tops does not maintain the maximum production of milk. The reason for this may be that tops are too bulky in proportion to their real food value, so that the cow,
while keeping her stomach filled, does not get enough nourishment for maximum production.

A considerable number of steer feeders also express the opinion that beet tops must be fed in limited quantities and supplemented by other feeds in order to get the best results.

**Fluctuations of the Yield of Beet Tops.**

There is an impression that some fields run more to tops than others. This is true to a certain extent. While big crops of beets cannot be produced without big tops, it is also true that the higher the fertility of the land the higher is the yield of tops in proportion to the beets harvested.

The *seven year average* on a German experimental farm shows the following interesting figures:

<table>
<thead>
<tr>
<th>Fertilizer Used</th>
<th>Tons per acre</th>
<th>Lbs. tops per 100 lbs. beets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stable manure, nitrate, phosphate and potash</td>
<td>19.2</td>
<td>16.3</td>
</tr>
<tr>
<td>Stable manure alone</td>
<td>17.5</td>
<td>10.8</td>
</tr>
<tr>
<td>No manure</td>
<td>14.1</td>
<td>7.0</td>
</tr>
</tbody>
</table>

While the use of stable manure and commercial fertilizers increased the yield of beets five tons per acre over the unmanured fields, it increased the yield of green tops by nine tons.

The yield of tops in proportion to that of beets also varies from year to year, frequently depending on the state of maturity. The beet tops usually increase in size up to about 100 days after thinning. Thereafter they remain stationary for a while and actually decrease in weight if the beets really mature. The beets, of course, increase in weight all the time if fertility and moisture content of the soil permits it. So it happens frequently that the average weight of the green top of one beet is by August 15th 1 ½ pounds, while the beet weighs about three-fourths of a pound. The tops at that time frequently weigh twice as much as the beet.

By the middle of September the beets in the same field weigh 1 ½ pounds each and the tops the same.
By the middle of October the beets will average 2 pounds each, while each top will weigh probably a little less than \( \frac{1}{4} \) pounds.

Beet fields in one district in the second half of August look very much more alike than at any other date, because almost all of them, regardless of the date of planting, have reached the maximum growth of the tops, unless leaf spot or lack of water have created abnormal conditions.

Beets cannot be considered matured unless they have at least 16% sugar. In unfavorable years, like last year, many fields do not test that high.

How much the yield of green tops per 100 lbs. beets can vary in different years can be seen from the records of the Experimental Station mentioned above. Since the beets are not irrigated, the fluctuation of the rainfall naturally influences these yields very much:

**Fields Receiving Stable Manure and Nitrate.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Beets</th>
<th>Tops</th>
<th>Green tops Per 100</th>
<th>Top dry substance Per 100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tons per acre</td>
<td>Green tops Per 100 Lbs. beets</td>
<td>Top dry substance Pounds Per 100 Lbs. beets</td>
<td></td>
</tr>
<tr>
<td>1906</td>
<td>25.3</td>
<td>24.0</td>
<td>94.8</td>
<td>5890</td>
</tr>
<tr>
<td>1908</td>
<td>20.4</td>
<td>18.7</td>
<td>92.0</td>
<td>5630</td>
</tr>
<tr>
<td>1907</td>
<td>20.3</td>
<td>17.2</td>
<td>85.0</td>
<td>5020</td>
</tr>
<tr>
<td>1909</td>
<td>18.0</td>
<td>15.3</td>
<td>85.1</td>
<td>4350</td>
</tr>
<tr>
<td>1903</td>
<td>16.1</td>
<td>9.8</td>
<td>60.5</td>
<td>3490</td>
</tr>
<tr>
<td>1904</td>
<td>11.7</td>
<td>7.8</td>
<td>66.9</td>
<td>3190</td>
</tr>
</tbody>
</table>

During these years the yield of green tops per 100 lbs. beets varied between 95 and 69 lbs. The years with high yields gave a high percentage of green tops, while the years with lower yields of beets gave a rather low percentage. However, green beet tops contain in different years varying percentages of moisture. Usually a rank growth of tops has a high percentage, while a small growth of tops has a low percentage of moisture.

In the records quoted above, the rank growth in the
year 1906, furnishing 95 lbs. green tops per 100 lbs. beets, the tops contained 87.8% water, while in 1903 with 60% green tops they contained only 79.7% water. Therefore, the yield of top dry substance per 100 lbs. beets harvested does not differ as much as that of green tops. In 1906, 11.6 pounds of dry tops were harvested per 100 lbs. beets; in 1903 it was 10.8 pounds.

In the Scottsbluff feeding operations, mentioned above, a yield of 16.5 pounds of dry tops per 100 pounds beets harvested were actually hauled off the field. Of course these tops contained a considerable amount of moisture.

That the state of fertility of a field influences the relative yield of tops can be seen from the following figures obtained in a German experimental station:

### Yield of Green Tops per 100 Pounds Beets Harvested.

<table>
<thead>
<tr>
<th>Year</th>
<th>Manure &amp; Nitrate</th>
<th>Manure Alone</th>
<th>No Manure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1906</td>
<td>94.8</td>
<td>73.6</td>
<td>58.0</td>
</tr>
<tr>
<td>1908</td>
<td>92.0</td>
<td>61.5</td>
<td>78.3</td>
</tr>
<tr>
<td>1907</td>
<td>85.0</td>
<td>63.0</td>
<td>58.0</td>
</tr>
<tr>
<td>1909</td>
<td>85.1</td>
<td>68.0</td>
<td>49.6</td>
</tr>
<tr>
<td>1903</td>
<td>60.5</td>
<td>48.9</td>
<td>49.2</td>
</tr>
<tr>
<td>1904</td>
<td>66.9</td>
<td>57.6</td>
<td>47.7</td>
</tr>
</tbody>
</table>

The relative yield of beet tops was increased every year by the addition of nitrate. Two years out of six the fields receiving no manure or nitrate produced the lowest relative yield of tops. However, an increase in the relative yield of the tops, as well as in the absolute yield, was in most cases accompanied by an increase in the yield of beets, as can be seen from the following table:

### Tons Beets and Green Tops Per Acre.

<table>
<thead>
<tr>
<th>Year</th>
<th>Manure &amp; Nitrate</th>
<th>Manure Alone</th>
<th>No Manure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beets</td>
<td>Tops</td>
<td>Beets</td>
</tr>
<tr>
<td>1906</td>
<td>25.3</td>
<td>24.0</td>
<td>24.1</td>
</tr>
<tr>
<td>1908</td>
<td>20.4</td>
<td>18.7</td>
<td>18.9</td>
</tr>
<tr>
<td>1907</td>
<td>20.3</td>
<td>17.2</td>
<td>49.2</td>
</tr>
<tr>
<td>1909</td>
<td>18.0</td>
<td>15.3</td>
<td>15.4</td>
</tr>
<tr>
<td>1903</td>
<td>16.1</td>
<td>9.8</td>
<td>14.1</td>
</tr>
<tr>
<td>1904</td>
<td>11.7</td>
<td>7.8</td>
<td>11.3</td>
</tr>
</tbody>
</table>
Therefore it can be stated, big crops of beets cannot be
grown without big tops, but the beets do not grow bigger
in the same proportion as the tops grow.

To what extent the minerals absorbed by the beet are
accumulated in the tops can be seen from the following
figures:

The seven-year average of the fields receiving manure,
nitrate, phosphate and potash, was---

19.2 tons beets
16.3 tons green tops

This material contained:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In the tops</td>
<td>109</td>
<td>31</td>
</tr>
<tr>
<td>In the beets</td>
<td>72</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td>181</td>
<td>57</td>
</tr>
</tbody>
</table>

The tops contained more of the mineral plant food than
the beets did.

To Sum up:

The composition of the dry substance of beet tops some-
what resembles that of alfalfa hay, although it may not
have the same food value.

The yield of green tops of a normal field may be assumed
to average about 75% of the weight of beets. This will be
higher with immature beets and beets in vigorous growing
condition and lower with fields of low fertility.

The yield of tops as dry as they can be prepared in the
field and which you can haul off a field will be 10 to 15% of
the weight of beets harvested.

If alfalfa hay is worth $15.00 the ton, the dry beet tops
of a normal acre of beets, certainly yielding more than a
ton, are worth at least as much.

The value of beet tops should be calculated in the re-
turns from an acre of beets.
Sheep Feeding in Northern Colorado

H. H. Griffin

The pioneer lamb feeders of northern Colorado were Bennett Bros. of Fort Collins. In the fall of 1889 they brought 2500 grade Mexican lambs to northern Colorado to fatten for market. They bought alfalfa hay that year for $3.00 in the stack and corn cost them about 60c per hundred. These lambs cost $2.00 per cwt. In March, 1890, the first of these lambs were shipped to Chicago and brought $5.05 per hundred—the final shipment brought $6.40 per hundred. The next year 3500 sheep were fed in Larimer county, in 1891, 6000; in 1892, 30,000. It increased each year about 20,000 until the winter of 1897 showed 193,000 fed in this county.

At the present time a comparatively small territory within a radius of ten miles of Fort Collins can justly lay claim to the banner section of the world for marketing fat sheep and lambs. In the neighborhood of 325,000 were purchased by the farmers of this section in 1916 and fattened for market. This is about the usual number that are now marketed every year.

The territory mentioned furnishes all of the hay besides a considerable quantity of barley. In addition, many carloads of corn are shipped from eastern points. Pulp is now being used for feed for sheep of all kinds in considerable quantities—about 50,000 head being fed on sugar factory by-products last year.

Usually there are many sources from which to purchase lambs for feeding purposes. Many of the larger feeders in northern Colorado carry on a commission business in connection with their feeding operations and purchase lambs for the smaller feeders. There are also commission dealers who will purchase the sheep and sell to the farm-
ers, or in some instances put them in feed lots on a percentage basis. Of late years many of the smaller feeders go directly to the growers on the range and purchase their feeders direct, others get them in the yards in Denver and elsewhere. Quite a number, of recent years, have bought partly finished stuff from the San Luis Valley pea fields that come on the market in December and January. Which of these methods to employ must be decided by each individual according to the circumstances. A man buying a small lot, of course, cannot afford the expense of going out and looking them up. Unless one is an excellent judge, it is best to buy on the basis of so much per hundred pounds rather than so much per head. In the former case one may know just what he is getting for his money and consequently can make a better estimate of his shrink and what are the final returns.

Nearly all of the sheep fed are lambs from the western ranges that weigh from 40 to 60 pounds, when put in the feed lots along in October. A few purchase old ewes, but I think that they are going out of favor all the time. They should be bought only when one is close enough to a sugar factory that pulp can be easily secured. It is necessary to put them on some kind of succulent feed for, in most instances, their teeth are in such poor condition that they cannot utilize corn and often times, if turned on beet tops, the loss by choking is considerable, from the fact that they cannot chew the crown and consequently attempt to swallow it whole. The profits on this class of stock come mostly from the increase in price between buying and selling periods and not from the increase in weight. As a general thing but little additional weight is put on ewe stuff.

Suppose a farmer has an eighty-acre farm, twenty acres
of which is in beets, on thirty additional acres of the farm he should produce one hundred tons of hay. For the purpose of this article we will not consider the crops that may be grown on the remainder of the farm. It requires about one ton of hay to feed 10 head of lambs through the fattening period, which on the average is 120 days, the 100 tons produced should feed about 1000 lambs. The beet tops from 20 acres of the average beets, according to the best estimates I can secure, should feed about 1000 lambs from 15 to 20 days. This will shorten up the period from 15 to 20 days on which the lambs must be fed on hay and corn.

Let us see what may be the probable value per acre of beet tops bought at the present price of corn and hay. We will suppose the tops feed the lambs 15 days—15 days at 0.8 tons per day, the amount hay required, equals 12 tons. If these tops substituted for an average of a half pound of corn per head per day, which is a low estimate, they would save in the 15 days 500 lbs. of corn, which at two cents per lb. would be $150.00 in 15 days. The account will then stand as follows:

- Corn, at 2c .................................. $150.00
- Hay at $10.00 per ton ......................... $120.00

Total ........................................ $270.00

Giving a return of $13.50 per acre for the tops without any expense attached, as the harvesting of the tops has been charged to the beet harvest and the lambs have fed themselves.

Most of our feeders prefer to feed the tops by turning the sheep upon them in the field; in fact, some say that it is the only way that they should be fed. If the weather is very dry, so that the tops are not trampled into the dirt, perhaps it is the most economical way. A sufficient time can usually be secured when the weather conditions will permit for feeding this way. It is preferable to feed the tops by turning on the fields at a time when the crowns are still comparatively tender and hence readily eaten. If preserved in piles the crowns become hard and difficult for the sheep to chew and if hauled to the yards in this condition the sheep will pull them through the racks and
trample them under foot, which entails as heavy a loss of feed as when the tops are fed in the fields, provided proper choice is made of weather conditions. Hauling them to the racks also entails considerable cost in labor.

While hauling to racks may be the proper one for feeding cattle, yet this method is not necessarily the best for feeding sheep for the reasons above expressed. The old method of feeding alfalfa was by means of panels through which the lambs thrust their heads. The hay was thrown up to them twice each day. Of late years many feeders employ what is called “self feeders.” These are a sort of rack placed in the center of the corral, from which the sheep feed on both sides. They are made in a trough like form, about 5 feet long and four feet wide at the top, with an opening at the bottom through which the hay comes to the sheep, being forced through by its own weight and only in such quantities as the sheep can consume.
There is some difference of opinion as to the merits of the two methods, but I think the larger number of feeders prefer the "self feeders." In addition to the hay it requires about 150 lbs. of corn, unless beet tops are supplied, to finish a lamb. This corn is fed in very small amounts at the beginning, gradually increasing it as the lambs become accustomed to the feed, until the last six weeks a pound and a quarter to a pound and a half per head per day is reached. If pulp is used it requires about 10 lbs. for a lamb and 20 lbs. for ewes per day.

But little feeding has been done on molasses and but little data can be secured, in fact, nothing that I consider very reliable. However, it should be fed by being strewn on the pulp or on cut hay or straw. So far no injurious results have followed and no doubt when its value becomes known it will be more largely employed.

From the amount of feeds as given above, a gain of 30 lbs. per head should be secured. In order to get a considerable profit on lamb feeding, a three-cent margin should be secured between the price of the lean lambs and the fat ones. Whether or not this margin will be secured no one can tell. Even experienced feeders consider it something of a gamble, but experience has shown with those who have been in the game for 12 or 15 years and fed every year, thus taking the good years and poor ones, that the business on the whole has been profitable. That fair returns have been secured for such crops as were produced and fed and in addition the fertility of the farm has been increased each year.

Let us consider the value of the feeding operations from the standpoint of fertility. The amount of land that can be fertilized with a thousand sheep will depend on how liberally bedding is used, varying from 10 to 15 acres per year. Thus it will be seen that the fertility on 20 acres of the 80 acres here considered, which may be devoted to beet raising, can be very well maintained, especially when the proper rotation of crops is carried out. One gratifying feature is that where sheep feeding is done it works in very nicely with the growing of beets. The application of
this fertilizer produces heavy crops of beets, and in turn, it is a crop by which the sheep manure may be turned to account in producing bumper crops other than beets.

Prior to the inception of beet growing in this section nearly every farm upon which sheep were fed had vast piles of manure lying unused. The farmer did not dare to put it on the grain fields because it made them too rich and the grain would fail. Nor could it be put on the alfalfa, for when it was broken and seeded to grain the same results would follow. By applying this fertility to two or three crops of beets the land is put in such condition that bumper crops of all kinds of grain are grown with but slight expense for preparation, which is also true for alfalfa which may follow the grain.

To exemplify this I will cite the following, tabulated from the records of this office and covering a period of the last five years. We tabulated from 32 farms on which feeding had been done and the manure applied every year. The lowest average yield on any of these farms for the 5 years was 12.64 tons per acre, the highest average yield for the 5 years was 18.09 tons per acre. The average for the 32 farms was 15.3 tons per acre.

We also tabulated results from 26 farms on which little or no feeding had been done for the same 5 years, but which had grown beets each year. These farms are some of the best in the district, just as good as any of the 32 above mentioned, only the fertilizer had not been applied to any extent. Only small areas, such as would take care of the ordinary accumulations being used. An effort was made to get only good average farms so that the comparison would be just. By taking the real poor farms the comparison would be much more striking. The lowest 5-year average yield on any of the 26 farms was 9.18 tons and the highest 5-year yield was 15.8. The average for the 26 farms for the 5 years was 12.3 per acre, making a difference between the average of the 32 farms and the 26 farms of just 3 tons per acre.

This additional yield will more than repay for the expense attached, but when one knows the details in regard
to the profits on these farms by way of increased grain crops on the fertilized as compared with the unfertilized and the much larger amount of feed secured in tops, etc., the results are much more convincing as to how feeding and beet growing go hand in hand to the benefit of all crops grown and add to the money returns from the fertilized farms.

Meteorological Report

JULY 1917

<table>
<thead>
<tr>
<th>Temperatures:</th>
<th>1917</th>
<th>1916</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Maximum</td>
<td>88.2°</td>
<td>84.7°</td>
</tr>
<tr>
<td>Mean Minimum</td>
<td>52.2°</td>
<td>53.0°</td>
</tr>
<tr>
<td>Monthly Mean</td>
<td>70.2°</td>
<td>68.8°</td>
</tr>
<tr>
<td>Departure from Normal</td>
<td>+0.3°</td>
<td>—1.1°</td>
</tr>
<tr>
<td>Maximum</td>
<td>98° on 24th</td>
<td>98° on 16th</td>
</tr>
<tr>
<td>Minimum</td>
<td>46° on 1st</td>
<td>48° on 3rd</td>
</tr>
</tbody>
</table>

Precipitation:

<table>
<thead>
<tr>
<th>Precipitation:</th>
<th>To Date</th>
<th>1.50</th>
<th>Greatest in 24 hours</th>
<th>1.32 on 26th</th>
<th>Departure from Normal</th>
<th>—0.31</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Date</td>
<td>9.72</td>
<td>6.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For Month</td>
<td>1.50</td>
<td>1.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest in 24 hours</td>
<td>1.32 on 26th</td>
<td>0.32 on 29th</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Departure from Normal</td>
<td>—0.31</td>
<td>—0.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of Days:

<table>
<thead>
<tr>
<th>Number of Days:</th>
<th>Clear</th>
<th>Partly Cloudy</th>
<th>Cloudy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear</td>
<td>4</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Partly Cloudy</td>
<td>27</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Cloudy</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Cheer up! You have two chances—one of being drafted and one of not; and if you are drafted you have two chances—one of going to France and one of not going; and if you go to France, you have two chances—one of getting shot and one of not; and if you get shot, you have two chances—one of dying and one of not; and if you die—well, you still have two chances.—Wet Mountain Tribune.
OMEWHERE in a Colorado town lives a landlord owning a beet farm in the county. He has had the same tenant for four years. Every year beets and some potatoes were raised and steers fed.

The tenant has money enough to buy a farm, but the landlord is very anxious to induce him to stay on the farm. The landlord does not believe in renting his farm for less rent than the neighbors get. So the only financial inducement he could offer was some kind of a partnership in feeding steers, whereby the renter got a good share of the profits.

They agreed on the following plan:

The landlord was to buy and sell the steers as he thought best, the tenant furnishing as much money as he cared to and the landlord the rest, each to be credited with interest at the rate of 6%.

The tenant's alfalfa was to be credited with $10.00 per ton, the landlord's with $9.00 per ton.

Corn to be bought at the end of September, the landlord receiving interest at the rate of 6% and the tenant paying for half the corn after the cattle were sold.

The cost of all other feed bought to be shared alike. The beet help was to get 50c an acre extra for piling the tops, the tops to be hauled to the feeding pen as fast as eaten.

The tenant to receive $1.00 per day for feeding the steers. The remainder of the receipts were to be shared alike by landlord and tenant, except hides of dead animals which belong to the landlord.

In case the receipts were not sufficient to cover all the items mentioned, they were to be distributed in the following order:
1. Food purchased for cash and 50c per acre of beets.
2. Tenant's alfalfa.
3. Landlord's alfalfa.
4. Tenant's interest on purchase money.
5. Landlord's interest on purchase money.
6. Tenant's wages at $1.00 per day.
7. Rest to be divided in proportion to money put up for the purchase of the steers.

The results of the feeding operations were as follows:

Sold 51 steers @ 1225 lbs. @ $10.70 net, $131.08 net per head, $6684.83.

Bought 52 steers @ 970 lbs. @ $8.10 net, $78.57 net per head, $4085.64.

The amount given for steers sold is the total received minus freight and commission. The amount given for steers bought is the price of steers plus freight and commission. The weight of the steers is the weight at the time and place of selling or buying.

**Distribution of Disbursements**

<table>
<thead>
<tr>
<th>Item</th>
<th>Total $</th>
<th>Landlord</th>
<th>Tenant</th>
</tr>
</thead>
<tbody>
<tr>
<td>25000 lbs. corn @ $1.85 per 100</td>
<td>$462.00</td>
<td>$231.00</td>
<td>$231.00</td>
</tr>
<tr>
<td>10 tons molasses @ $10.00</td>
<td></td>
<td>100.00</td>
<td>50.00</td>
</tr>
<tr>
<td>6 tons cottonseed cake @ $48.00</td>
<td>288.00</td>
<td>144.00</td>
<td>144.00</td>
</tr>
<tr>
<td>Tenant's alf., 12 tons @ $10.00</td>
<td>120.00</td>
<td>120.00</td>
<td></td>
</tr>
<tr>
<td>Landlord's alf., 27 tons @ $9.00</td>
<td>243.00</td>
<td>243.00</td>
<td></td>
</tr>
<tr>
<td>Alf. bought 19.5 tons @ $10.00</td>
<td>195.00</td>
<td>97.50</td>
<td>97.50</td>
</tr>
<tr>
<td>Beet top labor, 28 acres @ 50c</td>
<td>14.00</td>
<td>7.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Int. on corn bought (5 mo.)</td>
<td>9.47</td>
<td>9.47</td>
<td></td>
</tr>
<tr>
<td>Interest on purchase money</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenant $1000</td>
<td>25.00</td>
<td></td>
<td>25.00</td>
</tr>
<tr>
<td>Landlord $3085</td>
<td>77.13</td>
<td>77.13</td>
<td></td>
</tr>
<tr>
<td>Tenant's lbr, 150 days @ $1.00</td>
<td>150.00</td>
<td></td>
<td>150.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$1683.60</td>
<td>$859.10</td>
<td>$824.50</td>
</tr>
<tr>
<td>Cattle purchased and freight</td>
<td>4085.64</td>
<td>3085.64</td>
<td>1000.00</td>
</tr>
<tr>
<td>Profit divided</td>
<td>915.59</td>
<td>457.74</td>
<td>457.75</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$6810.03</td>
<td>$4465.14</td>
<td>$2344.89</td>
</tr>
</tbody>
</table>

324
These steers, during the 150 days feeding consumed, per head, about—

2250 lbs. alfalfa
400 lbs. molasses
230 lbs. cottonseed cake
490 lbs. corn
½ acre beet tops
½ acre oat straw.

In the calculation given above, all food eaten is charged against the feeding operation at fair market prices, also interest and labor. Therefore, the profit left on this basis may be credited to the beet tops and the oat straw.

These profits were $915. This would be about $33 per acre of the 28 acre beet tops.

If the steers had been sold at $1 less per hundred pounds, or about $12 less per head, the profits on this basis would still have been $310, or about $11 per acre of beet tops.

The beets from this 28-acre field averaged a little more than 17 tons per acre and therefore produced a yield of tops higher than the average field. Also the steers bought were of very good quality. They made a gain of about 1.7 lbs. per head per day and when sold about the middle of March, nearly topped the market.

The landlord says they could have sold the alfalfa at about $100 more than charged to the feeding operations and the corn at about $66 more. The beet tops also could have been sold at $156, giving them $322 more revenue. But in this case the tenant would not have received the $150 wages for feeding the steers.

In addition to the profit made out of the steers there were 10 shoats kept in the feeding pen which gained 750 lbs. in the 150 days. The value of this gain was estimated $10 per 100 lbs. or $75.

Also there was manure enough to give a fair dressing to 28 acres.

The landlord is satisfied because, besides getting the market prices quoted for the alfalfa, he got $86 interest
and $457 profit, or a total of $543 as interest on about $4000 cash put up for 5 months, or at the rate of 32% per year.

The tenant took the farm for another year and is loaning money to some less fortunate brother tenants.

The figures quoted above are taken from the landlord’s records. The landlord’s modesty has forbidden me to mention his name.

The Soil We Till

J. F. Jarrell

(Continued)

W

HEN we grow crops continuously on our soil without making suitable arrangements to replace the plant food which is used by the crops, we commit a very grave error, which equals a great many crimes for which men are imprisoned. For instance, if we overdraw our bank account, the law gets us. If we overdraw our plant food account in the soil, the poor house will get us and I maintain that it is a crime to let the poor house get us.

What we need to do is to intelligently apply ourselves and outline a plan to return to the soil every year if possible more plant food than is used up by that year’s crops. How can this be done? Simply by applying the proper proportions of mind, muscle and power. And by the way, remember that tractors do not make manure, produce young, or give milk. Cows and mares do.

A one-crop system cannot produce the best results. We need to rotate our crops, feed livestock and spread manure.

Experience and experiments bear out the assertion that “a well-balanced farming and feeding operation” is the most profitable of farming systems.
Of course all of us have our ideas about such things. We think that we are doing our very best under conditions as they exist on our individual farm. It may be that we are, but conditions in older settled sections indicate that we can well afford to look around and see that perhaps after all we can make some improvement by changing our ideas as all wise men do, and profit by so doing.

We should handle our soil not only for our own immediate gain, but so that we may have something of real value to leave our children when “I lay me down and die.” One of the worst things a young man can inherit is a worn-out farm; it discourages him at a time when he is so much in need of encouragement.

Teach the boy to love the old homestead by the example of loving it yourself. We seldom abuse the thing we love. Teach him to look upon the home not only as a place to come when he is hungry, but as a place of constant abode, a place where fond memories are born and where an honest living can be made and an honorable life spent. To do these things we must plan and build for permanence. The only foundation of which is sane farming methods and sane men to handle them.

In these times of national strain and trouble it is more apparent than ever that farming is the all-important business of our country. Let all of us get a lesson from the present conditions and plan for greater production than ever before and when the war is over we will know how to produce things at home which formerly were brought from abroad.

Do not abuse your land by making it produce some crop which happens to be high in price at this time, but go right along with your program of improvement and the chances are in favor of your success. A farmer is of necessity a gambler, but it does not follow that it is required of him to be a plunger. Till the soil intelligently and it will supply you abundantly, then you will love and be proud to own a portion of “The Soil We Till.”
The Lost Art

A. C. Maxson

The present generation knows little of the art of self-support as it was known and practiced by our forefathers of a generation ago. To be sure we are self-supporting; that is, we earn a certain wage and pay some one else for doing for us what we do not know how to do or do not like to do. We care too much for our own pleasures and recreation to do many of the things that add so much to the satisfaction of living.

We take pride in showing our friends our new Super Six or our Flivver. We swell up with importance when we speak of the prizes we won at the County Fair and we are justly proud of our livestock and farm improvements, but how many of us ever take our friends by the arm and lead them to the cellar to exhibit the store of vegetables and cured meats or to the smoke house to show them the hams and bacons hung on the pegs?

Some one may say: "But we can't take the time for all this work." No, but we can get into the Tin Lizzie and go to town and spend all Saturday afternoon and perhaps Monday or Wednesday afternoon also.

Some one else will say that these things are necessary. So they are, but we could get along without quite so much. Going is a habit which grows on one. The automobile makes going easy and if we are not careful we will spend too much time off of the farm and too much money for gas to go and come with.

We have no meat for tomorrow so we crank up the horseless carriage and go to town for a supply. The weather is hot and as we have no ice on the farm a small quantity must be purchased. It costs us not less than 6c a mile to run the Ford if we are honest in our figuring, so we spend say 30c to get $1.00 worth of meat. This is a part of the cost of "high living." The cost of rational living is high enough without any extras.

But this is not exactly what I started to write about. Last winter the writer spent a few days in a settlement
snugly enclosed in a narrow valley of one of our far eastern states. Here the people were living more as they did fifty years ago. Not unprogressive and back-woodsey, but self-supporting. They had their autos and telephones, kept their pure-bred cattle and poultry and had their social organizations, good schools and all that, but have not broken away from the practice of producing as much of what they eat themselves as possible.

The first morning I sat down to a breakfast of bacon and eggs with flap-jacks and real maple syrup. The bacon was sugar cured and made as follows: For every 100 lbs. of meat, mix 7 lbs. of salt and 2 lbs. sugar and 2 oz. salt petre. The meat is thoroughly rubbed with this mixture three days in succession, then allowed to stand for a week, then rubbed three more days in succession. The whole of the salt and sugar mixture should be used in this process. The sides of bacon are then ready for smoking. No liquid smoke, thank you, but the real old corncob smoke. Ham is put up in the same way.

The eggs were fresh and nice so I asked how many eggs they were getting a day. The reply that the hens had not been laying for a couple of months made it necessary to ask how the eggs were preserved.

Each egg was wrapped in a piece of old newspaper. After wrapping, the eggs were packed in one-gallon jars, each jar holding one dozen. These jars were numbered so that the oldest eggs should be eaten first. The secret of having eggs keep well in storage is to shut up Mr. Rooster. Infertile eggs keep much better than fertile ones.

The breakfast dishes were washed with home-made soap which was made of the scraps of fat meat and other waste (?) fats. A little prepared lye can be used instead of that leached from hard-wood ashes.

For dinner we had succotash, corned beef and pumpkin pie all home made. The succotash was made of dried sweet corn. The corn was cut from the ears without cooking, placed on plates and put into the oven where the temperature was just high enough to dry it rapidly without burning. The beans were picked just as the pods begin to wilt, and dried.
The corned beef was made by the host, but I failed to secure the receipt. The pumpkin pie tasted like fresh pumpkin but it was not, it was dried. The pumpkin was cut up, rind and all, after the seeds were removed, stewed until dry enough so that it could be made into paddies like fish balls or hamberger steak, then dried.

Yes, and there were pickles put up in 15¢ a gallon vinegar made of brown sugar. 1 1/2 lbs. brown sugar and one gallon of water to which a piece of mother of vinegar the size of the hand was added had produced a vinegar that puts our 50¢ vinegar to shame.

For supper there were more good things produced and preserved on the farm. Among them were tomatoes which had been kept in brine since fall and which made very good fresh tomato stew.

After supper the apples and cider were brought out. I am temperance through and through, but I drank this cider without a sting of my conscience or my tongue. It had been scalded and bottled and was perfectly sweet.

The good housewife of this home buys meat enough for several days even in hot weather. This is partially cooked and buried in lard where it keeps perfectly fresh and can be removed and warmed and served when needed. In this way and many others trips to town are prevented and the time utilized in the preparing of some of the good things I ate while there.

Right now I am in about the fix the old fellow and his wife found themselves when they decided not to have any supper, but to roast potatoes in the fire place. After eating several of these potatoes they were so hungry that the wife had to get a real supper. Thinking of all the good things we don't dry, can and preserve makes me so hungry I want to begin putting up things right away. Unfortunately I live in town, on a city lot with a garden about 4x4, but most of you are situated differently. Necessity is the mother of invention and sometimes the mother of changed habits. Possibly the war and its high prices is not as bad a thing as we picture it. Maybe it will bring us down to earth again and instill a little more of the principle of real genuine thrift into us. Let us hope.
Why Alfalfa Succeeds or Fails

W. E. Bowers
From "The Country Gentleman"

UGUST is the month in which most Iowa farmers make their seedings of alfalfa—it is the month that brings the greatest success, time has shown. So it is particularly interesting right now to learn some of the causes of success and failure with this crop, as reported to the Farm Crops Section of the Iowa Experiment Station by more than 1200 farmers.

Every farmer who thinks of starting with alfalfa wants to know what kind of soil the crop will do best on. The 1056 reports showed that alfalfa was most successful on loam soil with a clay or sand-gravel subsoil. An average of 3.6 tons to the acre was obtained from alfalfa seeded on this type of soil, as compared with 3.4 tons to the acre on clay soil with a sand-gravel subsoil, and 3.2 tons on sandy soil with a sand-gravel subsoil. The largest number of failures—forty per cent—resulted from seeding on sandy soils with a sand-gravel subsoil. However, only 15.5 per cent failures occurred on sandy soils with clay subsoil.

Besides the loam soils’ producing the largest yields, a seeding of alfalfa is more likely to prove successful on this type of soil; from the numerous reports only 10.1 per cent of failures occurred. On clay soils 34.5 per cent of the seedings failed. Every farmer, of course, does not have the variety of soil which he would choose to devote to alfalfa, but those farmers who have the different types should grow alfalfa on the loam type.

“What crop should I seed alfalfa after?” is a question the farmer often asks himself. The effect that preceding crops have upon the success and the yield of alfalfa is very well shown by the average results of numerous Iowa growers.

The largest yields of alfalfa were obtained when the alfalfa was preceded by winter wheat, a legume, barley or
grass. A large percentage of failures was reported, however, for seedings made with winter wheat. Alfalfa following rye yielded an average of three tons to the acre; the reason for this small yield is due to the fact that rye is usually planted on the poorest land. The smallest percentage of failures, however, resulted from seedings made after rye. The largest percentage of failures resulted from seedings made after millet. It is best not to seed alfalfa immediately after the millets or the sorghums. These crops leave the soil in poor physical condition. Approximately twenty per cent of failures occurred when alfalfa followed corn, potatoes or oats.

Alfalfa will not grow successfully on poorly drained soil. In this investigation it was shown that the tile-drained fields produced 3.9 tons to the acre, while natural-drained soils gave an average yield of only 3.6 tons an acre. Also, the percentage of seedings that failed was smaller in the tile-drained fields.

It is generally agreed that the best and most practical time to seed alfalfa is in late summer or early fall. However, the crop may be seeded with success in most any month, depending upon the section, though the chances of success are less when an attempt is made to seed the crop at a time other than in late summer or early fall.

The Iowa farmers reporting had made seedings in March, April, May, June, July, August, September and October. Almost half the number of seedings made in June and October were unsuccessful; one quarter were unsuccessful when made in April and July, and one-fifth when made in May and September. The smallest percentage of failures resulted from seedings made in August. The yields resulting from the different months of seeding do not show much difference. However, the average yield decreased for seedings made later than August, the percentage of failures increased.

Some farmers make their seedings at two small rates to get the best results from alfalfa. Numerous reports from the Iowa farmers show that the yield increases with the increase in the amount of seed used. Some farmers used
less than ten pounds to the acre, and consequently obtained small yields, while the few who used twenty-five or more pounds to the acre obtained an average of four tons to the acre.

More alfalfa seedings are made, and with greater success, when using from eighteen to twenty-one pounds to the acre. After several years there may not be much difference in yield from different rates of seeding. The greatest difference in yield noted by the Iowa growers was in the first and second years. Seedings should not be made of less than fifteen pounds to the acre.

Lime is usually applied before seeding alfalfa, but there are some who apply it after seeding. The relation of lime to the yield of alfalfa, and the results in the yields from liming before seeding compared with liming after seeding, were clearly brought out in the data compiled from the numerous reports. It was shown that the use of lime increased the yield of alfalfa more than half a ton to the acre, the average production being four tons as compared with three and four-tenth tons an acre where lime was not applied. Also, the greatest yield of alfalfa was obtained when the lime was applied before seeding rather than after.

The effect of cultivation upon the yield of alfalfa is a subject much discussed. Cultivating alfalfa greatly increases its yield under ordinary conditions. Of this most farmers are aware, yet many are in the dark as to the best implement to use in cultivating the crop.

From disk ing the alfalfa an average yield of 3.9 tons an acre was obtained by the Iowa farmers; from harrowing, 3.8 tons, and from no cultivation, 3.4 tons. In harrowing, the spring-tooth harrow is preferred.

Manure has a decidedly favorable effect on the alfalfa crop. Of more than 1200 alfalfa growers who reported, 728 applied manure and obtained an average yield of 3.9 tons to the acre, as compared with 3.4 tons for the average of the 508 cases in which no manure was applied. Thus manure increased the yield of alfalfa half a ton to the acre.
A nurse crop of some kind is often seeded with alfalfa. However, the farmer considerably reduces his chances for a successful seeding when he uses a nurse crop; also the nurse crop affects the yield to some extent, even if the seeding of alfalfa proves successful. An average yield of 3.6 tons an acre results from the use of nurse crops, and 3.9 tons when the crop was grown without any nurse crop.

When alfalfa is seeded with a nurse crop it is usually best to cut the nurse crop for hay rather than to permit it to grow for grain production. The growers who cut the nurse crop for hay obtained 3.9 tons of alfalfa to the acre, and only 10.3 per cent of the seedlings failed, while those who cut the nurse crop for grain obtained only 3.2 tons of alfalfa to the acre. 21.4 per cent of the seedlings were unsuccessful.

It is well to seed alfalfa after a legume, sweet clover and red clover being ideal. An average yield of 3.9 tons of alfalfa to the acre was produced after red clover, and there were only 17.2 per cent of failures.

Four common methods of thickening a stand of alfalfa were reported—drilled in, broadcast and disked, broadcast and harrowed, and broadcast without covering the seed. The percentage of attempts which failed to thicken the stand of alfalfa by drilling were calculated to be 17.1 as against 32.4 for broadcasting and disking; 33.3 for broadcasting and harrowing, and 37.5 for broadcasting without cover. It is indicated that when attempting to thicken a stand of alfalfa it is best to use a drill.

Alfalfa may fail from a number of causes, the most common of which is lack of inoculation, of lime, or both. The percentage of total failures in Iowa due to this cause was calculated to be 38.6 as against 7 per cent due to poor seed beds. The nurse crop is responsible for the next greatest number of failures, amounting to 16 per cent of the total. More than 11 per cent of the unsuccessful seedings of alfalfa were due to winter-killing and about 10 per cent to weeds. Lack of fertility, seeding too deep, poor drainage and insects were the causes to which many failures were attributed.
Farm Accounting

From "The Country Gentleman"

The new science of farm accounting is gradually beginning to assume definite shape. Such a science, producing the most practical results, is highly necessary. Our vast network of corporations, the immense volume of business done upon our exchanges, and, in particular, the elasticity of our industrial output, would not be possible without the highly co-ordinated system of accounting in use, which enables the heads of large enterprises to see at a glance how things are going, and to put their fingers on weak spots, thus saving immense sums.

Agriculture is more important than mills, factories, blast furnaces and railroads. It is from agriculture that these other activities arise. Yet in its system of accounting it has lagged behind all the rest. The farmer has been the sport of the financial charlatan, the fair game of the land shark, and all because it has taken us so long to perceive that farm accounting lies at the basis of all our national economic character.

When farm accounting, as a science of values, as an accurate indicator of loss and gain, shall rise to the same accurate standard as that of our leading corporations, a new era of solid and substantial progress will be inaugurated. Our yields per acre of all products will be steadily increased. The wide fluctuations in present-day values will cease.

Accounting bears the same relationship to the farm that the stabilizer does to the flying machine. The agricultural colleges have been a large factor in leading the way to a higher agricultural level. Every experiment station testifies to the importance of farm accounting. Every man who stands upon his own ground should come to realize what it means.
Value of Beet Crop By-products Not Fully Recognized

J. A. Brock
From "Facts About Sugar"

The value of sugar beet tops and leaves is an important factor in sugar beet cultivation which is being rapidly recognized by farmers throughout the United States. There are, however, a great many farmers who overlook or under-estimate the value of these by-products, to such an extent that they allow them to remain and rot on the field without rendering other service than that of returning to the soil certain mineral elements which have been absorbed by the growing beet.

While it is true that these portions of the plant contain a certain amount of salts which are beneficial to the soil, it has been demonstrated that this method of utilizing them is neither efficient nor economical. The farmer who derives the greatest benefit from these by-products is he who feeds them to his live stock and utilizes the manure for fertilization. Numerous tests have shown that by this method the fertilizing properties are not diminished. Hence by feeding the beet tops and leaves the farmer is able to return to the soil the desired elements in addition to supplying his live stock with a green forage at that period of the year when it is most relished.

Chemical analysis has shown that beet tops and leaves are highly nutritious. While the results of such an analysis will vary under different conditions, the following gives what may be considered as an average:
TliROUGl1 TliE LEAVES

<table>
<thead>
<tr>
<th></th>
<th>Leaves</th>
<th>Tops</th>
<th>Entire Beet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>89.01</td>
<td>80.15</td>
<td>81.6</td>
</tr>
<tr>
<td>Raw Protein</td>
<td>2.81</td>
<td>1.98</td>
<td>1.0</td>
</tr>
<tr>
<td>Fatty substances</td>
<td>.46</td>
<td>.25</td>
<td>.1</td>
</tr>
<tr>
<td>Nitrogen-free ext.</td>
<td>5.50</td>
<td>10.03</td>
<td>15.3</td>
</tr>
<tr>
<td>Fiber</td>
<td></td>
<td>1.90</td>
<td>1.4</td>
</tr>
<tr>
<td>Ash</td>
<td>2.22</td>
<td>5.69</td>
<td>0.6</td>
</tr>
</tbody>
</table>

It is evident that there is a very great difference between the tops and the entire beet, also that the tops or the necks have approximately double the nutritive value of the leaves. It is customary, however, to feed these in combination. It is to be noted also that the tops contain a higher percentage of salts than do the leaves, while the latter contain a higher percentage of raw protein. This, however, is balanced by the fact that the percentage of pure protein in the tops is approximately 1.25 against that of the leaves, which contain approximately only about .75 per cent. It should be taken into account that the tops, weight for weight, contain approximately double the nitrogenous constituents of the leaves.

It has been found in many cases where the tonnage of these by-products is low that the farmer is compelled to feed the leaves and tops immediately after or during harvest. In such instance it is advisable to chop them up. If stock is permitted to feed in the field, a large portion of the leaves are rendered inedible by the cattle treading on them. The same is true when they are fed from cribs. A further objection is that with either of the latter methods little or no regulation of the amount eaten is possible, whereas if they are chopped up the amount administered at each feeding is regulated exactly, which, as any farmer will agree, is preferable.

The average crop of leaves and tops is approximately 4.9 tons per acre. Of this, 25 per cent is composed of tops and 75 per cent of leaves. The nutritive yield is approximately 1400 lbs. of dry substance per acre, of which 2.28 lbs. are albuminoids, the value of which added to the amount paid by the factory for the roots, increases considerably the growers' returns from his beet tops.
In the case of the farmer who is not forced to feed these by-products at once, the following method is advised: Permit the leaves and tops to remain on the field from two to four days. During this period they will lose their rigidity, and consequently will settle properly when placed in the silo. Extensive experiments have been conducted for the purpose of determining to what degree the method of siloing exerts an influence. In one instance the leaves were placed in layers and well pressed when they were in more or less wilted condition, and covered with two or three feet of earth, while in another the usual method of siloing was followed.

The results of these two methods are shown in the following table:

<table>
<thead>
<tr>
<th></th>
<th>Layers</th>
<th>Regular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>74.97</td>
<td>79.66</td>
</tr>
<tr>
<td>Protein substance</td>
<td>2.90</td>
<td>2.65</td>
</tr>
<tr>
<td>Raw fatty substances</td>
<td>0.65</td>
<td>0.54</td>
</tr>
<tr>
<td>Extractable substances</td>
<td>8.68</td>
<td>7.59</td>
</tr>
<tr>
<td>Raw fiber</td>
<td>2.79</td>
<td>3.11</td>
</tr>
<tr>
<td>Mineral substances</td>
<td>9.68</td>
<td>0.14</td>
</tr>
<tr>
<td>Lactic Acid</td>
<td>0.33</td>
<td>6.31</td>
</tr>
</tbody>
</table>

It may be mentioned in this connection that in the “layer” method the leaves in wilting lose a certain amount of water, which may be considered an advantage.

The farmer who chooses either method is cautioned to remove all adhering earth from the leaves before siloing. This may be accomplished by shaking them. One of the common methods of siloing is to place the leaves in trenches about five feet deep and from four to five feet wide, the bottom having a slight slant to insure sufficient drainage. Another method is simply to place the leaves in piles and cover them well with earth.
In no instance should the leaves in the process of siloing be subject to excessive pressure. This practice is in vogue among a number of farmers, and it should be discontinued, as experience has shown that when beet leaves are subject to great pressure they lose a portion of their nutritive value. Another precaution which the farmer who siloes his leaves should adopt is to exclude all air from coming in contact with the mass after siloing. This is important, for, if the air does reach the mass after siloing there are liable to follow secondary reactions which are favorable to the existence of micro-organisms, the combined action of which ultimately will cause putrefaction to set in.

Several days after siloing the leaves become heated and a lactic fermentation follows, the mass taking on a dark brown color. If the siloing has been carried on in a proper manner the mass will remain in a perfect state of preservation for a long period. Due to the fermentation there is considerable softening of the leaves with the resultant diminution of volume. In many instances this exterior reduction has been as high as 50 per cent, the nitrogen loss being approximately 30 per cent. As a result of this shrinkage crevices in the earth covering are bound to appear through which there is a possibility of air penetration. These should be closed as soon as they appear.

It has been observed in some instances that the mass becomes excessively heated and instead of lactic acid there is formed acetic acid, resulting in an acetic fermentation which reduces the nutritive value of the leaves. How this may be avoided remains an open question. Various means have been suggested whereby the lactic fermentation may be hastened and some authorities have recommended the moistening of the leaves during siloing with sour milk; however, the results obtained thus far by this method do not warrant the recommendation of its general adoption.
Stutzer gives the following analysis of siloed beet leaves, which may be considered as fairly accurate:

<table>
<thead>
<tr>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
</tr>
<tr>
<td>Mineral substances</td>
</tr>
<tr>
<td>*Raw protein</td>
</tr>
<tr>
<td>Cellulose</td>
</tr>
<tr>
<td>Non-nitrogenous</td>
</tr>
<tr>
<td>Fatty substances</td>
</tr>
</tbody>
</table>

* The raw protein contained amides, 0.4 per cent and non-digestible nitric substance, 1.7 per cent.

Attention is called to the fact that judging from the excessive mineral percentage, revealed by this analysis, the leaves used in making it contained a certain amount of impurities which were no doubt introduced by the leaves having been in contact with the earth.

Some authorities have advocated the placing of cement bottoms in the silos for the purpose of collecting the liquid. The extra expense involved in this method does not appear to be warranted as there is no evidence of a resultant increase in the nutritive value of the final product, and it has been found where the liquid has been retained that the palatability of the product has been lessened.

Attention is called to the fact that by the addition of one per cent of common salt the conservation of siloed leaves may be increased. If salt is used the fact should be taken into account when feeding lest an excess of the condiment be administered to the animal. It has been demonstrated that the siloing of beet leaves in connection with some other forage is by far the most satisfactory method, due to the fact that in this way a more compact mass is obtained, thus reducing the possibility of air penetration.

In siloing these by-products it is advisable to chop the tops, it is never advisable to silo these parts of the plant separately, as they have a tendency to lose their nutritive value and ultimately rot; the usual practice is to alternate the leaves and tops with layers of straw which absorb the excess moisture thrown off and thus prevent the soil from absorbing it.
Horses in Food Production

Wayne Dinsmore
From "The Field"

No more dangerous situation can confront any nation than a shortage of horses. They constitute the chief source of power on farms. If the horses of the United States were to be wiped out of existence tomorrow by some great epidemic, it is safe to say that at least half of the people in this country would be on starvation rations, and that a large portion would perish for lack of food within the next two years, in spite of all that could be done with supplemental sources of farm power.

Other nations have surpassed the United States in the yield per acre of cereal crops. No nation has surpassed or even approached the best farming sections of the United States in the yield of grain per capita employed on farms. The production per man is greater in the States of Mississippi Valley and in the Canadian northwest than anywhere else on earth, and this is due entirely to the fact that in these sections the use of horse power has been developed to a greater extent than elsewhere. As a specific illustration it may be well to cite the fact that the writer in April, 1916, on a sixty-mile trip through central Iowa, kept an accurate record of the character of teams used in the fields.

In the day’s drive, teams were seen at work on practically every farm passed, but every man seen in the fields at work was driving either a four or five-horse team, with but one exception, where three big draft mares were seen at work on a manure spreader.

The advantage of using maximum horse power units in field work has become so clearly fixed in the minds of western farmers that four or five horses are used per man wherever the work will permit, and the use of heavier horses is steadily increasing. Sound farm experience has
conclusively demonstrated that maximum production of field crops at minimum cost can only be accomplished under the conditions just outlined.

With five powerful draft horses, weighing 1,600 pounds or over, in working condition, one farm hand can go into a field with a gang plow consisting of two 14-inch bottoms, followed by a disc harrow attachment, and average eight hours of actual driving during ten hours in the field. The driving speed will average two and a half miles per hour. This means that he drives 20 miles, turning and discing five and a half acres of soil in each day's plowing, and allows two hours time out of each ten hours for hitching and unhitching, for turns at the ends, for stops to give the horses a breathing spell, cleaning collars, and taking trash out from under the plow. This amount of work is actually being accomplished day after day on thousands of good western farms where the right kind of horses are available.

Experience has shown, however, that where the horses used are not heavy enough and strong enough, or where the number is insufficient, they will, by reason of being over-loaded, sweat profusely, become unduly fatigued and will be unable to make their 20 miles per day after the first few days.

To cite some specific instances, Charles Nelson, an Illinois farmer, used such a plowing outfit as has just been described with unquestioned success. He averages from five and a half to six acres per day for each outfit plowing. In disking he uses four draft horses on a 20-wheel disk harrow, cutting nine feet in width in the field, and disks from 15 to 18 acres per day.

George Lane, another western farmer seeds his wheat with a 20-hole disk seed drill, with four horses, and puts in an average of 20 acres per day, which is planted and covered in the same operation.

There are other men in the vicinity of these farmers who do not accomplish more than one-half as much per day, per man employed in the field, and the difference is entirely due to the number and kind of horses employed. A neighbor
of Nelson’s uses three horses that will weigh 1,400 pounds each on a single sulky plow cutting 16 inches. The best that he can do is from two and a half to three acres per day, while Nelson’s men are each turning twice as much. The neighbor, with his smaller horses, uses a disk that cuts but seven feet, instead of nine, and on account of the smaller horses, makes slower headway, so that he makes a turnover of only 10 to 12 acres per day in disk ing. In seeding he thinks he has done well if he has covered 12 acres per day with a disk drill. The man he hires charges for his labor just as much as the men employed by Nelson or Lane.

There is another aspect to this question which is even more important. The men who, with large implements and heavy horses, accomplish maximum operations in the daily turnover in the field are always ahead of their work. Their ground is ready when it should be ready; their seeding is done at the right time; the land is better prepared, for men with massive draft horses invariably plow deep and till their land well. George Lane, on some of his fields last year, harvested 46 bushels of wheat per acre. A neighbor, who did not believe in deep plowing and thorough preparation of the land, harvested but half as much.

There are some lines of work on the farm where four or five horses cannot advantageously be used, as in corn planting, corn cultivating first two times over, and mowing; but in all these lines of work, the heavy draft horses weighing 1,600 pounds and upward, if of the type and temperament, as they can be, are much more efficient than light horses, for their longer stride and greater weight enables them to cover a greater distance per day; and in such work as haying, larger mowers and rakes can be used so that the work actually accomplished is materially greater. In harvesting, seven or eight-foot binders can be used instead of the ordinary six-foot machine, and the amount of grain cut per day materially increased.

These are cold facts, borne out by the actual operations of thousands upon thousands of our successful western farmers. The man who is farming with small horses and an
insufficient number of them, and with small tools, does not realize how much more his crops are costing until he is actually shown what other men with big horses, plenty of them, and large machinery, are accomplishing in the same lines of production. Even then, he is oftentimes disinclined to change because he is afraid that his hired man cannot handle five horses, or fears that the cost of changing from the small machinery to the larger machinery will be too great. Neither of these objections is well founded. Any sixteen-year-old boy with average intelligence can drive a four or five-horse draft team without difficulty, and will be prouder of doing it than he will be working with small teams. The writer has personal knowledge of boys not yet fourteen years old who are driving successfully six-horse teams in regular work. Farm customs and traditions are hard to change, but if any farmer now using small horses and the smaller types of farm machinery, will consider carefully the difference in the cost of producing farm crops under the two systems, he cannot fail to be convinced of the necessity of changing to the system whereby maximum horse power units are used in farm production.

A comparison of tractors and draft horses is not within the scope of this article, but it would be incomplete if I did not call attention to the fact that a man may farm with tractors and horses, or with horses alone, but no farmer is operating a farm successfully with tractors alone. The sale of tractors to our farmers is already extensive, and will unquestionably increase very greatly. I expect, as the cost of tractors is reduced, to eventually see a good tractor on practically every farm, but it will be there primarily because the farmer needs a movable source of farm power which can be used at the barn for filling the silo; down at the granary a couple of hundred yards away for grinding grain; in the field for baling hay; at the hay barn for crushing alfalfa into alfalfa meal; and for the multitude of other uses for which a mobile power unit which can be relied upon to furnish dependable belt power, is needed. The tractor furnishes this, and it will incidentally, during
the hot summer and fall months, when the ground is very hard and dry, be available for some field work in fall plowing, but there is no likelihood that it will ever be generally used for field work, for farm conditions are not favorable to its successful operation in the field.

The very condition which is favorable to the use of a truck or tractor, namely, a hard road or a dry, hard footing is the very condition that is not desired in our grain fields and on our farms. Teams can be successfully and satisfactorily used in field work when tractors will either dig themselves in or cause grievous injury through packing the soil. A good illustration of this was noted by the writer on April 10th, on the farm of Dr. Thomas G. Ashton, near Philadelphia. Snow not yet entirely melted had left the top two inches of the soil soft and slippery, yet the men were busy loading and hauling manure on high-wheeled, broad-tired wagons which they were taking directly to the hill-side fields. Numerous manure spreaders were standing in the yard, but could not be used because of the slippery surface of the land made the driving wheels useless.

Theoretically, a tractor would have hauled out as much per load as the five teams which were in actual use. Practically, the tractor could not have made its way across the hill-side where the manure was actually being spread, without the use of tremendous mud spurs, and the soil, through packing, would have been left in unsatisfactory condition. Had the owner been relying on tractors, his men would have been idle at a time when every minute of delay meant loss.

W. S. Corsa commented within the last few days that he, relying entirely upon Percheron teams, was well up with his season's work; in fact, a bit ahead of the actual needs, while some of his neighbors, who had been relying upon tractors, were ten days or two weeks behindhand with their work.

Bitter experience in the greatest war the world has ever known has demonstrated conclusively that on the battle lines, horses, and horses alone, can be relied upon to put
men and guns where they are needed, when they are needed, regardless of trenches, ditches, plowed fields or shell holes. In peace, as in war, horses, and horses alone, can be relied upon to surmount every obstacle, and to make possible maximum efficiency.

The Farmer's Part in Tractor Success

Professor A. H. Gilbert
Dept. of Farm Mechanics, Purdue University

From "Successful Farming"

OVER 60 per cent of the Indiana farmers, from whom data was collected, reported that their yields have been increased since using the tractor. There are occasions on every farm annually, when weather conditions prevent preparing the seed bed properly, planting the seed in season, or harvesting the grain. At such times the tractor can be used long hours, or night and day, making it possible to thoroughly prepare the seed bed and plant the seed in season, both of which are conducive to larger yields. In some locations early plowing is considered essential for large yields of wheat. Very often at such times the ground is exceedingly hard and the temperature is such that plowing to the proper depth with horses is impossible.

In purchasing a tractor the farmer should require a guarantee from the manufacturer that the machine will deliver a rated horse-power at the belt wheel and that it will pull a definite number of pounds at the drawbar at a given rate of speed. At the same time the purchaser should obligate himself to see that the machine is given reasonable care and that it is efficiently operated.
Economical tractor service may be measured in three ways:
By reducing the expense of operation.
By increasing acreage farmed.
By increasing the yield.

The majority of tractors are purchased for the express purpose of having more power available at busy seasons without having so many horses to feed during the entire year, also to assist in solving the problem of hired help. There are many farm operations where one man with a tractor can do the work of three or four men and several horses. The work must be planned therefore, so that the tractor will do all of the heavy work about the farm leaving the lighter operations which the tractor cannot do economically for the horses.

In order to lessen the expense of operation the number of horses should be reduced to a minimum. Only such a number as is necessary for cultivation and which can be used to advantage during the greater part of the year should be kept. Actual data obtained from 120 Indiana farmers, who have used tractors for an average of 14 months on farms averaging 300 acres under cultivation, shows a decrease of four horses per farm. It is not recommended that a sufficient number of horses be disposed of to offset the price of the tractor, but in order to make the tractor reduce expenses, it is necessary to keep the tractor busy and dispose of all horses which cannot be used to advantage under normal conditions.

Reasonable care which a farmer should give his tractor in order to receive the best service may be summed up under the following points:
Careful lubrication.
Speed of the motor.
Overloading tractor.
Adjusting and repairing.
Shelter.

The matter of lubrication is a most important one. The direction book should be consulted often and the oils recommended therein should be used if possible. Men have
operated automobiles for four or five years and never found some of the important oil holes. The tractor, however, would not stand up under such conditions because the majority of its power is used continually and all parts need thorough lubrication. A good rule to follow is that, whenever two surfaces come together, one or both of them moving, they need lubrication. The amount and kind of lubricant depends upon the speed of moving parts, size of bearings, pressure exerted and temperature. The company manufacturing the machine should know best the grade of oil necessary for the various parts.

Not long ago the writer was called upon to investigate the cause of a burnt-out bearing on a kerosene engine. On examination it was found that a very light grade of automobile oil was in the lubricator instead of the heavy, heat-resisting oil recommended by the company in their instruction book.

The motor is balanced to do its best and most efficient work within a given range of speed. It has been tested and found to develop the rated horse-power at the normal speed published in the catalog. For this reason the governor should not be changed to make the motor exceed its rated speed. When the motor is standing idle, it should be throttled down slowly to prevent excess vibration and at the same time to economize on fuel.

When purchasing it is advisable to get ample power for the work required. Many farmers purchase 8-16 tractors, expecting them to draw three 14-inch plows under all conditions but some are disappointed. A 14-inch plow bottom cutting seven inches deep averages 400 to 600 pounds draft, or for three bottoms 1200 to 1800 pounds. The 8-16 tractor at full load should be capable of exerting a force of 1500 pounds at the drawbar at two miles per hour, or 1200 pounds at the rate of two and one-half miles per hour. It is a mistake for manufacturers, therefore, to advise a three bottom plow under such conditions, even though one bottom can be removed. A 10-20 or a 12-20 tractor is the minimum size tractor which should be used with three 14-inch plows on the average farm.
The manufacturer after all has very little business guaranteeing any definite number of plows for his tractor until thoroughly familiar with the type of land. As stated above he is safe in guaranteeing his machine to pull a definite number of pounds at the drawbar at a given speed.

Many purchasers are of the opinion that the tractor requires practically no attention. They seem to think that all that is necessary is to put a little gasoline or kerosene in the tank. To fill fuel tanks, lubricate the tractor thoroughly and examine the machine for loose or wearing parts requires time. The art of successful operation lies in the ability of the operator to keep all parts in good adjustment and repair, also to notice the need of such adjustment before damage is done.

The Care of the Work Horse

Thomas P. Cooper
Director North Dakota Agricultural College

From "Reclamation Record"

The work horse is one of the most needed and valuable accessories to the average farm. The successful farmer realizes this, and on 99 out of 100 profitable farms good horses well kept and well cared for will be found. Normally the climate and air of North Dakota give high efficiency and a long life of usefulness to the work horse. All he needs to insure these qualities is a little care and proper feeding. On the average grain or mixed farm, conditions are such that during a considerable part of the year the horses much work hard and long hours to make up for time lost. Obviously in order that a horse may retain his flesh and health during these busy seasons he must be especially well fed and cared for, while during the idle periods he may be fed much less and much more economically. While at hard work the important features of feed and
care are: First, regularity of feeding and watering; second, the use of good, clean, sound hay and grain; third, the use of collars and harness that fit properly; and fourth, a comfortable stall in which to sleep.

No feed has yet been found that will wholly take the place of good, clean, plump, hard oats as a grain for the work horse. A ration, however, a little cheaper than oats alone and one almost as satisfactory can frequently be made by substituting corn, barley, or bran for from one-fourth to one-third of the ration. While at hard work a horse should receive grain three times per day. The amount of grain to be fed will depend on the size of the horse and to some extent upon the quality and amount of hay fed. The ordinary horse of strong conformation and good digestive capacity will do well on from $1\frac{1}{4}$ to $1\frac{1}{2}$ pounds of grain per 100 pounds of live weight per day; that is, a horse weighing 1,400 pounds should average from $17\frac{1}{2}$ to 21 pounds of grain per day. The morning and noon feeds of grain should be somewhat heavier than the evening feed and the morning and noon feeds of hay must necessarily be somewhat lighter than the evening feed, since the horse ordinarily does not get time to eat a large amount of hay either in the morning or at noon before going to work. Where good sound timothy hay is used the average horse at hard work requires about the same amount of hay per day by weight as he does of grain. The heavy hay feed should be in the evening. For instance, a good method of dividing the feeds for the 1,400-pound horse would be as follows: Morning feed, 8 pounds grain, 5 pounds hay; noon feed, 8 pounds grain, 5 pounds hay; night feed, 5 pounds grain, 11 pounds hay.

While timothy hay is recognized as the one best roughage for the work horse, a good quantity of upland prairie hay, redtop, clover, or alfalfa can be very satisfactorily substituted for it. The reason why timothy usually gives better satisfaction is because it is easier to cure and store and keep in good condition and free from dust than the other hay crops.

When at hard work and on full feed the horse should
have at least one feed a week of mild laxative nature, such as some boiled flax, boiled oats, boiled barley, or a warm bran mash. Also, on Sundays or on days when part of the horses may be idle, the grain for these days should be reduced to three-fourths the regular amount in order to prevent the development of a case or two of azoturia. Watering is important. A horse that is thirsty should be watered before he is fed grain or hay, rather than after. The reason for this is that the stomach of the horse is comparatively small and if he eats a heavy feed of grain or hay, or both, and then drinks a large quantity of water a portion of the feed will be washed from the stomach into the intestines before it has been sufficiently acted upon by the digestive fluids of the stomach, and colic is likely to develop. The regular practice should be to water before feeding. Also the horse should be given plenty of time to drink.

Where salt is not mixed with the feed it should be before the horse at intervals of not more than a few days. Where it is mixed with the feed, about 1 ½ pounds should be used with each 100 pounds of grain.

The fitting of the harness and collar is a very important item to the efficiency of the horse. Sore necks are caused by a collar that is too short, by one that is too narrow at the neck, or too wide so that it works back and forth. Also the use of a harness without breeching on horses that are worked on implements with tongues requiring considerable backing, such as a drill or mowing machine, will cause sore necks. Sore shoulders may be caused by a collar that is either too long or too short or even if the collar is fairly well fitted but with hames that are too long. Some horses get sore shoulders on account of faulty conformation of the shoulder itself; for instance, an extremely straight shoulder is liable to throw collar boils or galls on the shoulder points because of the impossibility of properly distributing the pull on the full length of the shoulder. Properly fitting bridles are a great help in sim-
plifying the driving, as also are the use of bits suited to the disposition and toughness of the mouth of the horse. Ordinarily a straight smooth bar bit is the most satisfactory kind to use, although most horses drive just as well with the simple snaffle bit.

Care in the adjustment of the hitches of double-trees where three, four, or five horses are used in one team so the pull is equalized is important, also the proper length of checks and connecting lines to avoid the jerking of one horse by another is important. Anyone who has driven horses knows how quickly the flesh disappears from a nervous, quick-moving animal when used with several slower ones and everything possible should be done to reduce this nervousness in horses. The proper time to develop the right disposition is when the young colt is being trained to drive. In starting young colts they should always be hitched with a horse that has a desirable disposition and a desirable speed at the walk.

If the work horses are properly cared for and fed in summer the wintering of them will be a simple matter, for they may then be wintered largely on cheap rough feed, such as oat straw, prairie hay and fodder. If low-grade roughages such as the above are used in winter it is sometimes necessary to use 4 or 5 pounds of grain per day in order to maintain them in good flesh. Idle horses should be turned out for exercise every day in winter except on the few stormy bitter cold days that are to be found in nearly every winter.
THROUGH
THE
LEAVES

OCTOBER, 1917
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NOTES

N. R. McCreery

Once again our harvest is on.

We are bending every energy to make this one of the best harvesting seasons we have ever had, and barring unfavorable weather conditions, we believe you will have no reason to say that we have not done our part. Of course, dealing as we do with so many growers, and having so many new men in our employ, it is impossible to get away from an occasional mix-up of ideas, but we want our employees to render you the best service possible, and will be glad to have reported to us any discourtesy on the part of any of them.

+++

The question of tare is always with us during the harvesting season. We want you to advise us if you have any complaint. Please do not wait until next spring and then tell us that you were not treated fairly in your tare. Tell us as soon as it happens and we will be in a position to investigate it and make corrections if a mistake has been made.

It is very likely, from all indications, that we will have a shortage of railway equipment, and also that our cars will not be moved just as we would like to have them. We are hopeful, however, that early piling will eliminate delays that you would otherwise be subject to. We are certain that if you will co-operate with us in the handling of the crop at the dumps you will find that we are going to meet you more than half way.
PULP

In view of the very unsettled conditions of the market we have been very much surprised at the large number of applications we have received for beet pulp. The total acreage represented by those making application was, in round numbers, 11,000 acres, and as we will have only about 45,000 tons of pulp this year you can readily see that an allotment of 4 tons per acre was all that we could make at the time our notice was sent out. We can understand that an allotment of 4 tons per acre is not sufficient for many of you to feed the same number of cattle you have in the past under the same conditions and in the same manner, but it is impossible for us to allot more pulp than we will have. It is probably true that the high price of all other feed stuff in comparison with beet pulp, will probably induce a large number of beet growers to feed small quantities of pulp to their milk cows and that the pulp will thus be distributed over a greater area and among a greater number of people than in past years. In this connection we might suggest that you read Mr. Mendelson's article on this subject in this number.

We are frequently asked the question: "How much pulp will a ton of beets make?" and when we answer from 25 to 27 per cent of their weight, some are inclined to accuse us of untruthfulness. This, however, is about the average we have received for the past two years since our new silo was completed, and it is on this basis that we have made our allotment this year.

At the time we are going to press no arrangement has been made regarding the price of beets for next year. We understand that Mr. Morey has promised the growers that a meeting will be held as early in October as possible of the directors of the Sugar Company and at that time the price of next year's contract will be determined. He also promised that this would be on just as liberal a basis as conditions at the present time would warrant the Company in making. We know that a minimum price for
wheat has been established; on the other hand a maximum price for sugar has been established. This puts the two commodities on an entirely different basis, as the one with the minimum price can go up while the one with the maximum price can go no way but downwards. It seems very improbable at this time that the price of wheat will go up in view of the increased acreage that is to be planted throughout the entire country this coming season. On the other hand the sugar supply and demand is so evenly balanced at the present time that it is hard to tell whether or not sugar will continue at its present price. With an established price for wheat this does not eliminate the factor of a hailstorm to which a very large part of our district is subject. It also does not eliminate bad weather conditions which may cause rust and falling of the grain. As near as we can judge, from conversation with our various growers, we believe that it is going to be the intention of a very large part of them to plant approximately the same acreage they have been planting in past years. We have been more or less apprehensive all season of a labor shortage, yet we do not remember any season when we have been able to secure labor as easily for pulling and topping as we are doing this fall. Another thing to be borne in mind is that if this beet labor had not been available during the summer season for other farm work there would have been a much more serious shortage of labor than there has been experienced this last summer. A moral to all this is: You should grow as many sugar beets next year as you did this.

+ + + +

Your beet help is under contract to cover your beets in the field at night. You will eliminate, more or less of the difficulty at the dumps of hauling frozen beets if you will insist on their doing this.

+ + + +

We would urge that you see that the weight of your load is called out before leaving the scales. This will save you trouble in trying to secure an adjustment afterwards.
You can realize how hard it is to tell what a load weighed after the load has gone over the scales and been dumped.

In view of a possible shortage of teams and equipment for hauling beets, we want to again call your attention to the advantage of siloing a portion of your crop. We do not presume there will be enough beets siloed in the Longmont district to make it worth our while to urge you to do this; on the other hand we can see many advantages to some of the growers with a large acreage if they silo a portion of their crop. We call your attention to some photographs of beets siloed in the Scottsbluff district by the beet growers. We understand that 33% of their crop was siloed last year, or a total of some 130,000 tons of beets. If you find you are going to be short of teams and help to get your beets to the dump in good season, do you not think it would pay you to put some of these beets in silo? We will pay $1.00 per ton extra for all beets so siloed and will order them delivered as soon as the direct delivery beets are finished. If you desire to take advantage of this kindly communicate either with this office or with the field man in charge of your district.

We were very much pleased with the high class of livestock exhibited at the Boulder County Fair. Pictures of some of these are shown elsewhere in this book. The value of the Fair as an educational institution is beginning to show itself very plainly in the improved live stock that is being exhibited from year to year.

REGARDING MOLASSES

It is very important if you desire to use any molasses this season that you notify us at once. With corn at approximately $60.00 to $70.00 per ton, molasses at $25.00 is a very cheap feed. We cannot reserve any molasses for you this year unless we have a contract on file in our office covering your requirements.
Fifty Steers, 20 Acres Beet Tops and 80 Tons Pulp

H. Mendelson

An unprecedented number of farmers have made reservations for pulp. Therefore the amount of pulp available for each farmer is rather small. In Longmont, for instance, the present allotment is only four tons of pulp per acre of beets. On this basis the average farmer with twenty acres of beets will receive at Longmont 80 tons of pulp.

In the past most farmers have figured on five to seven tons of pulp per steer. If only the allotted amount is fed, a man with 20 acres of beets can finish only 11 to 16 head. A great many farmers claim that this is too small a number to bother with. Generally at least one carload, and preferably two, is the quantity most economically handled.

If the farmer with a limited amount of pulp still wants to feed this number, he has to make available more feed either by using more efficiently what has been used in the past, or by other feed of the same quality as pulp. Not very many farmer steer feeders in the past have bought additional feed besides the pulp and molasses, although professional feeders have done so in a number of cases. An experienced feeder who stays with the game can judge better how much money he can profitably put in a steer, while the inexperienced farmer might be afraid of it. Besides, pulp being notoriously a cheap food, there is no profit in using more expensive feed as long as the available quantity of pulp is sufficient to finish the steer to the desired weight.

It is obvious that increased demand for pulp is due to the expectation of another profitable feeding season. Last year everybody made money feeding because the difference in the price of lean and fat steers was unusually high. In one large feeding operation the steers were bought during the summer of 1916 at $7 per 100 pounds.
laid down at the feed yards, while the net price received for these steers, minus freight and commission, when sold during March, April and May, was about $11.50 per 100.

In this case the lean steers weighing about 950 pounds cost $66.50 per head, while the fat steers weighing about 1180 pounds brought about $135.00 per head, leaving a margin of $65 per head.

There is at present no reason to assume that the average price of fat steers is going to be less than last year. Really finished steers are very scarce on the market and therefore command a very high premium over common steers. For instance, the Chicago Daily Growers Journal gives the following representative sales on Monday, September 17th:

38 steers @ 1371 pounds @ $17.85
18 steers @ 1271 pounds @ $16.25
20 steers @ 1176 pounds @ $15.50
50 steers @ 1249 pounds @ $15.35
22 steers @ 1115 pounds @ $15.00
8 steers @ 1246 pounds @ $13.55
21 steers @ 1170 pounds @ $13.15
23 steers @ 1181 pounds @ $13.00
36 steers @ 1380 pounds @ $13.00
8 steers @ 1212 pounds @ $12.90
48 steers @ 1207 pounds @ $12.60
20 steers @ 1327 pounds @ $12.25
25 steers @ 1130 pounds @ $12.25
40 steers @ 1077 pounds @ $11.50
39 steers @ 1018 pounds @ $11.50
21 steers @ 1064 pounds @ $11.25
41 steers @ 1061 pounds @ $11.15
26 steers @ 1085 pounds @ $11.00
22 steers @ 1012 pounds @ $10.90
32 steers @ 1157 pounds @ $10.75
24 steers @ 1108 pounds @ $10.65
22 steers @ 1221 pounds @ $10.65
31 steers @ 1090 pounds @ $10.50
37 steers @ 562 pounds @ $10.50
25 steers @ 874 pounds @ $10.50
21 steers @ 886 pounds @ $10.50
And so on down the line to lots weighing from 550 to 700 pounds, bringing from $6.25 to $7.00.

These differences in price are of course not due mainly to manipulation of the market by the packers, but to the greatly differing quality of the steers. It is, for instance, interesting to note the high priced lot of 38 steers weighing 1371 pounds bought at $17.85 and a lot of 36 steers weighing 1380 pounds, bringing only $13.00. If market conditions of this kind prevail it is evident that more money can be made by putting a higher finish on a smaller number of steers than by selling a larger number half finished. Besides, if the market should go against you, you or your banker take less chance on the smaller number.

This should be emphasized particularly at a time when many inexperienced men get into the feeding game. Of course if there are more animals fed than there is food to finish them, somebody will have to sell unfinished stuff, but under these conditions it might be better to let the other fellow do that.

In looking over the steers marketed by many of our farmer feeders, it is clear that many lost money in the past or at least did not make as much as they might have if they had not handled more animals than they had feed for.

Probably good feeders will be higher this year than last year, and if the average price obtained for the fat stuff is no more than last year, the total amount which can be profitably spent for food may be less.

Prediction of prices of livestock is not an exact science. Therefore it is unsafe to advise positively how much money a feeder can profitably spend on a steer. However, if you do not want to go blind in this game, you must make some guesses at the probable outcome. The following is merely one kind of a guess. Everybody is at liberty to substitute his own guesses.

Supposing you buy some good feeders weighing 900 pounds at $9 per 100 pounds, or $81 per head at your feed yards, and you want to feed them long enough to weigh when sold 1150 pounds, which presumably can be done in 150 to 160 days, indicating a gain of a little better than
1.5 pounds per day. If these steers, after paying freight and selling expenses, net $11 per 100 pounds, you obtain, per head, $126.50, allowing you to spend a maximum of $45 per head without losing any money.

If you feed a little heavier during this time, making more gain and producing a better finished animal, weighing 1200 pounds, and bringing $11.50 per 100 pounds instead of 1150 pounds at $11.00 per 100 pounds, you obtain $138.00 per head, allowing you to spend $57 per head without losing any money.

In case of the lighter animals marketed at $11.00 per 100 pounds, the 250 pounds gain are worth $45.00, or $18.00 per 100 pounds; in the case of the heavier and better fed animals, the 300 pounds gain are worth $57.00, or $19.00 per 100 pounds.

Now, if a gain of 250 pounds can be made in 150 to 160 days by feeding pulp and alfalfa in the quantities usually assumed and mentioned in the beginning of the article, namely, 1 ton alfalfa per head and 5 to 7 tons of pulp, the feeding expenses per head at market price will be:

1 ton alfalfa @ $15.00 = $15.00
5 to 7 tons of pulp including cost of hauling @ $1.30 per ton = $6.50-$9.10. Interest on $81 for 5 months at 1% per month = $2.00, or a total of from $23.50 to $26.10 per head. Since we found the difference of receipts for the 1150 pound steers and the cost of the 900 pound lean steer at the prices quoted as $45.00, there would be left a profit of $21.50 to $18.90 per head. This sounds very attractive on the surface.

If these steers get nothing but the food mentioned, the following quantities will have been consumed per 100 pounds gain:

4,000-5,600 pounds of pulp
800 pounds of hay

In the feeding operations of our Company, we have used per 100 pounds gain:

about 7500 pounds of pulp
240 pounds of molasses
760 pounds of hay
87 pounds of cottonseed cake
In addition to molasses and cake we used also a great deal more pulp. Undoubtedly some feeders with choice animals can do better than we can on an average of many thousands. In fact not many farmer feeders ever admit of making less than two pounds gain per head per day, while we do not obtain more than 1.5 pounds. Of course, a farmer feeder feeding pulp on the farm will use his beet tops.

The average farmer has about 20 acres beets. If he feeds 50 steers he possibly will get 40 days full feed out of the 20 acres and therefore his pulp allotment will be used up during the rest of the feeding season.

If the air-dry tops amount to two tons per acre, there will be about forty tons altogether, or 1600 pounds per steer, or about 40 pounds per day, if eaten in forty days, or less if the feed is spread over more days. From what we know about the analysis of beet tops, and from the fact that quite a number of feeders have actually obtained the 250 pounds gain per head with one ton of hay, 5 to 7 tons of pulp and 0.4 of an acre of beet tops, this quantity may be considered a standard ratio for a fattening steer.

On the basis of the present allotment of pulp of four tons per acre of beets, the 20-acre farmer wanting to feed 50 head has only 1.6 tons pulp per head and therefore has to provide the equivalent of from 3.4 to 5.4 tons of pulp per head, or a total of from 170 to 270 tons. There is no possibility of providing this additional feed in a form nearly as cheap as pulp. The following feeds may be considered:

- Molasses at $25.00 per ton
- Dry pulp at $25.00 per ton
- Cottonseed cake at $35.00 per ton
- Barley at $50.00 per ton
- Corn at $50.00 per ton
- Bran and mill feeds at $30.00 per ton

The price of barley and corn is the present one, probably both will be lower by November or December, although nobody can foretell how much.

The full amount of dry pulp available at each factory.
where wet pulp is produced, is 300 tons. 1 ton of dry pulp may be assumed to be equal in feeding value to about 10 tons of fermented pulp, and more of green pulp. Therefore from 17.0 to 27.0 tons of dry pulp will give you enough feed to finish 50 head at an increased cost. 1 ton of molasses may be assumed to have the feeding value of 6 to 8 tons wet pulp. Therefore 30 to 45 tons molasses theoretically will take the place of 170 to 270 tons of wet pulp, but the steers could not profitably eat that much. 3 to 4 pounds per head per day is a normal feed, or 500 to 600 pounds per head per feeding season, or 12 to 15 tons for the lot of 50 head.

100 pounds of corn or barley probably have the feeding value of 1100 pounds of wet pulp. Therefore it will take about 15 to 25 tons of corn to replace 170 to 270 tons of wet pulp. This is $750 to $1250 at present prices, or $15 to $25 per head.

Cottonseed cake will not take the place of pulp, but is the same kind of food as alfalfa only more concentrated. The real food value may be about 3 to 4 times that of alfalfa.

Pure bran is also not quite a substitute for wet pulp or corn, and comes nearer in quality to alfalfa. On account of its being finely ground, the animal gets about twice the food value out of bran than out of the same quantity of alfalfa, although the conventional analysis does not show much difference between the two. However, many dairymen have been in the habit of feeding bran with alfalfa with good success.

Mill feeds, such as shorts and middlings, are preferable to bran.

It is a curious fact that many of our local mills in Northern Colorado are not able to dispose locally of the mill by-products, but have to ship them. These are products which can be used if we want more local feeding.

An acre of wheat yielding 40 bushels, or 2400 pounds, will produce about 320 pounds bran and middlings. Most everybody has 20 acres of wheat, entitling him to about 6400 pounds of such feeds.
To replace 170 to 270 tons of wet pulp by a mixture of molasses, corn or barley, and mill feeds, in such quantities as the steers will readily consume, will take about:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 tons molasses @ $25.00</td>
<td>$300</td>
</tr>
<tr>
<td>6 tons bran or middlings @ $30.00</td>
<td>180</td>
</tr>
<tr>
<td>6-9 tons corn or barley @ $50.00</td>
<td>300-450</td>
</tr>
</tbody>
</table>

Total $780-$930

This will give you per head for the whole feeding season:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 acres of beet tops</td>
<td>$2.40</td>
</tr>
<tr>
<td>1 ton of alfalfa</td>
<td>15.00</td>
</tr>
<tr>
<td>1.6 tons of wet pulp</td>
<td>2.08</td>
</tr>
<tr>
<td>480 pounds of molasses</td>
<td>8.00</td>
</tr>
<tr>
<td>240 pounds bran and middlings</td>
<td>3.60</td>
</tr>
<tr>
<td>240-360 pounds corn</td>
<td>6.00-9.00</td>
</tr>
</tbody>
</table>

Total $37.00-$40.00

not calculating interest and labor except on hauling the wet pulp.

We calculated above that if you buy a lean steer of 900 pounds at $81 and sell the fat steer of 1150 pounds at $126.50, or at $11.00 per 100 pounds, you can spend $45.00 altogether to fatten him, without losing any money.

If this steer gains 300 pounds and you sell him at $11.00 per 100 pounds, you can spend $57.00 without losing any money. It therefore appears that if your steer gains only 250 pounds, sells at $2.00 higher per 100 pounds than you bought him, and you buy the feed at the prices mentioned, you have not much chance at making any money. You could cheapen the feed bill by buying dry pulp instead of bran and middlings. These feeds are about equivalent in feeding value.

The corn and barley, of course, also can be replaced by dry pulp. In the quantities fed it will take about 9 to 12 tons to do that. It would, therefore, take 15 to 18 tons of dry pulp, or $375 to $450 worth to replace $480 to $630 worth of bran, middlings, corn and barley, or a saving of
$100 to $180 for the whole feeding operations, or $2 to $3.60 per head. Of course, the supply of dry pulp is so limited, that not many farmers can get it.

To Sum Up:---

50 steers have been fed in the past with fairly satisfactory results on 20 acres beet tops, 1 ton alfalfa and 5 to 7 tons pulp per head.

If 900-pound steers are bought at 9c per pound, or $81 per head, if 250 pounds gain per head are made and if the fat steers sell at 11c per pound, or $126.50 per head, the total margin available per head for feeding expenses and profit is $45.

The cost of feeding with wet pulp may be calculated at

1 ton alfalfa $15.00
5 to 7 tons pulp laid down at feed yard 6.00-9-10
Interest on $81 for 5 months 2.00
or $23.50 to $26.10 per head.

From present indications there is pulp enough available to give a farmer with 20 acres of beets and 50 steers 1.6 tons per head.

To finish these 50 steers by additional food, it will take

12 tons molasses
6 tons bran and middlings
6-9 tons corn or barley,
at a total cost of $37 to $40 per head, together with alfalfa, wet pulp and beet tops.

The same feeding result probably can be accomplished with

12 tons molasses
15-18 tons dry pulp
at a cost of $35 to $37 per head of the dry pulp can be obtained.

The margin of profit is small if the prices of additional foods are those prevailing at the present time, and if the difference per 100 pounds of lean and fat steer is only $2.00.

This may be a pessimistic view of the situation. If you are an optimist you can figure on cheaper food and on higher prices for fat steers.
A Bit of History

A. C. Maxson

DURING the early seventies the rich prairie soils of western Minnesota attracted many homesteaders so that by the summer of 1876, which is known as one of the worst grasshopper years in the history of American agriculture, the vast expanse of these prairies was dotted with claim shanties, tree claims and green fields.

The first of June of this memorable summer all crops gave promise of a bountiful harvest. Then vague rumors of great hordes of grasshoppers which were destroying crops in the southwest caused much apprehension among the settlers, many of whom had spent their last dollar in the planting of their crops, fully expecting the harvest to be sufficient for future needs.

About June 20th great swarms of hoppers began flying over, coming from the northwest and always traveling to the southeast. The suspense of the homesteaders had almost reached the breaking point when the wind changed and the long dreaded thing happened.

Suddenly, about 10 o'clock in the forenoon of July 5th, persons in doors were startled by a loud, rushing sound, like that of an approaching storm. Upon going outside a sight long to be remembered met their eyes.

From the sky, like huge snow flakes, hundreds of millions of Rocky Mountain locusts were dropping to earth. This living shower lasted for about 30 minutes when it ceased as suddenly as it began.

The ground was literally covered with a seething, kicking mass of hoppers 3 and 4 deep. Gradually this struggling horde became quiet, resting in regularly arranged rows and layers.

In this position they remained for about 4 hours when the work of devastating the fields began. Their work was rapid and thorough and the destruction complete.
The writer's father describes the work of the hoppers in a corn field as follows:

"After having rested for about four hours those hoppers next to the corn stalks began to feed upon them near the ground. As this weakened the stalks they fell and were immediately attacked by other hoppers. Stalk after stalk fell until about sundown when feeding ceased for the day, less than 100 stalks remained standing on a 4¼-acre field. When the hoppers left this field not a vestige of the crop remained excepting the stumps of the corn."

Garden truck, with the exception of peas was completely destroyed also. Root crops, such as beets and turnips, were eaten leaf and root. Where each plant stood only a hole in the ground remained. As they devoured these roots the ravenous hoppers fought for a place until their bodies and extended legs resembled a bundle of small sticks set on end in a small bowl.

The third day the hoppers rose and started in a south-easterly direction. They disappeared as suddenly as they came, leaving only bare ground and disheartened farmers behind. This swarm covered an area of about 100 square miles.

Nothing more was seen of the hoppers until early August when a second, but smaller, swarm settled on the cropless country covered by the earlier swarm.

This second army found little but prairie grass to feed upon. This furnished sufficient food for them until they had honeycombed fields and prairie with their egg pods.

The following spring the whole country was a hopping mass of young Rocky Mountain locusts. Now the fight to destroy this growing army and save what crops had been sown, began.

All of the young hoppers traveled in one direction. Whichever way they started in the morning was the direction for the day. While they were still small, trenches were dug in front of the insects into which they fell and in which they were buried.

The hopper dozer played its part in the fight against the young hoppers as they became larger and more active.
By constant fighting some crops were partially saved at an enormous cost of time and hard labor.

About the first of June the hoppers having acquired wings, they took flight for parts unknown. With the exception of very local outbreaks which have been quickly brought under control, the Rocky Mountain locust has never since appeared within the bounds of the vast territory devastated during 1875 to 1877. In those parts of its range where it was most numerous during those years it is almost unknown at the present time.

Thus, one of the most destructive insects of the western hemisphere came, devastated vast areas of crops and passed on, never since to appear in anything like the same numbers in any part of its former range.

**Enlisted in the Nation's Service**

*From "Facts About Sugar"*

The action of the beet sugar producers of the country at their meeting in Washington this week in agreeing to accept a price for their coming crop more than a cent a pound below the prevailing market level sets the striking and unique example of an entire industry placing patriotism above the pocket book in this hour of the country's need. Many sacrifices are being willingly made by men in many industries to aid in the winning of the war, but such unanimous action on the part of a great national industry in voluntarily agreeing to relinquish a not unreasonable profit, is, we believe, without precedent.

Just as the domestic beet sugar industry was the first to volunteer its co-operation with the national government following the entrance of the United States upon the war, so it has not waited to be conscripted by the Food Administration, but has come forward and enlisted in the national service, testifying its patriotism in a most practical manner. The voluntary relinquishment of the bene-
fit of the consumers of the country of a sum that will amount, probably, to $20,000,000, or more, is in itself no small matter, but the spirit behind the act is worth more to the nation than the millions involved.

If the course adopted by the beet sugar industry meant merely a division with the public of exceptional profits created by conditions arising out of the war it would be noteworthy enough, but it involves far more than that. Owing to the rapid increase in price of everything that enters into the cost of production, it means that some of the beet sugar companies face the prospect of coming to the end of the season with a net loss instead of a profit from their operations. Their stockholders, who are subject to all the other heavy taxes imposed by the war, will be called upon to submit to an additional and exceptional burden. Only a national emergency, such as now confronts us, could justify their representatives in agreeing to the proposal. The decision of the beet sugar men means also, as their letter addressed to the Food Administrator shows, that they are assuming the risk of a serious curtailment in production next season. With high prices in prospect for practically all other farm crops and guaranteed by the Government in the case of wheat growers, an appeal to the patriotism of beet growers to maintain the production of this essential food crop is apparently the only possible means of preventing a serious decline in the acreage devoted to sugar beets. The labor and seed situations are both critical and call for the prompt co-operation of governmental agencies. Such co-operation undoubtedly will be given and it is to be hoped that it will make possible a satisfactory solution of the serious problems confronting the industry.

The action of the beet sugar producers has added substantially to the debt which the public owes this industry. It has given a new and instructive demonstration of the national economic value of sugar production from our own soil. Perhaps it will lead in the future to fairer treatment and fewer selfish attacks than the industry has experienced at times in the past.
BOULDER COUNTY FAIR
(1)--Judging Draft Stock; (2) and (3)--George J. Miller's Stallion "Joliet;" (4)--F. W. Muhme's String.
BOULDER COUNTY FAIR LIVESTOCK
(1)—Owen Stephens; (2)—Lee Johnston; (3)—Geo B.
Owen
BOULDER COUNTY FAIR LIVESTOCK
(1)--J. M. Wisecup; (2)--Fred N. Smith; (3)--Dolph E. Smith
132,000 TONS BEETS SILOED IN SCOTTSBLUFF DISTRICT LAST YEAR

When photo was taken, this silo was 10 ft. high, 128 ft. long, base 28 ft., top 10 ft., using two panels.
132,000 TONS BEETS SILOED IN SCOTTSBLUFF DISTRICT LAST YEAR

This silo contains product of 14 acres. Two 14 ft. panels were used in building it. Capacity 224 tons; height, 10 ft.; base 28 ft.; top 10 ft.
Littleton and Arvada Beet Growers at the Longmont Factory
A Common Scene in Northern Colorado Beet Fields at this Time of Year
Attractive Farm Home of Albert Lund, South of Longmont
At this time of the year a farm either shows up at its best or it takes on that careless, neglected appearance that is brought about by unrestrained weed growth, inattention to fences, dirty ditches, and, in general, allowing everything that will mar the appearance, to accumulate through a spring and summer of strenuous field work. Why is it that a neat looking place and a successful farmer are usually associated? Again why are some people so easily satisfied with the dirty surroundings of the place they call home? It is not necessary to have expensive buildings and spend a lot of money in order to have a place clean, tidy and home-like. There is a place not far from Longmont, that furnishes a good example of what can be done along this line. The farm to which I refer has only a very small house, rather limited and small farm buildings, and three years ago was certainly anything but an attractive home. However, it looked no worse (or no better) than many others, but today that is one of the most attractive farms along the road. No new buildings were put up and a careful inspection will show that the transformation was entirely due to a careful cleaning, planting of flowers, grass, some paint, a little careful planning and arranging and a good desire to have a home. We are sorry we cannot show a picture of this place as it was and now, or “before” and “after,” but unluckily the owner did not think to tell us of his intentions so we could get the pictures. I want to state here that if any farmer takes this article serious enough to start action, I would appreciate very much a notice of it, so as to get pictures that might be used to suggest to others.

There are a good many attractive country homes in
Boulder county, but the thing that always puzzles me is that, with their neighbors having such homes, why some farmers are content with the unsightly surroundings of their own homes.

The accompanying picture illustrates that only in the country can a real home be built, where there is plenty of room for trees to develop, and where other houses are not crowded so close as to lose the setting. This shows the farm home of Mr. Albert Lund, living 5½ miles south of Longmont.

After I promised to write this article, there appeared in the college news notes a short article on the same subject by Professor Longyear and as he expresses it so concisely, I offer here his article, and hope that every farmer who reads it will at least give some thought to this and, whether you care or not, at least give the women a chance to live happy in a pleasant home:

"It must be confessed that the same query has lain, unvoiced, in this plain way, for a long time in our own mind. It certainly expresses very frankly a condition which prevails all too commonly among our rural habitations. The answer involves several reasons among which are probably lack of interest in and appreciation of attractive home surroundings, lack of time to give to 'fixing up' around the place, lack of knowledge as to how the home surroundings can be made attractive without great expense, and because the owner, himself, lives in town.

"Rural homes are to be found occasionally, however, which show a commendable pride and the enterprise on the part of the inhabitants to make an attractive place.

"When it becomes more generally known how much
may be done by the judicious planting of trees, shrubs and vines, and the cleaning up and proper disposal of rubbish, weeds, and discarded farm machinery, our rural homes will become not only more inviting in appearance, but will attract the best buyers when sold. It is not necessary to build an over-sized, expensive, ornate house on the farm to realize the truest home qualities. Much better results often follow the planning and carrying out of a well-designed, inexpensive planting plan, with suitable flowering plants, vines, shrubs and trees."

**WAR TIME CROP ROTATIONS**

(By I. D. O’Donnell in “Reclamation Record”)

There seems to be an inclination among farmers to forget that there is such a thing as crop rotation and to produce the crops that at this time are bringing in the most money. The production of the staple crops most needed now is the right thing to do as long as the farmer does not “kill the goose that lays the golden egg.” Soils have their limitations and the farmer must keep in mind the fact that he will have to keep right on producing food after the war is over. He should not throw his crop rotation plans so much out of gear that he will be unable to produce profitable crops under normal conditions in normal times.

Crop rotation will permit substitution of one crop for another within certain limits, but if all the principles of crop rotation are disregarded for a time the soil suffers and in the end the farmer pays the bill.

So intent have some farmers been on growing wheat that the alfalfa acreage has fallen off in some sections, and the price of hay to stock feeders has gone up so high that farmers are discouraged. Such a condition works a disadvantage eventually to the farmer, the feeder, and the country at large.

So far as is practical, produce what the country needs now, but keep in mind that you will have to help feed the country next year and the next.
Waste

J. F. Jarrell

We hear a great deal these days about waste and conservation to offset it.

In all walks of life there is enormous waste, but more especially in the business of war. It is appalling to think of the waste of our best manhood and womanhood, which will be sacrificed on the altar of war. We make this sacrifice willingly and eagerly so that future generations will have a chance to enjoy the freedom for which we are striving.

It is easy to notice the big thing. The big waste will be quickly seen and steps taken at once to stop it as soon as possible. It is the little leaks which gradually tear down and cause waste which take the profits from a business and the joy out of life. None of us want to work hard and continue to break even, although at times we are fortunate to break even. A great many men, through carelessness, ignorance and shortsightedness always play a losing game. You will hear them grumbling and saying that "the cards were stacked against us;" "there is no chance for us to win." When by careful attention to their business and a determination to succeed they could easily come out winner. Stop the leaks, prevent the waste as much as possible and utilize it when not able to prevent it.

If someone hands you a lemon, use it to advantage, make a glass of lemonade from it and forget the incident.

Waste land is what the most of us are interested in. As farmers we have acquired extravagant habits of farming.

We plow a forty-acre field for a crop and plant about thirty acres and always speak of our forty-acre crop. You will say, where are some of these waste spots? Skipped hills or rows. Too wide spacing in the rows and entirely too much room used up for turning at the ends of the rows. Too much space given to ditches. Some high spots where the water does not spread and some low spots where wa-
ter is allowed to stand and damage the crop. Ten to twenty-five per cent of most farms is waste. A great deal of this can easily be turned into profit.

The writer noticed a field of wheat last spring in which sixteen per cent of the sown area was waste. This was done by one spout of the drill being stopped up and the driver not knowing how to lap the wheel of the drill over so the drill would seed close enough to the last seeded row. In this way the field of wheat showed skipped rows. Two rows out of twelve. Suppose we should have found this field yielding thirty bushels of wheat per acre under conditions as they were. We would have had a yield of about thirty-six bushels, if the two missing rows had been seeded. Six bushels of wheat at $2.20 per bushel equals a clear loss of $13.20. This farmer had all the expense of securing a full crop, minus the seed and the threshing.

Instruct your men how to drive the drill in seeding wheat just as though you had to cultivate the crop as you do beets. If this cannot be done in any other way use a marker, similar to the one on your beet drill. The best farmers do not allow spaces in corners to lie idle or plow around a small boulder. They blow the boulder out and clean up the corners, make the ditch straighter here and there and in every way possible stop the leaks and turn the seeping waste into a golden stream of profit.

Do not become a pottering, small-detail fiend, but watch the small details carefully and the knack to do this will show you that small things make great things. You will better be able to successfully handle the big deal if you are familiar with all the small things which go to make it.

Beet Crop Conditions

The United States Department of Agriculture announces that the condition of the sugar beet crop on August 1 was 101.1 per cent, the basis of comparison being the average for the past ten years. This is a decrease of 2.1 per cent from the condition on July 1. The expected production is given as 125.5 per cent, as compared with production last year.
“Hooverizing”; a Good Investment

Alfred R. Williams

HERE is scarcely a magazine or newspaper which comes into your home these days that does not contain one or more articles on food economy. Such slogans as “Meatless days,” “A wheatless meal a week” and “Corn for wheat,” are all familiar to us. And it is well that the papers are helping to awaken the public to the need of economizing, particularly in the matter of food products. At the present time, the aid we can best give our allies in the great war is that of food supplies—vast quantities of them. To do this, we must have a large surplus; impossible unless we rigidly supervise home consumption.

But in all our economizing, is it not possible that it may lack a definite system? May there not be a spasmodic saving in one direction and a careless disregard in another? How many cases are there which could parallel one that came to the notice of the writer. A woman known to her neighbors as an intelligent woman, remarked that she “never wasted a thing, not a thing; if I have three peas left over from dinner I save them for the soup next day.” And yet this lady threw into the ash pit a sack containing fifteen pounds of sugar, because a corner of the sack had come in contact with gasoline.

It is always easy to sacrifice those things we care little for. Little credit is due the man who never smokes, when he sends tobacco to the men in the trenches, but for the fellow who thoroughly enjoys his two cigars a day, yet cuts out one and sends it to a Sammy overseas, there is a real spirit of sacrifice.

There are used in this country some 300,000,000 gallons of gasoline annually in pleasure cars. The government has
not yet taken over the control of gasoline production, but it has asked, through the Council of National Defense, that we reduce our pleasure driving one-half. Is not this a reasonable request? Surely it is shortsightedness, to say the least, for one to save a dollar during the week on food purchases, and burn up two dollars worth of gasoline and tires on Sunday in aimless joy-riding.

According to our population, we as a nation, spend more for soft drinks than any other. Is it common sense to eat bran muffins for breakfast, even though one does not enjoy them, and spend ten or fifteen cents during the day for "cokes" and sodas?

It is true that the line between luxuries and necessities is an arbitrary one and never the same for two people, or at two different periods. That young chap who does not hesitate to take a box of candy with him whenever he calls on his "lady fair," yet has no money to spare when approached by a Boy Scout on the proposition of Liberty Loan bond, has he the spirit of '76, and, what should be the spirit of '17?

The idea of economizing is not restricted by any means to our home life. It extends as well to our work and methods about the farm. Cattle feed will be scarce and high this year. It is a well established fact that in cold weather, animals require food for conversion into body heat. When an animal is without shelter from the cold and storms, the amount of food needed to make gains in weight is bound to be much greater. Will not rough shelter for stock be a good investment this winter, as well as enabling more cattle to be fattened on the same quantity of hay, oil meal and grain? Farm machinery is very expensive; will not running the old binder under shelter help make it last another season?

It is no small task in which we as a nation are engaged. Let's all pull together, exercise good judgment in our economies, and we shall all be the better for our opportunities to sacrifice.
Green Manures

Myron H. Griffin

Here are only two essentials of plant growth which must be applied to our Colorado soils if the maximum growth is to be obtained and the fertility of the land maintained from year to year. These two essentials are manure and water.

With the present high prices and possible shortage of feeds it will be difficult in many instances to secure enough manure through feeding operations for fertilizer, especially for fields which are to be planted to crops which draw heavily on the plant food in the soil.

We are so accustomed to applying manure to our fields that we are prone to believe that without it no fertilizing is possible. Can we not maintain, yes increase, the fertility of our land in other ways? Would not a leguminous crop, or some of our quick growing cereals turned under while green and succulent make an excellent fertilizer?

Crops that are grown for the purpose of being plowed under to improve the condition of the soil are termed green manures. They are of benefit to the soil in several ways: (1) by incorporating vegetable matter with the soil; (2) Leguminous crops which are most often used add nitrogen from the air to the soil; (3) Plant food from the lower soil may be brought to the surface soil.

Deep-rooted plants, like alfalfa, accumulate a large amount of nutrient from the lower depths of soil. Such a crop turned under, means that the plant food used by it and brought up from the lower depths of soil, is incorporated with the surface soil where it can be used by shallow-rooted crops, such as wheat.

Any plant may be used as a green manure to furnish organic matter, humus, to the soil. Plants which have been used for this purpose are the clovers, vetch, field peas, cow peas, soy beans, rye, beans and buckwheat. Alfalfa, clo-
vers, soy-beans, cow-peas and field peas are the principal leguminous green manuring crops in the west. The legumes have the property of taking nitrogen from the air, which is added to the soil from the decomposition of the tops and roots where the crop is plowed under. Any green manure crop should be plowed under when green and succulent.

In many instances in northern Colorado beans are grown for a cash crop and for a green manure crop also. The beans are picked green for canning, and then the green, succulent vines plowed under. This makes a splendid fertilizer and the increased yields from the following crops prove the worth of this practice.

A good practice, and one to be recommended for our conditions, is to sow rye in the fall. Rye is an inexpensive crop to seed, is very hardy, grows well on poor soil, will furnish excellent fall pasture, and can be plowed under early in the spring while green. Try green manuring!

CROP SAVERS

(By I. D. O'Donnell in "Reclamation Record")

Never a year goes by but I have proof on my own farm of the great value of birds. This year they have given a demonstration as worm eaters that has been appreciated by me most highly. Between irrigations of about 100 acres of sugar beets there were hatched out on the beets a veritable swarm of web-worms which would have quickly made serious inroads on the crop. Great numbers of blackbirds spend the summer on and in the vicinity of my farm and they quickly discovered the young worms on the beets and began a systematic extermination of the pests. Irrigation water was turned on, which added to the enjoyment of the birds, as they seemed to prefer to work where the water was running. In just a few days' time the birds had completely devoured the worst pest of web-worms I have had on my crops.

No other agency can do such work so quickly, surely, and economically as birds. Such service can not be hired or bought. We can not do too much to show our appreciation of the work of the birds.
Selection of Seed Corn

U. S. Dep't. of Agriculture

The following information regarding the selection of corn for seed is given out by the U. S. Department of Agriculture:

Seed corn should be selected from stalks standing where they grew because only then, with certainty, can seed be obtained from--

Stalks that have an inherent tendency to yield well as shown by their superiority over surrounding stalks that grew under the same conditions. (Such seed inherits high producing power.)

Stalks without suckers. (Such seed produces fewer suckers than seed from sucker-bearing stalks.)

Storm-proof stalks with ears at a desirable height.

Seed corn should be selected as soon as it matures because:

Desirable stalks, especially early maturing stalks, with hanging ears are then most easily found.

Freezing weather injures the seed before it becomes dry.

Warm, wet weather may cause kernels to sprout before drying.

If the selection is delayed in the South the ears may become infested with weevils, grain moths and their eggs.

It is as easy, more satisfactory, and much more profitable than selecting from cribs in the spring.

Care of Seed Corn.

Where corn grew wild there was a dry season in place of our winter. Each kernel contains a tender living corn plant. Upon the treatment given this plant depends the size and number of ears it will produce.

Many tests of two lots of seed alike when gathered, one promptly dried and kept dry during winter, the other cribbed, have proved that well preserved seed will yield
from a few up to 18 bushels an acre more than crib seed. In the case of the 18 bushels increase, both lots germinated equally well. The increased yield was due entirely to prompt drying and better care during winter.

Good care means early gathering, prompt drying immediately after gathering, and keeping dry and at a fairly uniform temperature. (See Farmers' Bulletin 415.)

Value of Seed Corn.

Seed corn that comes up but produces an unprofitable crop is worth less than seed that will not grow at all, because a greater amount of labor and the use of the land are lost. The seed corn that produces the best crop is the cheapest. Seed that gives an 18 bushel increase per acre is worth $20.00 to $40.00 more per bushel.

Begrudge not your neighbor $3.00 a bushel for properly selected and dried seed of a variety which has made good in the neighborhood, but refrain from paying the stranger $5.00 an ear for seed said to produce 400 bushels to the acre.

Silage from Shock Corn

C. H. Eckles

Missouri Agricultural Experiment Station

DRY corn fodder may be put into the silo any time during the fall or winter with good results, although it is better to put it in at the proper stage, according to the results obtained at the Missouri station. It is very difficult to make silage in the winter time on farms which do not have water systems which make it easy to add a ton of water to every ton of silage. It will not do to rely upon supplying the water through the cutter as only about a third enough can be added in this way. No better results are obtained if the water is poured on the top after the filling has been completed. Channels form and drain the upper portion of the silo, leaving most of the
fodder dry. There is little danger of adding too much water, but of course it makes unnecessary work.

Of ten or twelve farmers who made silage from shock corn and furnished samples for analysis, one who added apparently too little water says: "The silage was good at first, but got drier and drier toward the bottom." In a number of cases, the silage molded and, in every such case, it is found that too little water had been added. If the filling is done during wet weather, the fodder may be so damp that less need be added, but the only way to be sure of getting good results is to measure the amount of water sprayed on by the hose per minute and adjust the hose and cutter in such a way that a ton of water will be evenly distributed over every ton of dry fodder cut into silage.

The conclusions of the college derived from filling three small silos at different dates and with the addition of different amounts of water agree closely with the opinions of the farmers who had used such silage, and may be summarized by saying that (1) the feed was satisfactory and more palatable than the shock corn, (2) such silage is not equal to that made by putting in the corn at the proper stage in the fall, (3) such refilling prevents the loss in feeding value, which occurs when the fodder is left in the shock, (4) silage is more convenient than shock fodder to feed, and (5) the stalk is more completely eaten.

One of the farmers who has had experience says: "I would recommend putting shock corn in the silo any time up to February, believing it to be much more valuable as silage than when fed to cattle from the shock. I prefer putting in silo at the proper stage, however." Another farmer writes: "We filled a silo in the middle of the winter. Supplied the water with a hose in the silo. Water was taken up rapidly. Silage became very hot in twenty-four hours. The silage was in fine condition when fed. Stock ate the silage practically as well as fresh corn silage. Better to fill one silo three times than to build two or three, especially on account of the greater facility in getting help."
Ration Suggestions for California

From "Hoard's Dairyman"

We wish you would give us your idea in a general way on what feed or combinations of feed will produce the best results at following prices: Alfalfa hay, cured, $19 per ton; green alfalfa, $4 to $5; dried beet pulp, $27 to $28; cottonseed meal, $45; soy bean meal, $55; cocoanut meal, $42; bran, $45; oats, ground, $60, and oil meal, $60. At what price should corn ensilage be figured against these feeds and would it be a good feed with only alfalfa hay? G. M. B.--California.

In general the list of feeds given is highly encouraging when we have in mind the prices quoted in a great many communities in the country.

Since the soy bean meal, ground oats, and perhaps the bran seem to be considerably higher in price than the other feeds quoted when chemical analyses are taken into consideration, we would endeavor to make up feeding rations without them.

Choice alfalfa hay at $19 per ton is the cheapest feed quoted. It should be supplied the cows very liberally, making it take the place of concentrates to as great an extent as is possible. High quality silage fed in connection with it, can be made to have a value of $5 to $6 per ton, easily. This feed does not have a standard market value, but we believe this figure is not far out of the way. Alfalfa and corn silage fed in as large quantities as the cows will consume will give fairly satisfactory results in production. With high producing cows, we have always found, however, that the addition of a grain mixture is highly profitable.
Where silage is fed with alfalfa, dried beet pulp can be fed dry as a part of the grain mixture. Where silage is not fed, however, it would be wise to soak the dried beet pulp before feeding it, using about three times its weight of water and leaving it 12 to 24 hours before feeding.

With silage and alfalfa, a grain mixture of three to four hundred pounds of dried beet pulp and 100 pounds of cottonseed meal or cocoanut meal fed at the rate of one pound for every four pounds of milk produced, should give good results. Oil meal at $60 per ton is a somewhat more expensive feed. It is highly palatable, however, and may be sufficiently relished that it could replace the other meals in the concentrate mixture from time to time. It may happen that particular cows will not eat cocoanut meal or cottonseed meal readily, in which case oil meal should be supplied.

Dried beet pulp at $27 to $28 per ton is a very cheap feed, comparatively speaking. In feeding value, it closely approximates that of corn meal and, when fed dry, takes about the same place in the grain mixture. We, therefore, advise that it should be fed quite liberally.

If beet pulp is fed wet, enough of the ground oats or bran should be used with the cottonseed or cocoanut meal to lighten it somewhat, as the meal makes a rather heavy feed which may gum up in the cow's stomach. We would prefer bran to the oats because of its being considerably cheaper.

In feeding the grain mixture when beet pulp is supplied wet, the feeder should not fail to figure in the amount of beet pulp supplied as a part of the grain mixture; that is, for example, when a cow produces 25 pounds of milk per day, and is receiving 4 to 6 pounds of beet pulp (that is, that quantity of the dry feed before being soaked) not more than about two pounds of meal per day need be furnished.
Hints from a Practical Farmer

I. D. O'Donnell, Supervisor of Irrigation
From "Reclamation Record"

FALL PLOWING

The backward spring season of 1917 should serve as an object lesson for the farmer who has not heretofore made a practice of fall plowing. Last spring was certainly discouraging to the man who had to plow for all his 1917 crop, and the crop returns will be discouraging when compared with the returns from fall plowing.

Fall plowing has advantages which should not be overlooked these days of high prices and scarcity of labor.

Heavy soils for spring seeding should always be fall plowed. Such soil may be plowed more deeply in the fall than is safe in the spring; also it may be plowed when more wet or more dry than is permissible in the spring.

Trash turned under in the fall has time to rot during the winter; trash turned under in the spring may not rot and, if it does not, will seriously interfere with the movement of water in the soil and with the root development of the crop.

Soil turned up in the fall and left rough during the winter will catch and hold winter moisture. As a rule, fall plowing, through the holding of winter moisture, requires one irrigation less than does land which is spring plowed. This is an important item when labor is scarce and water is bought by the acre-foot.

Soil left rough in the fall will be firmed down during the winter and pulverized by frost action to the extent that much less work is required to put it into shape for seeding in the spring than is the case with spring plowing. Oftentimes a single harrowing will put fall plowing in shape for seeding. With spring plowing three to five opera-
tions are necessary. Winter weather on plowed soil will do from $2 to $5 worth of work per acre for the farmer.

Plowing and fitting soil is the hardest work farm horses have to do. Spring plowing comes at a time when the horses are soft from winter idleness and is responsible for many of the ills that horseflesh is heir to. Fall plowing comes at a time when the horses are hardened from summer's work and when the work may be done more leisurely than in the spring-time.

Seed will germinate more quickly and evenly on fall plowing than on spring plowing. It is particularly important on irrigated land that the seed germinate evenly and the entire seeding grow evenly; irrigation may then be timed to good advantage.

The one important disadvantage of fall plowing is that considerable roughage which might be used for stock feed may be turned under. If a farmer has live stock sufficient to utilize every item of roughage on his farm he may seriously debate turning under roughage early in the fall. In the main, however, the advantage in this connection lies with fall plowing, as the gain in production through fall plowing will more than offset the loss of the roughage plowed under.

Prepare now for next year's crops; do some fall plowing.
Big Beets from Deep Tillage

John C. Larson, Jr.

In observations of sugar beet growing, I find that cultural methods vary almost with the multiplicity of growers. Many growers have a definite method of procedure and a reason for each step taken and are ever on the alert for advanced ideas that are worth while; then a great many others simply do things as they do because they happened to start out that way in the first place. I have in mind two fields of beets lying side by side that I watched very closely; they had both produced a crop of beets the previous year and the beets had been plowed out with the same kind of a plow.

The fields were plowed, prepared and planted about the same time and in the same manner except that one field while being plowed was subsoiled by means of a subsoiler attachment that ran in the furrow behind the plow and loosened up the soil an additional 6 inches below the depth of plowing. Incidentally it might be stated that this was spring plowing as the soil in the locality is of such a nature that it runs together when fall plowed and has to be re-plowed in the spring. Four weeks after thinning, numerous samples from each field showed beets in the subsoiled field to average two inches longer than those in the other field and later in the season this increase had grown to three inches and the longer beets suffered nothing in circumference from the fact that they were deep rooted.

In another case beets were grown in adjoining fields of the same soil texture—light sandy loam with a tendency to hard-pan at the bottom of the furrow. They received the same sub-irrigation with no flooding or watering in furrows. Large well-shaped beets were raised in the field that was plowed so deep that the hard-pan was completely broken up. I measured one beet that was twenty inches
TliROUGli Tli£ LEAVES

in length and eighteen inches in circumference. Beets taken from three different fields that were plowed shallow and the subsoil was not broken gave opposite results that were quite noticeable. Apparently they were normal and well shaped, but in reality they were not. The lower part, in fact about three-eighths of them, were flat and very thin and the elongation was practically worthless for quantity or quality. Deep plowing is desirable and should always be done for growing beets.

Rules for Measuring Hay

In the measurement of hay there are two points to be considered. These are the number of cubic feet required to make one ton and the method of determining the number of cubic feet in the stack.

The following table gives the number of cubic feet required to make one ton of alfalfa at various seasons of settling, these figures being accepted as fair amounts to allow for a ton.

<table>
<thead>
<tr>
<th>Number of days in stack</th>
<th>Number of cubic feet per ton</th>
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<tbody>
<tr>
<td>30</td>
<td>560</td>
</tr>
<tr>
<td>60</td>
<td>540</td>
</tr>
<tr>
<td>90</td>
<td>512</td>
</tr>
<tr>
<td>120</td>
<td>485</td>
</tr>
<tr>
<td>Late winter</td>
<td>450</td>
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</table>

Native hay packs more closely, the usual figure being 422 cubic feet for one ton in a well settled stack.

There are three general methods of arriving at the number of cubic feet in the stack. All three methods require the width, length, and over-measurement. The latter is the distance from the ground on one side, straight over the top to the ground on the other side. Where stacks are irregular, it is best to secure a number of measurements for the width and length and the over-measurement, and use the average.

RULE I. One-fourth of the “over” multiplied by the
width, then multiplied by the length and divided by the required number of cubic feet to make one ton. This rule gives accurate figures on small, squat stacks when the width is from one-third to one-half of the "over."

Last fall the Experiment Station bought 98.55 tons by the use of this rule, and when weighed out it weighed 98.18 tons.

RULE II. (Colorado Rule) Subtract the width from the over. Multiply one-half the result by the width; multiply the product by the length; divide by the number of cubic feet required to make one ton. This rule is most accurate when the width exceeds one-half the over.

RULE III. (Government Rule) Width plus "over," divided by four and squared; then multiplied by length and divided by the number of cubic feet required to make one ton. This rule is satisfactory for large tall stacks of 25 to 45 tons, and favors the seller with ordinary small squat Colorado stacks.—T. E. Leiper, State Agricultural College, Fort Collins, Colorado.

Meteorological Report

AUGUST, 1917

<table>
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<tr>
<th>Temperatures:</th>
<th>1917</th>
<th>1916</th>
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<tr>
<td>Mean Maximum</td>
<td>83.29°</td>
<td>84.10°</td>
</tr>
<tr>
<td>Mean Minimum</td>
<td>48.29°</td>
<td>51.10°</td>
</tr>
<tr>
<td>Monthly Mean</td>
<td>65.79°</td>
<td>67.60°</td>
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<tr>
<td>Departure from Normal</td>
<td>-2.41°</td>
<td>-0.70°</td>
</tr>
<tr>
<td>Maximum</td>
<td>95.0° on 25th</td>
<td>95.0° on 2nd</td>
</tr>
<tr>
<td>Minimum</td>
<td>39.0° on 28th</td>
<td>41.0° on 31st</td>
</tr>
</tbody>
</table>

Precipitation in inches:

To Date ................... 10.07 7.23
For Month ................... 0.35 0.79
Greatest in 24 hours ...... 0.18 on 19th 0.21 on 13th
Departure from Normal —0.70 —0.28

Number of Days:

Clear ........................ 2 10
Partly Cloudy ................. 27 14
Cloudy ........................ 2 7

399
THROUGH
THE
LEAVES

NOVEMBER, 1917
Published Monthly by
THE GREAT WESTERN SUGAR CO.
Longmont Factory
Mailed Free to all our Growers
To others 10c each
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United States Food Administration
Washington, D.C.

October 22, 1917

One of the most vital problems confronting this nation is that of procuring sufficient sugar to meet the requirements of our people and of the Allied Nations fighting our common battle. The production of cane sugar in this hemisphere can and will be increased to a limited degree. But we must rely upon the farmers in sugar beet producing sections of the country for a part of the needed supply. I, therefore, earnestly appeal to every farmer, so situated, to come to his country's aid in this hour of need. Without the cooperation of the American beet grower our task will be very difficult and our ability to respond to the calls to be made upon us for this very essential commodity will be curtailed. It is at least the duty of every beet grower to maintain in 1918 his normal acreage of sugar beets. It is his privilege to increase that acreage to the extent that a well balanced production of crops will permit, and in this manner effectively demonstrate his patriotism.

Herbert Hoover.
NOTES

N. R. McCreery

THE 1918 BEET CONTRACT

We are glad to announce to our growers the beet contract for 1918. It has been a very difficult question in view of the very uncertain conditions that may exist a year from now when the crop is to be paid for. Further, the sugar manufacturers have no governmental protection in the matter of price, the maximum to which it can go having been established, but no bottom price has been set.

The Food Administrator has been urging an increased sugar supply and with sincere patriotic motives our company have gone beyond their good judgment and have agreed upon an increase of $1.75 per ton over the price being paid this year. This means that 16 per cent beets will bring you $9.00 per ton. The sliding scale contract will be continued and the minimum price or base price will be $8.37 1/3 per ton.

There is no question but the company's risk in naming this price is a real one and that a patriotic spirit has prompted their action. It is hoped that all farmers in this territory will feel the sincerity of this declaration and show that they too can respond in a patriotic manner by doing their utmost to grow the largest acreage of beets ever known, if for no other reason than that the government may have available an increased supply of sugar, which is one of the very essential commodities in the success of the war.

+++

It has certainly been a pleasure to harvest a crop of beets with weather conditions that have been so good as we have experienced up to date. The tare has been uniformly low and the test just as uniformly high. A large number of
growers are already entirely through and unless bad weather intervenes, ten days more will see our entire crop delivered. The average sugar content to date is 17.61, the highest we have had in ten years. Many growers tell us that even with a higher cost for labor and horse feed, their crop is costing far less to harvest this year than last. Also many reports are coming in of yields running much above expectations, sixteen and eighteen tons to the acre, being mentioned frequently. All of which means that the sugar beet which has done so much for Northern Colorado is trying to redeem itself for the trouble it caused many of you a year ago. Our November 15th pay day will aggregate about $1,250,000, the largest single pay day for the Longmont factory.

+ + + +

We have noticed with much regret the large number of beets left in many fields where the “Baby” beet puller has been used this year. In a number of instances we are certain the growers have lost at least a ton of beets to the acre. Either the machine is not capable of proper adjustment to meet varying soil conditions or the growers are not informed as to the method of handling the machine to get proper results. This machine has proved a very expensive digger for many growers this year.

+ + + +

In this day of food conservation and economical handling of everything that goes to make food, we are glad to see so many growers taking care of their tops. With the high prices of every other feed stuff, these tops have also an increased value. Five to seven dollars per acre is not a high price for this quantity of feed, and this is certainly well worth looking after.

+ + + +

A number of times during the past two years our Agricultural staff has been called upon to furnish a man for some of the new developments of the company. Just now we have lost Mr. John Maier, who for years has been our farm foreman and during the past year one of our field
superintendents. Mr. Maier is one of the best posted practical beet growers in Northern Colorado and we regret very much to lose him. We rejoice with him, however, in the larger position and opportunities to which he goes in the Billings district.

+++ PULP +++

There has been but little change in the pulp situation since October 1st. It looks as if the growers were generally trying a game of freeze-out on their neighbors, each hoping that enough others will not feed so the pulp allotment can be increased.

Unless there is a decided change in the situation there cannot possibly be any change in the allotment as we have figured as closely as possible our probable output.

+++ TELEGRAM +++

Thos. B. Stearns,
Federal Food Administrator for Colorado.
Denver, Colo.

Statement has appeared in Chicago papers that we have intention of reducing hog prices to $10.00. Chicago advices are absolutely untrue and do not represent opinion or proposed action of food administration, which will take no steps to jeopardize livestock producers' interests. All our powers will be used to keep prices at which allied and governmental purchases are made on a plane that gives assured return of cost and profit to producers of meat animals. In our opinion, best market obtainable for the present corn crop of country will be thru livestock.

We need increased production of beef and pork. The only way to secure this interest will be by a profit on production. Will appreciate your giving this widest publicity.

(Signed) HOOVER, Food Administrator.
The Immediate Future

H. Scilley, Manager of Loveland Factory

It is conceded by everyone that the patriotism of the country will be fully tested before the war is ended, and the majority of the people are, I think, working with the government in every way possible to conserve the food supply, increase the production, and avoid speculation that will increase the price of staples.

The housewives have filled their cans with vegetables, cultivated their own kitchen gardens and put up enough fruit for family use; and are in other ways trying to conform to the government’s request for conservation.

We have heard that there was likely to be a shortage of wheat, meats and grains; but until lately we have not heard much about shortage of sugar. The government has set a price which the manufacturers are conforming to, but little has been done to stimulate production; and the price set for sugar makes it impossible for the manufacturers to pay the farmers as much as they (the farmers) think they ought to have for beets, in competition with other crops.

Here are some of the things that readers of "Through the Leaves" should give serious consideration. We have a limited territory in the United States where sugar beets can be grown and where factories are located to manufacture sugar.

Wheat or grain can be grown in any state in the union.

If the country needs sugar worse than wheat, are we justified in using the land that should be in beets on which to grow wheat?

If you grow beets under the contracts offered and the war should be settled this next spring, you know the sugar company will come through and pay what they have promised.

If peace is declared have you any contract that will hold up the price of wheat?

It is true the beet crop requires more laborers, and may
cause a little more worry, but the burden of getting the laborers has always fallen on the sugar company and they have spent a great deal of money in bringing labor into the country, which has not only handled the beet crop, but has handled the greater part of the other crops grown.

This company is offering a contract which is the limit of what it can afford to pay in order to encourage a maximum production of sugar. Can the farmer afford to be less patriotic in helping meet his country's needs?

If, under present conditions there is a sugar famine, and half the country practically out of sugar, what will it be next year, if land that should be planted to beets is put to other crops?

Another point I would like to call attention to is the arranging of the school year, by districts in which beets are grown, so that the law will be complied with and laborers have the use of their children during the month of October. The plan tried at Greeley, when school was conducted in August, and the children allowed to be out in October, has, I understand, worked well, and under present conditions this plan should be extended by all boards of education affected.

Some of the laws placed on our statute books for peace times are working a hardship under present conditions, especially the law that will not permit women to work more than eight hours at a beet dump. The weighing is pleasant work for women, where they can make good wages, and not in any way be hurtful to them; but under the present law they cannot be employed more than eight hours, and as the dumps have to be kept open ten hours it necessitates employing men instead. The Sugar company is not advocating the working of women or children when it is not necessary, but I am simply calling attention to some things that have worked a hardship on deserving people.

Capital and labor will have to pull together to win this war, and each one will have to assume their full proportion of the load, if it is to be speedily brought to a successful issue.
The Delivery and the Receiving of
the Beet Crop

Chas. Snow

ONCE heard a man say that he thought it a good plan to kick once in a while, even though he had no kick coming, just to keep the other fellow from thinking you were easy to please. Now I think on the beet deal there is plenty of ground for kick on both sides.

First, take the grower’s part of the deal. Let every grower deliver his beets in as nearly perfect condition as he can, (and all of us can do better than we have done). The Sugar company has been paying for tons and tons of dirt and rocks that could be left in the field by taking a few more minutes’ time in loading. Of course, when one is unloading in the piles at the dump he will throw out more dirt than when going over the dump, but the extra dirt sold could be cut to a minimum by a little more care. Too many growers seem to think that they get the small end of the deal anyway and they have to unload dirt to get even.

From my own experience I believe the Sugar company lives up to the letter of the contract for the delivery of beets better than the grower.

For the grower’s part of the kick, I think the Sugar company should provide better roads and approaches to the scale and dumps than can be found at most of the stations; also a decent scale house and coal supply for the ladies who weigh for them. Last year our weigh lady had to sit in the scale house without fire because the boys couldn’t “mooch” enough coal from the freight train to keep up fires. I realize that it is hard to get a crew of men for any of the dumps that would suit everyone, yet I think if the field men would look closer into complaints they would find the farmer is justified sometimes in bouncing a beet over some of the crew now and then.

However, let’s not kick too much, but both sides live strictly up to the contract.
ARMERS may be divided into two types: The first is the man who plows his land, plants, reaps and sells his crop, pocketing the proceeds, only to repeat the process again and again. Each year as his crop gets finer, his proceeds diminish until he finally sells and moves on, only to get another place and start robbing it. This type can usually be found occupying his time at this season of year burning the straw stacks, and always manages to put the manure in some ravine where the best part of the fertilizing contents are washed away.

The other type is the man who makes a home on the farm, feeling that he expects to stay there and hoping that his son will be there after him. He conserves the fertility and endeavors to increase it by marketing a certain portion of the crop through live stock, putting the manure where it will do the most good and keeping his crop well balanced by a good system of rotating. He watches eagerly each year the fields to see how they have responded to this or that treatment. This man never burns straw stacks.

Burning straw stacks is a practice that naturally went with the earlier days of agriculture when sales were richer and prices so low that skimming the cream seemed the logical thing to do. Our present agricultural methods class it as extremely wasteful, and with feeds, live stock and produce as high in price as they are now, it would seem almost criminal. While each year sees fewer stack fires in this section, still there are hundreds of dollars burned up in straw where there should be none.

Experiments show that straw makes a valuable stock feed when used in the right way. While it is poor in crude protein and fat, and runs rather high in woody fibre and cellulose, it should be fed sparingly to horses at work, fattening cattle or cows giving large quantities of milk. On the other hand it mixes very well with other feeds for
carrying idle stock through the winter, and used in moderate quantities will very much reduce the cost. At the Indiana station, oat straw proved as satisfactory as clover hay for wintering stockers that had in addition, silage, shelled corn, and cotton seed meal. In two trials, while the steers ate but little straw, it seemed to satisfy their desire for dry roughage and made as large gains at less cost for feed, and sold for fully as much as those fed clover hay.

Another test that was carried on in western Kansas where 100 yearling heifers were wintered on four different rations, each one containing 10 lbs. of silage, 2.6 lbs. of straw, and either Kafir stover, sorghum stover, Sudan hay or alfalfa hay, the gains were satisfactory to put them into condition to make good use of pasture next summer, and were made at a surprisingly low cost. Still another trial at the Tennessee station, demonstrated that straw (half oat and half wheat) was superior to cotton seed hulls (which is largely used for feed) where fed with 1 to 2 lbs. cotton seed meal; and also gave better results than silage alone.

A ration of 16.7 pounds corn silage, 9.6 pounds oat straw, and 3.5 pounds clover hay put on over 1 pound a day gain on beef steers at the Illinois station.

These trials show the possibilities in beef production of utilizing good straw and saving the hay. Oat straw is the most nutritious, followed by barley, wheat and rye; and spring wheat is of more value than that of the stiffer winter wheat. Naturally as the straw is low in protein and high in crude fibre it must be fed with feeds that will balance it, such as silage and cottonseed meal or beet pulp. The department of agriculture recommends the following as illustrations of how straw may be used for wintering beef stuff:

(1) Straw 10 lbs.; Silage 20 lbs.; Cottonseed meal 1 ½ lbs.
(2) Straw 20 lbs.; Cottonseed Cake 2 lbs.
(3) Straw 10 lbs.; Shock corn 10 lbs.; Cottonseed meal 1 lb.

Beet pulp or tops could replace the silage in ration 1,
and alfalfa could be added to any one, simply using straw to replace a portion of the alfalfa. Straw and silage could be used alone for wintering stuff or if where alfalfa hay is fed a portion could be replaced with straw with practically as good results. If you cannot use all the straw for bedding or for feeding, plow it under. The fertility elements in a ton of straw are variously valued at from three dollars to five dollars. By proper handling the greater portion of this can be saved. No straw should be burned this fall. Use a little more in bedding, feed all that is possible, and put the rest back on the land.

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**Hints From a Practical Farmer**

I. D. O'Donnell, Supervisor of Irrigation

From "Reclamation Record"

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We have heard the old query: "If a frog in a 20-foot well climbs up 4 feet each day and slips back 3 feet each night, how long will it take him to get out? Many a farmer is up against the same question in producing live stock. If, through the use of plenty of grass and other succulent feeds he makes a cow weigh 1,000 lbs. in the fall and she shrinks back to 800 lbs. in the spring, how much does he realize on what the cow eats? A little thinking along this line will induce the wise farmer to stop up the cracks in his barns and sheds, to haul in plenty of straw for bedding, and make sure of a good supply of roughage and other feeds necessary to hold on the stock the flesh they have gained during the summer months.

Every pound of animal flesh is worth its market price at the close of the grass season and if any of this flesh is lost during the winter it must be charged to the loss account and the animal started out again in the spring in a weakened condition.

Hold your stock in good condition during the winter.
Fall Plowing

E. H. Huelskemper

ALL plowing is very often a disagreeable topic when the weather late in the season is wet, the soil frozen or conditions are otherwise unfavorable for field work. However, the importance of fall plowing should not be overlooked. In the spring it does no good to wish that more plowing had been done before “things froze up” for the winter. This fall especially, when the beets will be out of the ground early, advantage should be taken of the opportunity to do some fall plowing. The teams will be hardened from their work with the beets and the weather will be cool so that all which is lacking to make pleasure of plowing are good implements to work with and ground fit to be plowed.

Many fields are too dry to plow, but this can hardly be offered as a good excuse for not plowing in a great many cases. In most ditches there is still some water available for irrigating at least a few acres. To wait for a storm to soften up the ground is foolish as it may come too late, also when it does come it may not stop long enough for the soil to dry out properly for plowing before another storm, or perhaps hard freezing weather comes. To plow some of the fields as dry as they are may also be foolish as many large, hard clods will be turned up, which, in case only a small amount of moisture comes during the winter, will be hard to get into shape for a good seed bed next spring. But, if the ground is not plowed and the same conditions exist during the winter, that is, not much moisture falling, practically the same state of affairs will exist next spring; the ground will turn up hard and lumpy and just as much work will be necessary to get it into shape for seeding. Besides, in spring the teams will be soft from lack of hard work.
during the winter and, if hired help must be depended on
to do the plowing, that may be even scarcer next spring
than it is now.

Plowing in fall has many advantages besides the satisfac-
tion of knowing in spring that the work has been done.
The loosened condition of the soil makes it possible for
more moisture to be held in it. If rain and snow falls the
water can be taken care of by the loosened earth. If no
moisture from rains or snows is added then that which is
already in the soil will be held there better by the loosened
earth than it could be by the unbroken top surface. Soil
loosened by plowing gets the full benefit of the fall and
winter sunshine and gives Jack Frost a better chance at
many of the bugs and their eggs which may be in the
ground, and to weather down the new soil which is turned
up. Also, in stubble ground the stubble rots faster under
ground than it does standing up above ground.

Disking before plowing, whether it be spring or fall
plowing is always advisable. It allows the top soil to set-
tle back into closer contact with the moist subsoil than if
large lumps, which may be the cause of air pockets
forming, are turned under by the plow. It’s a good prac-
tice but not generally followed. It helps to make a fine
seed bed, saves moisture, makes plowing easier and in-
creases the crops. What more does one want?

Disking or harrowing each half days plowing before
leaving the field is another practice which should always
be followed. Those lumps, if not already too hard and
dry to be broken by the disk, will not have a chance to
dry out over winter and stick up like monuments to a
neglected operation next spring. If the disk doesn’t
break them it may force them down a little so that they
will be easier “melted” than if allowed to dry out all win-
ter. It is unsafe in most cases not to use the disk after
plowing and there is seldom any danger in using it so no
more argument is needed for the use of the disk. In ex-
ceptional cases, of which every farmer who has to deal
with them, knows best, fall plowing may not be the right
thing, but in the majority of cases fall plowing is the best
practice.
Is the Auto Paying Its Share to Maintain Good Roads?

J. F. Jarrell

If there is any one thing on earth which tends to put a grouch on everyone it is bad roads. The roads of northern Colorado as a rule have the reputation of being good. The important thing for us is to see that they are kept good. On a trip from Longmont through Loveland, Windsor, Greeley, LaSalle, Platteville and return to Longmont, the writer at times bore a grouch almost past endurance. The road was literally up in the air, making it exceedingly difficult for an autoist to appreciate its good qualities. Then, when the road finally settled down to the earth's surface once more, it was widely scattered from the roadway, mostly over in the fields or “over the hills and far away.”

The writer on this trip breathed a cubic foot, more or less, of what should have been roadbed; in fact, it should have been good road bed but it was not, because it was not where it belonged. It seems that after spending large sums of money to put a good road bed where we want it, it is foolish to permit it to be pulverized and lifted into the air to be drifted to parts unknown.

All vehicles, of course, help to pulverize the road surface, but for lifting and scattering it in all directions, the automobile is Champion. You will say that “if the automobile did not lift and scatter the road dust, the wind would.” It undoubtedly would to a certain extent but nothing like to the extent that both automobiles and winds do.

We cannot do away with the winds simply because we wish to run automobiles, nor can we do away with the automobiles because the winds blow. Common sense seems to whisper “some sort of binder is needed to keep the roads in their place.” The writer does not claim to
be a road expert, nor has he any guaranteed road binder for sale. Money is the first requirement regardless of what method or process is used to make and maintain good roads. It is apparent that not enough money is coming in through the channels already in operation, to meet the requirements of our road upkeep, saying nothing about building new roads where they are needed.

There is no board of equalization when it comes to road taxes. We need to know exactly who uses a road and how much he damages it in order to safely assess the public for the upkeep.

The old system of toll-gates in use in some sections of the eastern part of the United States appeals to me as the only just way to distribute the expense of road upkeep. There the man who travels the road pays for its upkeep and in order to have the road well kept he digs well into his pocket to pay for it. The man who kicks up the most dust should be the man who kicks through with the most “dust” to replace the road bed.

The automobile has been the cause of the construction of many hundreds of miles of good roads; now let’s try and see that they bear their portion of the expense of maintaining these roads. The original cost of a road becomes a small item after a while, unless proper precautions are taken to maintain it.

All fair minded people are willing to pay for what they get or for what damage they do, but in this case of the roads, I believe not one person in one thousand knows either what value the good road is to him or what damage he does to it in passing over it.

It is not difficult to figure the cost when some one breaks a bridge through carelessness, nor is it difficult to collect damages in such a case. This is true because we know the exact cost of the bridge and can collect the damages and construct another one. We do not know the cost of our roads and their upkeep well enough to keep them good. For this condition we are “indebted” to politics and some other nonsensical stuff which the road users
are forced to endure, whether they bear their share of the expense or not.

The writer has no desire to see the autoist imposed upon for road up-keep, but he does have a desire to see that the roads are well kept and to do this adequately more money is needed and it is only making the one pay who receives the benefit.

We will never get rid of the road question in some form or other until we take to the air for travel, as that time seems to be far in the future, let's do all we can to make and maintain good roads.

**Mud--As Walt Mason Sees It**

SPRING brings the wet and helpful rains, the cloudburst and the flood; and then the broad and fertile plains are plastered thick with mud. We journey forth from our abodes in wagons, boat or cart, and we get stuck in muddy roads, which breaks the human heart. We spend about $10,000,000 bucks each year to fix the pike and in the springtime only ducks along the same can hike. The farmer stays away from town and doesn't blow his scads, so we find commerce sagging down in all our western grads. The autos are no longer run, dead are their wonted fires; so worthy dealers take no mon for gasoline or tires. All trade in grim stagnation stands; 'tis this way everywhere; and merchant princes wring their hands and rend their robes and swear. The roads are just long streaks of mud, a warning and a fright, and with the old accustomed thud the mules sink out of sight. We spend some $40,000,000 bones each year to fix the pike; go forth, I say, in thunder tones, and see what they are like. Go forth when tides are ebbing low, survey the dismal scene, and if you're wise when forth you go you'll use a submarine.—From "The Highway Magazine."
From Field to Dump
Food Conservation

H. Mendelson

Our Food Administrator, Mr. Hoover, says:

“The supplies in the World’s larder for the next twelve months are now known. They are too short to support our Allies unless every man, woman and child enter National service to support the Food Administration.”

France, England, Ireland, Italy and Belgium, owing to the reduction in harvest, must, during the next twelve months, import sixty per cent of their wheat requirements.

We must furnish, this year, twenty-two per cent or about two hundred and twenty million bushels of wheat against our surplus in this year of short crops of only eighty-eight million if we eat normally.

If we reduce our wheat flour consumption from five pounds per week per person to four pounds we shall make available our quota.

The production of meat, fats and sugar is also deficient in those countries, and we have to supply it.

“Therefore, we have two clear duties—first, to substitute other commodities we have in abundance for those we can ship; second, to eliminate every waste. If, in this way, we can reduce our average consumption per person one pound of wheat flour, two ounces of fat, seven ounces of sugar and seven ounces of meat per week, and if we use our milk and butter carefully and without waste, we can maintain our own people on a full diet and can still supply the deficiency in our Allies’ food, for when these apparently small savings are multiplied by one hundred million every week, they assume gigantic proportions and offer a complete solution of our problem.”

It is hard for any individual to realize the seriousness of the problem. It is still harder to do persistently and every day what is required of us.
It always has been easier to find a million men willing to sacrifice their lives than to find an equal number willing to quit smoking for a week.

A change of long practiced habits, particularly those referring to the daily diet, is very annoying. A few practical suggestions can be easily adopted.

Eat more cornmeal mush and oatmeal, even if cornmeal at present costs more than wheat flour. Use milk instead of cream with them.

If you eat jam and jelly with your bread, don’t use any butter with it.

Don’t feed your children on candy and chocolates. Jam and jellies are more wholesome and contain all the sugar children need.

Use gravy over your potatoes instead of butter, and have plenty of potatoes. This is one crop we have a surplus of.

Eat fish at least once a week, even if fish costs more per pound than beef.

Use more beans, peas and cheese. They can well replace part of the meat.

There are good substitutes on the market for lard for frying purposes just as nourishing and cheaper. These are purified cotton seed oil and oil made from the germ of corn.

Peanut butter is one of the cheapest foods on the market.

More important than any detail is that you make up your mind sincerely to do something and then do it, no matter how small it may appear.

From all belligerent countries the complaint comes that the farmers have not done their share of the necessary economizing of food consumption.

Farmers as a class have vastly profited by the war in this country.

The sacrifice asked is small.

Most of us city fellows are forced to economize by the high price of everything.

The farmer, surrounded by a surplus of food, is, of course, more tempted than we are.

Two dollars for wheat, and nine dollars for beets, however, are some consolation for a little sacrifice.
Dairy Stock of Stanley Bixler, Boulder Valley
The Importance of Livestock on the Farm

B. Youngblood
From “The Agricultural Review”

The farmer should be a business man and farming should be considered a business enterprise and not merely a means of subsistence. The farm should be developed and directed so as to yield a fair reward for one’s skill and executive ability. Efficiency should be the first thought. The farm should not merely be made to produce such profits as are profitable or desirable, but it should be made to produce them in such a manner that they may be produced at less expense and in greater abundance another year.

We find examples in abundance of early day farming which promised success and brought failure in the end. Grain and cotton farming are notable examples. Both types impoverish the soil. In grain farming a drouth during the period in which the grain matures brings disaster, for it is not forage, but salable grain upon which the farmer depends for his money. The cotton farmer faces a similar situation. He must not only produce stalks, but bolls of cotton, as it is the seed and lint upon which he depends for a living. There would be no economic objections to the outright sale of crops if crops were “just crops,” but crops are not “just crops,” they are crops plus an appreciable amount of the original plant food elements in the soil. In hauling these elements off and selling them one is not only selling the products of his labor, but also he is selling an intrinsic part of his farm which he has no right to sell, namely, the producing power of the soil.

Profitable farming is clearly dependent upon provisions for the maintenance of a high state of soil fertility and the cheapness of the method whereby this is accomplished.
In many sections of the country, where it was found that the soil has become unproductive through continuous cropping an effort was made to continue the same crops by the application of commercial fertilizers. This was but temporary relief and did not solve the problem. The cheapest source of plant food is livestock. The manure of livestock not only contains plant food, but organic matter which should, as a rule, be applied along with the commercial fertilizers. Many soils, as the black lands of Texas, fail to respond to applications of commercial fertilizers, but do respond very satisfactorily to applications of barnyard manure. The most practical means of stopping the selling of soil fertility through crops is to grow or buy livestock, feed or finish it on the farm, and return the manure to the soil.

The foregoing is suggestive of the fundamental importance of a specially arranged cropping system for the farm. Without this, neither manure or commercial fertilizers can be made to produce best results. If, in accordance with the modern order of things, it is wise to sell a given crop, as for instance, cotton or wheat, then a sufficient number of animals should be kept and finished to supply manure to the soil, equivalent in fertilizing value to the plant food taken out of the soil for the crop sold. Many of us are inclined to condemn the man who buys feeding stuffs but the standpoint of permanency considered, the wise farmer keeps sufficient livestock that he will be compelled to buy feeding stuffs rather than have a surplus for sale. Again we no longer think of feeding cotton seed on the farm for in doing so we would be wasting a crop of oil worth from $5.00 to $7.50 per acre, figuring that the yield of cotton will vary from one-third to one-half bale to the acre. A ton of cotton seed will yield 40 gallons of oil worth 75 cents a gallon at the present time. Instead of feeding the cotton seed on the farm we sell it to the oil mills and buy back the cotton seed meal. For a similar reason wheat is sold and the bran bought back for feed. Even under a system of stock farming it may be necessary
to buy some commercial fertilizers, particularly phosphoric acid, but the point is, this expense will be reduced to a minimum under a proper system of stock farming, whereas much of the so-called profits of crop farming is dissipated in having to buy back the plant food sold in the crop, at a higher price. By livestock farming, for the purpose of this paper, we mean farming wherein livestock is maintained in sufficient number to supply the farm with manure. It may include farms whereupon certain money crops, which fit well into the rotations, are grown.

While the matter of maintaining soil fertility is a primary reason for including livestock in our farming operations, there are other reasons also worthy of consideration. We not only get plant food cheaper, but under present conditions we actually get a better price for the crops fed than would be the case if the same crops were sold. Otherwise it would not be profitable to feed cows and sell milk, to feed steers and sell beef, to feed lambs and sell mutton, to feed chickens and sell eggs, etc. When this is not the case there is something wrong with the market for animals and animal products. On a well-ordered stock farm where necessarily a number of crops are grown, we find not only a better balanced ration for the plants and livestock, but for the family as well.

The matter of properly feeding people is really of more importance than that of feeding plants or livestock. Not only is a meal which may be produced at home on the stock farm better balanced, but it is more palatable and generally more healthful. Certainly we may expect people so nourished to be hardier and better capable of performing their various duties of life than those that are improperly nourished for lack of a proper ration.

Then again is the matter of association with livestock. Any boy reared away from livestock has missed a fundamental part of his general education. Every boy and girl are naturally admirers of livestock and should learn their habits and their needs by growing up with them. Livestock farming, therefore, is not only the key to the problem of
a permanent agriculture, but is the type of farming that is most conducive to health and happiness in the country.

The question may be asked: "How about the farmer who insists on growing crops instead of livestock for a living?" The answer is, those men—truck farmers, fruit growers, etc.—who find it profitable to grow crops alone, have access to a cheap source of manure or other plant food which really should have been kept on the other fellow's farm, or which would otherwise go to waste in and around the cities. Another type of crop farmer is the man who grows feeding stuffs, but is unable, for the time being, to keep livestock. On the other hand, there is the ranchman who produces feeders in range country, where crop production is not possible.

In the south, especially, an immense waste of plant food has resulted from commercial feeding around the oil mills and packing houses. The margin of profits in finishing livestock has become so narrow that it is no longer an absolute safe business for the commercial feeder. It is a much safer enterprise for the small farmer who usually has a lot of stubble which makes good grazing and lessens the cost of finishing. He can feed on his field and must secure the benefits of all the manure, both liquid and solid, derived from the feeders. Objections may be made that finishing is a business unto itself, and that it is dangerous for the farmer to engage in a business in which he has had no experience. These things may be true, but it must be remembered that the farmers throughout the country are now doing many things very successfully which only a few years ago they were unable to accomplish. This change in the ability of the farmer has been brought about largely through the guidance of the state agricultural experiment stations and the demonstration agents. If the farmer is entitled to this guidance in the matter of crop production he is equally entitled to similar guidance in the matter of livestock production. In many places the demonstration agent is already rendering this service in a most satisfactory manner, and all that is left
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to be done is for the state and federal agencies to extend the work to every section. The crop farmer is busiest during the spring and summer months, during the late fall and winter months he and his equipment are usually out of productive employment, the finishing of livestock during these months would fill in the void and make his farm a more profitable and more interesting proposition.

Livestock is especially efficient in converting materials which would ordinarily go to waste, into valuable products. Poultry, for instance, convert grasses, insects and wasted grain into eggs and meat. Sheep convert grass and weeds into mutton and wool and at the same time make better pastures for other livestock. Angora goats on the farm are most efficient animals; they convert brush and weeds into mohair and meat, and if enough of them are kept to the acre, they will clean the land and kill the stumps. The dairy cow is especially efficient as a manufacturer of human food and there is room for her on every farm and ranch in the country.

Not only is stock farming best for the farm and for the farmer and his family, but it is favored by American conditions and ideals. Our climatic conditions are such that the ultra intensive farming of the orient is hardly possible, and our ideals are such that we prefer a less intensive population and a high standard of living to an intensive population with its low standard of living.

The human being is naturally omniverous, and will continue to eat meat with his bread as long as he can. No one substitutes beans for meat except in cases of necessity. Any man able to do so is going to pay the price for milk and butter, poultry and eggs, fresh and cured meats and such is the prosperity of this country that, the proper relation of things maintained, no man will go very long without them. As long as this is the case, stock farming will continue to be, not one of the most popular, but one of the most profitable types of farming which a man can follow.
Stop Tremendous Manure Waste

Carl Vrooman, Asst. Secretary of Agriculture
From "Reclamation Record"

ONE-HALF the manure produced in the United States is not used as a fertilizer, there being an annual loss of material worth $1,200,000,000. Once and a half the value of the country's 1916 wheat crop.

This is not a wild guess, but a very shrewd and conservative estimate based on reliable statistics. It has been found that each horse or mule produces annually $27.00 worth of manure (as compared with commercial fertilizers); each head of cattle $20.00 worth; each hog $8.00 worth. Calculating from the 1910 census figures for number of animals on farms, 62,000,000 cattle, 24,000,000 horses and mules, 58,000,000 swine and 54,500,000 sheep and goats, the total value of the manure produced is found to be about $2,461,000,000. Recent investigations by the Department of Agriculture indicate that at least half of this great wealth of fertilizing material is sheer waste. In some good general farming sections not more than 15% of the manure produced is used. Even in the most intensive dairy regions, where cows are largely stall fed, and comparatively great care taken with the manure, the loss seems to be approximately 25%.

Here then is a job for the American farmer worthy of his utmost effort and in keeping with the spirit of this great hour in American history. To save a billion dollars worth of manure is a Herculean task, a veritable latter day Aegean stable job for it means a handling of literally millions of tons of dung and litter. It means the construction of concrete manure pits, of paved feeding pens, or sheds, and greatly increased care in the conservation and use of bedding material. It means a lot of work, but it is work that can be done at odd hours and moments. A
to be done is for the state and federal agencies to extend the work to every section. The crop farmer is busiest during the spring and summer months, during the late fall and winter months he and his equipment are usually out of productive employment, the finishing of livestock during these months would fill in the void and make his farm a more profitable and more interesting proposition.

Livestock is especially efficient in converting materials which would ordinarily go to waste, into valuable products. Poultry, for instance, convert grasses, insects and wasted grain into eggs and meat. Sheep convert grass and weeds into mutton and wool and at the same time make better pastures for other livestock. Angora goats on the farm are most efficient animals; they convert brush and weeds into mohair and meat, and if enough of them are kept to the acre, they will clean the land and kill the stumps. The dairy cow is especially efficient as a manufacturer of human food and there is room for her on every farm and ranch in the country.

Not only is stock farming best for the farm and for the farmer and his family, but it is favored by American conditions and ideals. Our climatic conditions are such that the ultra intensive farming of the orient is hardly possible, and our ideals are such that we prefer a less intensive population and a high standard of living to an intensive population with its low standard of living.

The human being is naturally omniverous, and will continue to eat meat with his bread as long as he can. No one substitutes beans for meat except in cases of necessity. Any man able to do so is going to pay the price for milk and butter, poultry and eggs, fresh and cured meats and such is the prosperity of this country that, the proper relation of things maintained, no man will go very long without them. As long as this is the case, stock farming will continue to be, not one of the most popular, but one of the most profitable types of farming which a man can follow.
Stop Tremendous Manure Waste

Carl Vrooman, Asst. Secretary of Agriculture
From "Reclamation Record"

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work that will pay tremendous dividends, not only as a war measure, but conceivably for all time, for if we once get the habit of making full use of our available manure supply we are not likely to lapse into the old wasteful ways again.

The cheapest and best way to handle manure, where convenient, is to haul it to the field and spread it daily, or at least every two or three days. In this way, if plenty of bedding is used, practically all the valuable constituents of the manure are saved, since leaching after the manure is on arable land merely serves to put the fertilizing materials where they ought to be. In this way, too, loss through heating or “fire-fanging” is avoided.

Many farmers, however, are not so situated as to make it profitable for them to handle the manure in this way, for such farmers the concrete manure pit offers an ideal way of saving manure. Such a pit need not entail great expense. A pit three feet deep, twelve feet long, and six feet wide with walls and floors five inches thick will serve the needs of the average farm. In ground that does not cave in, only an inside form will be needed for such a pit, except where the concrete extends a few inches above the ground to prevent flooding by surface water. The floor should be reinforced by woven-wire fencing, put in after about two inches of cement have been laid, the section of fencing being cut long enough to bend up a few inches at either end into the side walls. When the reinforcing has been put in the remaining three inches of the floor are laid and the forms for the side walls set up and used immediately. Use one part cement, two of sand and four of screened gravel. A pit of this kind is large enough to hold the accumulation of manure on the average farm until such time as it can be hauled conveniently to the field and spread.

Another way to save manure, especially in the case of hogs or beef cattle, is to have a concrete paved feed lot, preferably under a shed roof. Where the farmer cannot afford a paved floor a cheap open feeding shed may be made to serve the purpose very well, if abundant bedding
is used to absorb the valuable liquid manure. In such a feeding lot or shed the manure is allowed to gather under the feet of the animals, each day's bedding being strewn over the well-trampled accumulation below. Some farmers using this system arrange their feed racks so that they can be raised from time to time, making it possible to feed till several feet of solidly packed manure have accumulated under the shed. It has been shown that manure suffers little from heating and leaching when handled in this way.

The feeding shed serves the purpose of giving the general farm, or the beef cattle farm, something of the advantage in the matter of manure saving held by the intensive dairy farm. It has been shown by farm management surveys that the manure saved on the American farm under present conditions is almost exactly proportional to the number of animals stall fed on the farm, and that the manure of animals not stabled has very little effect on yields, except in cases where field crops are "hogged off" or otherwise pastured down or where pasture is used in a rotation.

This great war has brought home to Americans, as it has never been emphasized before, the fact that we are world champion wasters. Without making comparisons and subject to correction if it can be shown that the facts are otherwise, I dare aver that our billion dollar manure waste is the world's greatest single economic waste—prize waste of the champion wastrels. With commercial fertilizers scarce, and some of them almost unobtainable, it would seem well worth our while, in this juncture, even without any reference to war conditions, to do everything within our power to stem this tide of loss, especially in consideration of the fact that stable manure is the best form of fertilizer known. And when we consider further the possible effect of a billion dollars' worth of manure upon world production at this time when the solemn duty of saving the world from famine devolves directly upon us—well, the vital need for manure pits and feeding lots in this broad land of ours becomes pretty clearly apparent.
The Farmer’s Day Has Arrived

From “American Farming”

If you are a farmer by choice you are certainly to be warmly congratulated upon your business acumen for selecting such a highly desirable avocation; and if a farmer purely by chance you should be profoundly grateful to a generous Providence for such a fortunate lot. If you are not a farmer but have an opportunity to become one, the best advice we have to offer is that you embrace that golden opportunity ere it is gone. Such, beyond doubt, is the wisdom of the times as proclaimed by all men of keen insight who have given the matter serious consideration.

For a number of years there was a steady flow of labor from the farms to city industries for the very good reason that city industries have been more profitable. But the world war and the unusual conditions it has brought about have worked a tremendous and far-reaching economic change, until farming is today the more profitable and also by far the more to be desired. This condition not only prevails now but will continue for a number of years at least, perhaps to a large degree indefinitely.

Yes, we know wages are mounting higher and higher, but as war financing continues to inflate circulation the value or purchasing power of a dollar will decrease—$5.00 a day now, with bacon near 40 cents per pound and other commodities advanced to a greater or less degree, means relatively less than did $1.50 per day when bacon retailed for 10 cents. However, the food value of a gallon of milk, a dozen eggs or a bushel of potatoes has not decreased and the old farm is just as ready to produce for you and your family a bountiful living without one particle more labor than it took ten years ago—if you have taken proper care of your land.

On the other hand the advance in the prices of what you have to sell (or what you should sell) has retained a satisfactory relation to the price of the things you have to
Verily, the day of the farmer has arrived. His star is in the ascendancy. He is the foremost citizen of the land, the one altogether indispensable factor. Rejoice in your good fortune, brother farmer, and continue to make the most of your opportunities to be a true patriot and do good to all men.

Feeding Sugar Beets

From "Field and Farm"

E of Colorado who make a study of the sugar beet business know that from twenty-five to twenty-eight tons of the roots can be grown, and even more in some instances. We have also learned that the beets are very desirable stock food. It does not require nearly so much labor and expense to grow an acre of beets for stock as it does to grow an acre of beets intended for the sugar factory. In order to grow beets for factory purposes certain results must be obtained in the constituent elements of the beets. In the first place, they must be high in sugar and low in certain salts, known as impurities. Everything depends upon the quality and purity of the beets. These qualities are not required in the case of the larger or stock beets. Sugar beets must be held down to a certain maximum in weight in order to get the quality and purity. This is not true of the stock beets; hence, the farmer can produce considerably higher tonnage when growing simply for stock. Sugar beets are a profitable crop to raise for feeding along with grains and other stronger foods. By experience any farmer realizes at once the value, quality, and cheapness of sugar beets grown for stock. The farmer not only realizes the advantages of raising a crop of beets, but he also becomes more familiar with the habits of the plants and the general nature of the crop itself. We have always urged that a general production of sugar beets for stock purposes would be beneficial to any com-
munity, and where a factory is likely to be established such production tends to educate the community in regard to the germination, cultivation and harvesting of the crop. In such case the factory is not required to begin, as is usual, with everybody in ignorance of the requirements. We wish to insist on the desirability of raising sugar beets for stock food under all circumstances, but of course there is less necessity for growing them for stock in a locality where a sugar factory is in operation. Sugar beets and sugar beet pulp have about the same value, ton for ton, for feeding purposes. The farmer who takes a ton of beets to the factory and brings back a ton of pulp has really returned about as much feeding value as was in the beets he delivered; and, while he obtains only one-half as many tons of pulp as he delivers tons of beets to the factory, it only costs him about one-fifth to one-third of what it would cost to grow the beets producing the pulp. When he delivers beets to the factory and takes home the pulp he has left most of the sugar and considerable of the water and salts which the beets contained at the factory, the bulk of the original elements making up the feeding qualities of the beets being still in the pulp. Sugar is not to be classed as one of the valuable feeding qualities of the beet. Sugar is made up of oxygen and carbon, or, as a famous chemist used to express it, “The sugar in the beet is composed of air, sunshine and water.” Practically the sugar in the beet comes from the air, while the main feeding qualities of the beet come from the soil. Thus the farmer can readily see that, if there is a sugar factory where he can get pulp, it is much cheaper and better in every way to procure pulp than to grow sugar beets for feeding purposes. He can grow beets and sell the sugar out of them to the factory, and still have left the greater part of the feeding qualities of the original beets at a comparatively small cost. This, then, should be the rule: The farmer who is not near a sugar factory should grow sugar beets for stock food, because they are cheap, valuable and healthy food for animals; the farmer who lives in the right locality should grow beets for the factory.
OME farmers who a few months ago clamored for a guaranteed price of wheat are now complaining because the Food Administration has taken the speculative feature out of the wheat market, forcing them to sell their wheat on a $2.20 basis, instead of at the price of more than $3.00 prevailing prior to federal supervision. It is but natural that they should have desired the higher price to prevail until after they had marketed their wheat, but it must be remembered that the grain gamblers never have allowed the farmers to reap full benefit of high prices and it is not probable that they would have permitted it this year.

It is quite true that such new wheat as had been threshed before the government price was announced was moving freely without seriously affecting the market. However, there was no guarantee that such a condition would have prevailed until all the crop had been marketed. An early peace, the death of the kaiser, a revolution in Germany, the collapse of Austria or even the announcement that a means had been found of making shipping reasonably safe from submarines would have knocked the prop of competitive bidding out from under wheat, and any one of the eventualities mentioned is easily within the range of possibilities. In fact, certain importers of European goods who since February have refused to guarantee deliveries, are now taking orders and guaranteeing deliveries after January first. This would indicate that the importers believe the war will end by that time, or that the submarines will have ceased to be a serious menace to shipping before the year closes.

The world is not short of wheat but short on shipping facilities. The voyage from America to Europe is much shorter and somewhat safer than from Australia or India.
to Europe, and this accounts in large measure for the
great demand for American wheat. India has just pro-
duced a crop of 338,600,000 bushels—an increase of nearly
20 per cent over last year—and the British government is
planning to build immense silos in Australia as tempo­
rary storage for wheat it has purchased. At present there
are 3,500,000 tons (not bushels) of wheat in storage in
Australia, most of it from the 1916-17 crop. By the first
of next February this will probably be increased to 6,-
000,000 tons. Should the sea suddenly be made reason­
ably safe for shipping, wheat from this immense store
would flow freely to European markets. Under the spec­
ulative system, what then would be the price of wheat in
America?

This is one of the contingencies against which the food
administration's fixed basic price of $2.20 per bushel pro­
vides that adequate protection for the American wheat
farmer.

Meteorological Report

SEPTEMBER, 1917

Temperatures:

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The Effect of Beets on Land

J. C. Wheelon
From “Field and Farm”

Long as we are going to continue in this sugar beet business we might as well do it right. The one greatest adjunct to success is fertility. We have learned that some crops carry away from the farm to market more of the essential plant foods that go to help produce another crop than do some other crops. By selecting those which leave a residue of refuse that can be applied to the soil to give more assistance in the production of another crop of the same or any other variety, we are able to keep up the producing power of our land and by the use of manures increase its productiveness from year to year. In growing sugar beets for profit, we must avail ourselves of this proposition. No crop will produce so much money to the acre and take to market so small a proportion of the plant foods required to produce itself as that of sugar beets. I will go further and say that there is no crop that will respond to the intelligent use of the most economical processes of rebuilding the soil as that of sugar beets.

A farmer prepared a suitable field for sugar beets that has been in dry farm wheat for fifteen years. He applied five loads of barnyard manure to the acre to this land and secured water for irrigation. His first crop yielded 12½ tons to the acre. In 1914 he harvested his seventh consecutive crop of sugar beets from this land and took 22½ tons and the process is as simple as a-b-c. He plowed under all the crowns and leaves left at the beet harvest and applied the annual production of his stock in manure.
which gave him about five loads to the acre on this field. He has been a farmer all his life and was struggling under heavy interest obligations.

He has paid his debts and built a house. He firmly believes there is no crop in existence so responsive to good tillage and cheap fertilizer and at the same time returns such handsome profits as sugar beets. He plows deep and often. You cannot find any solid vegetable matter in his soil; it is all so mixed and decomposed that the only evidence of soil power is in its deep, rich, brown color showing abundant humus content. Another neighbor planted his first beet crop of thirty-eight acres on an alfalfa field thirty years old. The field was near the home buildings and a good deal of winter feeding had been done on this field.

During the season when the ground was frozen the horses and cattle were fed on the field by spreading hay on the snow. The alfalfa began to get thin on the ground; the trampling of stock for so many winters had killed the plants in many places, but the deposit of vegetable mould on the surface by the feeding and droppings of the live stock was enormous. The gradual killing of the alfalfa resulted in the decomposition of countless roots and stems. It required many plowings and diskings to make a seed bed of this old field, taking most of the previous season to prepare the ground. The first crop yielded twenty-five tons the acre; the next year the field produced thirty-five tons on the average and earned a prize for the heaviest yield on the largest field. This man is now preparing for the fifteenth consecutive crop on this field and is still growing sugar beets for profit. He has pastured off the leaves and crowns of his crop every year and has put back about six tons of barnyard manure on every acre of the land. The yield of this field has decreased gradually until last year his harvest was sixteen tons the acre.
Deadly Gas of the Silo

From "Hoard's Dairyman"

Each year the silo claims its victims. Recently several deaths of persons occurred because they entered a silo partly filled with green corn. Green corn, as soon as it is cut into the silo, starts to ferment and there is produced carbonic acid which readily divides into water and carbon dioxide. Carbon dioxide is a poisonous gas which kills almost instantly. It is commonly called carbonic acid gas, and, being heavier than air, sinks or remains on top of the green corn or at the bottom of the silo.

It is a simple matter to make the silo safe to enter when it is partly filled with green corn or any other substance used for making silage. If it is desirable to put in all doors of the silo before starting to fill it, then no one should enter the silo until the cutter has been running for a while. The entrance of the freshly cut corn into the silo stirs up the gas and it escapes over the top of the silo. If the doors are not put in faster than the silo is filled, this gas flows out as rapidly as it is formed and there is no danger in entering a silo if there is an opening not far above the level of the silage. If the openings in the silo are far enough apart to permit holding a layer of gas as deep or deeper than the height of a person, then there would be the same danger in entering a silo before the machinery starts as there is when all of the doors of the silo are put in before starting to fill it.

To make assurance doubly sure, suspend a lighted lantern by a string to the bottom of the silo before entering it and after the machinery has been running for a while. If it continues to burn at the bottom of the silo a person may enter with safety. Otherwise, beware. It means death to enter a silo which contains carbonic acid gas.
Agriculture is a science, but not an exact science, as chemistry, mathematics or architecture. An architect may plan a house and a contractor build it, and the structure be exacted according to specifications. If they want it sixty feet wide, ninety feet long and seventy feet high, these will be its precise dimensions, and it will contain various other predetermined features. But if the architect and the builder had to work by the science which is agriculture, the result of their efforts might be a building twenty feet wide, two hundred feet long and forty feet high; or it might be a hundred feet wide, twenty feet long and fifteen feet high; or it might be a hole in the ground.

The science of agriculture is comparable to the science of medicine; certainly it is not less complex. The physician invokes the aid of the natural sciences to aid the body to regain or retain health. The farmer invokes the natural science to aid Nature in the production of chosen plants. Neither can be certain that their efforts will bring desired results.

Men cannot make plants grow. The best they can do is to help provide conditions and environment under which the plants they want to grow may grow, to the exclusion of competing plants. Nature, working ceaselessly in the production of life and growth, works blindly and impartially. She favors the weed and the thorn and the thistle equally with the corn and the fruit and the wheat.

Those who expect the farmer to produce a crop of specified dimensions or quality do not understand or reckon with the forces which limit the results of his work.
Beet Tops a Valuable Feed

Chas. I. Bray, Colorado Agricultural College

With feed prices three times what they were ten years ago, more care should be taken of beet tops. An acre of beets will produce from 4 to 8 tons of tops. In a test made at the Colorado Experiment Station some years ago, beet tops made into silage without the addition of straw, showed a value for feeding dairy cows almost equal to corn silage, which is usually considered worth $6 to $7 a ton. The beet top silage was a dark, coffee color and was not eaten as readily as corn silage, but seemed to give as good returns for feed consumed. A number of feeders made beet top silage last year and obtained excellent results from feeding the silage to steers.

The easiest way to make this silage is in a trench silo 6 to 8 feet wide, 6 to 8 feet deep, and as long as may be necessary. The ends are sloped so that wagons can drive in, over the tops, thus packing them down. Alternate layers of straw may be put between layers of tops. Straw takes up some of the moisture from the tops, thus improving both feeds. When the trench is full, it is covered with straw and earth. The silage is cut out with a hay knife and taken out from the end.
THROUGH
THE
LEAVES

DECEMBER, 1917
E have had very special reason to celebrate the Thanksgiving season this year. The beet crop has been harvested with a minimum of trouble to both the grower and the factory; the sugar content has been very good, and the tonnage very satisfactory. In fact, the beet crop this year has proven a very attractive crop. Already we are learning of increased acreages to be planted in 1918. This is partly due to the increased price offered for the crop and partly from a desire to do a service for the government. There is more or less talk that the farmers are not doing their part in this war, but I am certain that when the final accounting is made, it will be found that they have responded nobly. It is difficult to figure out, however, where there is any sacrifice in growing sugar beets at next year's prices.

This year has been an ideal one for utilization of beet tops. The lack of storms has resulted in tops being very free of dirt. Also the good weather has allowed admission to fields. We regret to see so many fields being pastured off, as this is a wasteful way of using this valuable feed. We realize that it is not always possible to do otherwise, but a feed of so much value should be made to produce as much fat, either in the form of beef or mutton or butter fat, as possible.

We know the farmers of Northern Colorado are not realizing as much from this by-product of their beets as they can. One authority makes the calculation that beet tops have a value of from $40 to $50 per acre when properly siloed.
We have learned of a few growers who have refused to pay their labor this year the extra $1.00 per acre recommended by the Sugar Company last spring. There is no legal obligation to do this unless your contract so stipulated, but if you have had an average crop of beets, there is certainly a moral obligation to do this thing.

We are showing a picture on another page illustrating the method of covering our seed beets this fall for next year's seed crop. This work was previously done by men with shovels, but this grading machine and engine has done the work of from thirty to forty men and we believe has made a better job.

CORN SHOW

Boulder County is gaining quite a reputation for its corn. On December 12th, the Boulder County Farm Bureau will hold a corn show in Longmont that gives promise of being a big thing both in attendance and interest. If you are interested in corn growing you should be there.

The growing of sugar beets has no doubt been of great value to the production of following crops. The fibrous roots growing deep into the ground, and after the gathering of the crop, decaying there in the subsoil, form a decayed vegetable matter that furnishes a quantity of nourishment to the soil. A sugar beet is a root, the main part of which furnishes the crop as manufactured into sugar. The hundreds of little fibrous roots clinging to the main stem form a mat in the subsoil that enriches the land because they remain there. It has been figured that if these roots left in the ground only three quarters of an ounce for each beet, over one ton of vegetable matter is left to furnish humus underneath each acre. It is not so remarkable therefore, that crops following sugar beets are often better than otherwise, and irrigation no doubt contributes its share in decaying this vegetable matter and resolving it into humus so greatly needed in our mineralized soil.—From Denver Field and Farm.
United States Food Administration
Washington, D.C.

October 22, 1917

One of the most vital problems confronting this nation is that of procuring sufficient sugar to meet the requirements of our people and of the Allied Nations fighting our common battle. The production of cane sugar in this hemisphere can and will be increased to a limited degree. But we must rely upon the farmers in sugar beet producing sections of the country for a part of the needed supply. I, therefore, earnestly appeal to every farmer, so situated, to come to his country's aid in this hour of need. Without the cooperation of the American beet grower our task will be very difficult and our ability to respond to the calls to be made upon us for this very essential commodity will be curtailed. It is at least the duty of every beet grower to maintain in 1918 his normal acreage of sugar beets. It is his privilege to increase that acreage to the extent that a well balanced production of crops will permit, and in this manner effectively demonstrate his patriotism.

[Signature]
Delivering Beets

H. Mendelson

By Saturday night, October 27th, about 5500 farmers of Northern Colorado had delivered to us 900,000 tons of beets.

At the same date in
1916 we had received 475,000 tons
1915 we had received 500,000 tons
1914 we had received 690,000 tons
1913 we had received 770,000 tons

In most of our districts the harvest is 70-75% finished, while in potato districts 45-55% only has been delivered.

While usually favorable weather conditions are largely responsible for this speedy harvest, the Company also has done its best to receive beets as fast as possible in spite of unprecedented difficulties of obtaining dump crews and railroad equipment. It is safe to say that no other crop is taken off the farmers’ hands with equal speed and efficiency.

At our biggest station, Mosley, in the Fort Morgan district, were received 232 loads delivered by 40 farmers on October 24th. By 8 a. m., 50 full loads had passed the scale and 42 empty wagons, 22 of which had been unloaded over the dump and 20 into the pile. The dump opens at 6:30 a. m. By this time 15 wagons had already arrived. Everyone of these had been weighed back empty by 7:20, although only 7 of them had gone over the dump and 8 unloaded in the pile. Those arriving before 7 a. m. had to wait at least 15 minutes before the full load could be weighed, while those arriving after 7:20 were weighed without any delay. Evidently some farmers have calculated that nothing is to be gained by arriving amidst the early rush, as out of the 40 farmers delivering that day, 22 only had loads at the scale before 7 o’clock.

At most of our stations now, every farmer gets his due
share of the available car space, whenever he arrives, and therefore nothing is gained by increasing the congestion before the dump opens.

At some stations some farmers refused to recognize that alloting car space to everyone in proportion to his tonnage is the most just method to all concerned and the best method of avoiding delays, and by refusing to go to the pile, blocked the whole traffic for several hours, causing unnecessary delay to everybody.

On the whole, however, everybody has done his share to speed up the work.

The average time each wagon spent at the dump, Moseley, after the morning congestion was over by 7:30, was 13 minutes, if the load was dumped, and 35 minutes if the beets were shoveled into the pile.

The first twenty loads in the morning going to the pile averaged 32 minutes—the last 20 loads in the afternoon averaged 40 minutes—showing the effect of a day's hard work.

Having to store beets in piles is not a desirable operation, either to the farmer or to the factory. However, after the factory bins are filled, all beets in excess over the daily slicing capacity have to be stored in piles.

One way of avoiding the storage in piles is, therefore, an increase in the slicing capacity of the factories. Very few realize that the company has made great effort in the last ten years to do that.

Our Colorado factories sliced per day in

<table>
<thead>
<tr>
<th>Year</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1906</td>
<td>6781 tons</td>
</tr>
<tr>
<td>1911</td>
<td>10591 tons</td>
</tr>
<tr>
<td>1916</td>
<td>13285 tons</td>
</tr>
</tbody>
</table>

This year the factory in Brighton with a daily slicing capacity of 1000 tons was added. Unfortunately, owing to war conditions, this has not yet been completed.

With the unprecedented speed of delivery more beets had to be piled this year than ever before.

We are often asked why we do not build more storage bins at the factories. At some factories there is no space to provide the additional tracks and sheds. It costs up
to $3 per ton of beets stored to build tracks and sheds.

Beets which have been bruised by going over the screen into the cars and bruised again when dumped from the cars into the sheds do not keep well. If we stored beets under these conditions we would have to figure on a loss of at least 10% of the sugar we buy from the farmer in the form of beets.

However, we have installed a system of belt conveyors for the factory delivery at Greeley, Colorado and Gering, Nebraska. This is so far an experiment on a rather large scale.

Another objection to receiving the whole crop in a short time in railroad cars is that it would take an extraordinary amount of rolling stock for a short time and would make difficulties in the operation of the railroads.

Another possible improvement would be a mechanical unloading device to be used at the piles. This would have to be movable.

A group of farmers at a dump were discussing this and said that they would be willing to pay 10c per ton of beets unloaded if such a device were installed.

The Company has been and is still studying this problem from every angle, as any improvement facilitating the handling of the beets and keeping them at the same time in good shape would be a great benefit to the whole industry.

Such an installation must be absolutely reliable to be of service. This means among others that gasoline engines cannot be used.

Another solution of the problem is the siloing of beets. In the Scottsbluff district where this has been persistently practiced since 1910 it has worked out to the satisfaction of the vast majority of farmers, as is conclusively proved by an increase in the acreage contracted every year.

It is hard to understand why siloing should be a satisfactory practice in one district and so much condemned in another district.

There are, of course, arguments against siloing, but there must be others for it equally weighty.
Books and the Farmer

A. C. Maxson

Here are three kinds of farmers. First there is the so-called “Book farmer,” of whom the practical man likes to talk about when discussing college professors and graduates. Perhaps the writer’s definition of a Book farmer does not agree with that of our readers. By the book farmer we mean the city born and bred man who, after reading the Country Gentleman and other periodicals and books gets the “Back to the land” fever, buys a farm, makes a failure (usually) of farming and moves back to town and the office. No one advocates this method of acquiring a farming knowledge and experience. Occasionally a farmer of this type makes good because he had the ability to read intelligently and to apply the principles learned by reading and the capital and spunk to weather the period of adversity through which all book farmers must expect to pass.

Then there is what we will call the “Rule of Thumb” farmer for lack of a better name. This farmer does not believe in books, pays no attention to the work of agricultural colleges or the U. S. Dept. of Agriculture, but does things in the same way that his father did without taking time to study conditions and change his methods accordingly. If this man’s father was a successful farmer and he has inherited some of the ancestral good sense, he also will make a fairly good stab at farming. On the other hand, if the methods acquired from his paternal ancestor are not adapted to the particular locality where he happens to be farming, he is very apt to be a failure as well as the book farmer.

The man who is very sure to make a success of farming is the man who combines practical experience and
“book learning.” This we call the “Trained farmer.” This type is either born and raised on the farm or spends his young manhood on the farm learning by experience how to farm. At the same time he takes advantage of other people’s experience by reading or by taking a course in some good agricultural college. This farmer not only takes the best agricultural papers, reads the college and government bulletins, but has a library of good books on agriculture which he uses as a reference library.

Too many people think that all books are to be read from cover to cover like a novel. Instead, they are “canned” knowledge, to be opened and used as necessity requires.

To illustrate the way a reference library is used let us cite a few examples.

“A” wants to know how many tons of silage there are in his silo. He takes down King’s Physics of Agriculture, which contains almost anything a farmer wants to know about agriculture from the physical standpoint, and turns to the index and under “S” finds silos. Looking through the list of subjects under silos he finds “Capacity of, 424.” On this page under paragraph 526 he learns how to figure the capacity of his own silo.

“B” is a feeder and wants to know the value of alfalfa hay as compared with corn. If he has Henry’s Feeds and Feeding he turns to the index and finds that on page 204 alfalfa and corn are compared. Here and on the following page he learns that alfalfa will yield nearly twice as much dry matter as corn with the digestible nutrients of alfalfa far in the lead.

“C” is a dry-land farmer and interested in the conservation of soil moisture. He has King’s book “The Soil.” From the index he learns that on page 184 the subject of conservation of soil moisture is treated. In chapter 6 which begins here he learns the “Needs of Conserving Soil Moisture” and how to save moisture by plowing. The effect of early seeding and catch crops upon soil moisture is discussed. Harrowing and cultivating; soil mulches and many other subjects are mentioned also.
The real value of books lies largely in the fact that it makes it possible to use the experience of years of study and practical work. If each man began at the beginning we would get no farther than the best man could go in a lifetime. Use the experience of others as written in books, begin where they left off and make another mile post in the race rather than begin and end just where the first farmer did. Farming with books is a relay race in which each succeeding runner takes up the race, using the experience of the preceding ones, adds a little to it and accomplishes more by so doing.

During the long winter evenings which are coming, do more reading and next spring do better farming.

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**Meteorological Report**

**OCTOBER, 1917**

<table>
<thead>
<tr>
<th>Temperatures:</th>
<th>1917</th>
<th>1916</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Maximum</td>
<td>64.03°</td>
<td>61.4°</td>
</tr>
<tr>
<td>Mean Minimum</td>
<td>28.00°</td>
<td>31.3°</td>
</tr>
<tr>
<td>Monthly Mean</td>
<td>46.01°</td>
<td>46.3°</td>
</tr>
<tr>
<td>Departure from Normal</td>
<td>-2.79°</td>
<td>-2.70°</td>
</tr>
</tbody>
</table>

| Maximum | 83.0° on 6th | 79.0° on 2nd |
| Minimum | -5.0° on 28th | 15.0° on 18th |

**Precipitation in inches:**

| To Date | 11.85 | 10.47 |
| For Month | 0.91* | 3.61** |
| Greatest in 24 hours | 0.13 on 17th | 2.80 on 14th |
| Departure from Normal | -0.46 | +1.41 |

**Number of Days:**

| Clear | 13 | 18 |
| Partly Cloudy | 9 | 7 |
| Cloudy | 9 | 6 |

* Snow
** Rain
Drainage--The Cure for that Wet Spot

Alfred R. Williams

As the price of our farming land mounts higher and higher each year and with it the taxes on this same land, our attention must be turned to the reclamation of those parts of the farm that through alkali and lack of drainage, are not in a producing state.

Some of our land is naturally swampy, and this will require different handling than land made wet and alkaline by seepage and over-irrigation of crops. The acreage of natural swamp land in Colorado is considerable; our wet land falls almost entirely in this class. The importance of drainage in the present and future development of our farm land may be seen when we consider for a moment that there are one hundred million acres of swamp land in the United States, of which seventy-five million can be reclaimed. This is twice our total acreage planted to cotton, and three-fourths our corn acreage.

Now that our fall work is largely out of the way, at least as regards this year's crops, would it not be a good thing for us to give a little time and thought to draining that wet corner of the field, if it can be done at a reasonable cost? Nearly always it is our most fertile land that is alkaline, or is covered with water at certain times of the year, and now when we need every pound of food stuff that our land will produce, it will be conservation of the best kind if we can add a few acres more to next year's wheat, hay or beet field. For the increasing of crop production is as truly saving and conservation as is the care and economy in the use of the present year's harvest.

Unless there is a good natural outlet for either open or tile drains and plenty of fall for the draining system, no man can afford to put money or labor on a field without first having a careful survey made to determine the proper
location of the drain, grade of drain, and finally the depth of ditch or tile trench needed. Many drainage projects have been condemned as failures through an improper location and lack of a definite system for a given tract of land.

Iowa, where drainage has been developed greatly within the last fifteen years, has had many instances of this kind; we should profit by their mistakes. One of the mistakes has been that of putting in drain tile too small to carry off the water. The greatest run-off, or amount of water to be taken care of, should be known pretty accurately, and by the use of tables, such as Kutters' or Eliots', the size of tile can be determined without any estimating.

Another mistake often made is in putting lines of tile too far apart. Especially are these lines apt to be too far apart if their depth is four feet or less. The writer has seen alkali'd fields which, after two years service from the tiles, still had strips of alkali land midway between two lines of tiles. These lines in particular were two hundred feet apart. It is expensive work to remedy these flaws, once they have been made, and the tile put in. The grade,

Figure 1. Showing tile not laid properly to grade.
too, is a matter of great importance, especially where there is little fall to go on from the field to the outlet. The fall should be distributed evenly through the entire length of the tile of the same size; (for the same velocity of the drainage water, there will need be less fall in a large tile than a smaller one). If there are sags in the line, trouble is bound to occur from sediment collecting and in time nearly closing the tile at these points. This is illustrated in Figure 1. The choice of a drainage system will depend on the lay of the land, the nature of the soil, and the amount of water to be carried away. There are three general systems in use, the natural, herringbone and gridiron. In the west, the natural system is used more than the others, for as yet, we have no large drainage systems caring for large areas or relatively flat, low land. These systems are illustrated in Figure 2.

![Figure 2. Systems of Tile Drains.](image)

The writer is aware that there are districts where the drainage problem must be met by co-operation between several farmers in order to get the best and cheapest results. No man can drain his own land and put his outlet in such a position that the water will harm his neighbor’s land, possibly land that before was free of alkali. In time drainage districts will be established as there have been in the middle western states, and the cost of drainage distributed equally by assessments on those lands directly benefitted.
Covering Stecklings for Next Year's Seed Crop
KEEP UP SUGAR CROP
U. S. Department of Agriculture Urges Farmers to Maintain Next Year's Acreage of Sugar Beets

In its consideration of the problems of crop production that are of special importance during the war emergency, the United States Department of Agriculture calls the attention of farmers in the sugar beet producing districts to the importance of maintaining the acreage of that crop next year. While the soil and climatic conditions of the country are suitable for a much greater production of beet sugar than is now made, the production for next year is necessarily limited by the available seed supply and to the relatively small areas where beet sugar mills now exist.

Limited Area Necessitates Efficient Methods

Because of the impracticability of shipping beets very far, the effective sugar beet production is limited to the areas in the vicinity of the sugar mills, and it is in these areas that most of next year's crop must be grown. Both from the point of view of the welfare of the farmers of those districts and of the national interest with regard to adequate supply of sugar, it is important that the crop shall be grown as efficiently and economically as possible. It is believed that this can best be accomplished by adhering somewhat closely to the methods of crop rotation that have been worked out and tested in most of these producing districts, and by avoiding the planting of an abnormally large acreage of competing crops at the expense of a reduction of the acreage of beets. The determination of the acreage to be planted needs to be made early so that the farmers can plan their work to best advantage and the sugar companies arrange in advance for the supplies necessary to operate the mills.

The sugar requirements of this country and the allied nations during the next year or more will be such as to render it imperative from the standpoint of national interest that our production of sugar be at least maintained at its present level. It will in fact be highly desirable to enlarge it if the stocks of seed available for planting in 1918 shall permit of this.
Dinner Always Ready in a Self Feeder
Dumping Stock on the Markets

J. F. Jarrell

The high price of hay seems to be the cause of selling many female and immature cattle. Some of us are losing sight of the fact that $15.00 hay sold from our stacks and removed from the farm would become $20.00 hay if allowed to walk away from the farm in the shape of finished beef. Our gambling spirits are trained by past experiences and it is hard for us to realize the difference between these abnormal times and the times in the past which we have accepted as normal times. We cannot justly claim ignorance as the reason for getting rid of stock which should be held. While some of it is done because of that fact, the main reasons seem to be selfishness which in this case has gone off half-cocked, and the irresistible desire to ape some one who claims to have a hunch that the nation is going to the dogs any way and he wants to get his while the getting is good.

It is reported that one western state has shipped 40,000 more cows this year than during the same period last year. Some of this is due to other sections seeing the need of breeding stock and buying from their short-sighted neighbors. The bulk of the shipments seem to be headed for the packing houses, where their days of usefulness will soon be ended.

Developing a herd of cattle is a slow process even though we have mature breeding stock to begin with. The younger the breeding stock the longer it will take, until we reach a point where the breeding stock is unborn, then it is only a step until it will have no mother, which leaves us in a pickle indeed.

Some people seem to think they can take a pair of cattle and go into the production of beef as speedily as though they were Belgian hares or Guinea pigs.
All of us realize that to top the market with a fine bunch of steers is quite an accomplishment and the man who does this is entitled to commendation provided he does it without the sacrifice of female stock.

The humble cow, like the woman of China, has been pushed into the background in order to allow her male offspring to make a showing. This might be the proper thing to do in a few cases, but eventually we are compelled to admit the fact that a population of males would soon disappear from the earth as living beings.

Some far-sighted, level-headed farmers have always practiced the proper method of conserving their herds. These men are still doing their bit and the flood of suggestions which is published these days will not affect them any more than the signing of a food conservation pledge affects the household practices of a minister’s wife.

The man who produces one more finished beef animal by the proper use of his feeds is as truly serving his country as the man who has so bravely entered the service of the nation for her defense.

The great war is not yet over; our people may be called upon to make some sacrifices in the future which we have not dreamed of as yet. Whether the war lasts long or not, an adequate supply of beef is essential for our welfare, so let’s add some thought to our supply of feeds and save our young steers and finish them for the butcher, weighing from 1200 to 1500 pounds. Let us give the cow and heifer her chance to do her bit by bearing young and if possible see to it that the young are sired by the proper kind of bull for beef production. Don’t breed a scrub Jersey to an outlaw Holstein and expect first class beef type offspring. You might as well expect to make a dollar by melting two dimes and pouring them into a dollar mould.

Finally, don’t sell the cow or heifer unless she is barren, for our nation needs her offspring and the need is likely to increase as time goes on.
Effect of Good Roads on Pulling Power of Horses

E. B. House
Colorado Agricultural College

A very interesting experiment has recently been concluded in California to determine just how much a horse pulls when he draws a ton. A good draught team was used for this purpose. The horses weighed 1600 pounds each. They were hitched to an ordinary farm wagon, and pulled a load of 6,000 pounds over different kinds of roads. The wagon was a standard farm wagon with steel axles of equal length, wheels 38 and 46 inches in diameter, and four-inch tires.

A recording dynamometer, known as the Iowa type, was used to register the tractive force of the team. This instrument makes a record of the resistance on a strip of paper under a recording pencil, and after the test, the total pull of the team can be read off in pounds. The record of the test is as follows:

On a concrete road, unsurfaced, in excellent condition, the total pull on the load was 83 pounds, or 27.6 pounds per ton.

On a concrete road with 3-8 inch surface of asphaltic oil and screenings, road in excellent condition, the total pull was 147.6 pounds or 49.2 pounds per ton.

On the ordinary macadam road in excellent condition, the total pull was 193 pounds or 64.3 pounds per ton.

For a gravelled road, compact, and in good condition, the total pull was 225 pounds or 75 pounds per ton.

An earth road, firm, with 1 1-2 inches of fine, loose dust, the total pull was 276 pounds or 92 pounds per ton.

An earth road, with mud 4 to 6 inches deep, but soil
firm underneath, the total pull was 654 pounds or 218 pounds per ton.

On graveled road, before the gravel had been compacted, but when it was in ordinary loose condition after it had been placed upon the road, the total pull was 789 pounds or 263 pounds per ton.

The above shows very well what great advantages good roads have as far as the hauling properties of a team are concerned.

More Hogs Needed

H. H. Simpson

The following statement of information regarding the hog situation has just been received from the Department of Agriculture:

Three things stand out prominently in the swine situation at the present time:

1. There is a decrease in the number of hogs in this country.
2. There is an increase in grain feeds.
3. There is a strong demand for pork products and this is constantly increasing.

With hogs selling at 18 cents a pound and corn at relatively high prices, there is a tendency on the part of farmers to sell short on both corn and hogs. But farmers should be reminded that when such conditions exist the value of brood sows is proportionately increased.

Hogs furnish meat and fat more quickly and more cheaply than other meat animals. More pork is handled by the packers in this country than all other meats combined. Since the beginning of the war the number of swine in belligerent countries has decreased rapidly. There are less hogs in the United States in 1917 than there were in 1915. Our exports of pork products increased from
405,000,000 pounds with a value of $55,000,000 in 1914, to 981,000,000 pounds having a value of $175,000,000 in 1917.

The total net decrease of the western allies has been over 7,000,000, and that of all the European nations more than 32,000,000 head. Pork is the most satisfactory meat to ship long distances and to store after reaching its destination. High prices for both pork and feed, the immediate need of warring countries for meat and fats, causing unprecedented demand, the lack of an appreciation of what the consequences from this wholesale slaughter and export will be to ourselves and our allies are factors which have left us facing a situation which demands careful and immediate consideration.

The big meat problem in this country is quick production.

Conditions in this country today are right for stopping this decrease, and raising more swine than ever before.

It is estimated that there will be an increase of 627,000,000 bushels of corn this year. Most of this must be fed and corn will probably be lower in price. There is also an increase of 329,000,000 bushels of oats and 21,000,000 bushels of barley. Iowa, for instance, has 26% more corn, and 15% less hogs to which to feed this crop. This state can feed 1,500,000 hogs on the increase of corn if it is retained in the state.

In the Northwestern states where the hog population is small it should be increased greatly. The following suggestions are offered in a program to secure this desired increase in swine production:

More boys should be encouraged to join Pig clubs.

In the feeding of swine the utilization of garbage should be practiced where feasible. Corn alone is not the most economical feed for fattening hogs, but grain mixtures and forage crops should be used. Fatten hogs on self feeders.

More curing of pork products should be practiced.

Do not sell feeding stock.
Utilizing Beet Tops

J. A. Brock
From “Facts About Sugar”

(The following paper by the Agricultural Editor of Facts About Sugar calls attention to a valuable by-product of sugar beet cultivation of which too little use has hitherto been made in the United States. Coming at a time when the problem of conserving and increasing the country's food supplies, both for human and animal use, is being recognized in its full seriousness, Mr. Brock's article deserves the careful attention of every beet farmer.—Ed.)

An Unappreciated Product

The value of sugar beet tops and leaves as an important by-product in sugar beet cultivation is being rapidly recognized by farmers throughout the United States. There are, however, a great many farmers, especially in the western states, who overlook or underestimate the actual value of these by-products to such an extent that they make practically no attempt to increase their net revenue from their beet crop by the proper utilization of these portions of the plant.

In many instances which have come under the observation of the writer, no attempt was made by the beet grower to feed the tops and leaves, these portions of the plants being allowed to lie and rot on the field, without rendering other service than that of returning to the soil certain mineral elements which had been absorbed by the growing beet. While these portions of the plant contain a certain amount of salts which are beneficial to the soil, it has been demonstrated that the practice of permitting them to rot on the field is neither efficient nor economical.

Another wasteful method of utilizing tops and leaves is that of permitting the stock to enter the field after harvest for the purpose of consuming them. While it is true that this is the easiest way, it is by no means the most
efficient and in addition to this, it is the most dangerous. Stockmen figure that two acres of beet tops and leaves, fed in this manner will feed a steer for 60 days and that he will gain about 130 pounds, providing he is able to consume all of the tops and leaves in the field. However, this is rarely possible owing to the fact that if cold weather sets in before the crop is consumed, as is generally the case, the piles of tops and leaves will freeze, the leaves become dry and break off, the tops or crowns become hard from drying out and freezing and if the frozen lump which is thus formed does not get stalled on the way to the pouch (frequently a cause of death of animals pastured on beet tops), the animal has a stomach full of frozen feed which it has to thaw out at the expense of its body heat. It will also be found in such cases that the animal will only eat sufficient tops and leaves to satisfy its hunger and barely take sufficient hay to stand the weather and be able to have enough surplus heat to thaw out another meal of tops and leaves it likes so well.

On the other hand, if the weather is not severe, and the tops and leaves do not freeze, the animal will eat nothing else. Due to this fact, many a calf and a horse has been lost, since these portions of the beet contain a considerable amount of oxalic acid.

Another objection to pasturing the stock in the beet field is that while eating the stock buries more feed in the earth by tramping, than it eats.

In view of these facts, it is obvious that the practice of permitting these by-products to remain and rot in the field or the more general practice of permitting the stock to pasture in the beet field, should be discontinued.

When the practice of siloing beet tops and leaves has been followed in European beet growing countries for many years, it has only been during the last few years that this method of handling them has been in vogue in the United States. It has been demonstrated, however, that this is the most efficient method of handling and the results obtained have shown that the slight additional expense of siloing is much more than offset by the results obtained.
Value as Silage

Space will not permit a general discussion of the food value of siloed beet tops and leaves as compared with the food values of other silage; nevertheless, it will be well to note that actual experience has shown that an acre of tops and leaves from a normal beet crop, properly handled, produces as much food as half an acre of corn silage. It is obvious, therefore, that whatever the value of half an acre of corn silage is to the farmer, the same value can be placed on an acre of beet leaves and tops. In other words, if the farmer can afford to raise corn silage, he can certainly afford to take the proper care of his beet tops and leaves. Experience has also shown that when the tops and leaves are pastured they return about $6 per acre. If properly siloed they are worth from $40 to $50 per acre.

Many farmers, no doubt, have refrained from siloing these by-products for the reason that they were of the opinion that, in order to do so properly, it would be necessary to erect an expensive silo. This, however, is not the case. There are various types of silos that have been found to be ideal for siloing these by-products, and the writer would suggest that the farmer adopt the style which is best suited to his particular conditions.

Type 1.—This is known as the "rick silo" and is the most inexpensive. The general plan of siloing the tops and leaves by this method is to place a layer of straw on the ground and then pile the tops and leaves to the height of about five feet. After this, another layer of straw should be added. On top of this layer of straw, from one to two feet of earth should be added in order to exclude the air. The writer would call attention to the fact that the amount of earth used to cover the mass must be governed by the weather conditions. If it is extremely cold, a greater amount of earth covering should be used.

Some farmers who use the rick silo have found it advisable to alternate layers of tops and leaves with layers of straw. This, however, is a matter which can be left to the farmer.

Type 2.—This form of silo is made by digging a trench about five feet deep and from eight to ten feet wide, the
length being determined by the amount of tops and leaves to be siloed. Care should be taken in making this type of silo to give the bottom a slight slant in order that there may be sufficient drainage.

Type 3.—In this type the trench need only be about two feet deep, the earth coming from the pit being used to build the walls above the earth surface. This type is recommended in cases where excavation is difficult or where a layer of hard soil is present.

Attention is called to the fact that all of the pit siloes are so constructed as to permit the farmer to drive in with his wagon. If the amount of tops and leaves to be siloed is large, the size of the silo may be increased. However, the writer is more inclined to favor the small silo, and if one of them is not sufficiently large it is practically as easy to make another as to make one large silo.

This is also a matter which must necessarily be left to the farmer. Many farmers have had excellent results with extra large silos. Where the large silo is to be used, it is suggested that it be made large enough to permit the wagon to turn around. This will greatly facilitate unloading and will eliminate the necessity of having a runway at each end.

There are two general methods used in placing the tops and leaves in the silo; these being known as the "regular" and "layer" methods.

In brief, the "regular" method consists of placing a layer of straw in the bottom of the silo, after which the tops and leaves are added until the pit is full. The "layer" method consists of alternating layers of straw with layers of beet tops and leaves.

The general method of covering the silo is to place a layer of straw on top of the mass, after which a layer of dirt is added. Some farmers have had excellent results from not using the earth covering. In these cases, however, a straw stack has been placed on top of the silo, which serves the same purpose, providing care is taken to exclude the air.

(To be concluded)
Keep Cow's Record

From "Weekly News Letter" U. S. D. A.

HAT the appearance of a dairy cow cannot be depended on to indicate her production of milk is illustrated by a demonstration conducted under the auspices of the Dairy Division of the department with a herd of nine cows at the National Dairy Show held recently at Springfield, Mass.

A year's record of milk and butter fat already had been made for all the cows of the herd. During the show complete records of production and feed consumption were kept and in every case the previous records were duplicated. Some of the cows were of poor dairy type, yet were good producers; others were of good dairy type, yet were poor producers; still others of similar appearance had greatly different records. Of the last-named class were Nos. 8 and 9. Many experienced stockmen selected No. 9 as the better of the two, but the records showed that for the last year No. 8 gave 8,445 pounds of milk and 346 of fat compared with 4,279 pounds of milk and 198 of fat for No. 9. This served as an object lesson to the hundreds of people who daily viewed the demonstration that good dairy type is not always associated with large production and that poor dairy type does not indicate lack of large yield.

"What does it cost to keep records?" was a common question of the dairymen. In cow-testing associations, where the above-quoted records were made, the charge is $1.50 a month for each cow, and in addition the board of the tester for one day each month. With feed, labor, and live stock so high, it certainly is imperative to eliminate
every unnecessary expense like the “boarder” or “robber” cow that fails to pay for even her feed.

In the big room at the dairy show where the cows were stanchioned were several hundred comfortable seats. Here several times each day well-known dairymen from various parts of the country talked to the large audiences on dairy problems, illustrating their remarks with the cows of the demonstration herd. Especial emphasis was laid upon the value of records in economical management.

Cooperative bull associations were carefully described and their many advantages explained. That it was possible to have high-class bulls of the finest breeding for the use of a dairymen with only a few cows seemed to many farmers as too good to be true, especially when the cost was even less than in the case of scrub bulls. In this connection the charts that illustrated the conditions at Roland, Iowa, before and after the organization of a bull association, elicited much interest. At that place, for a yearly investment of $7.50 each, the members have the use of five $240 bulls for 10 years.

On the walls of the demonstration room were pictures of famous dairy animals, charts showing results of record keeping, etc. Adjoining were skeleton milk or dairy houses with sides only partially finished, to show the construction; also a model of a dairy barn and of a silo. In the milk houses was dairy equipment, and a man in charge answered questions on dairying and explained the construction of these and all other kinds of dairy buildings.

At regular periods demonstrations in the sterilization of milk utensils were given with the inexpensive farm sterilizer described in Farmers Bulletin 748; these demonstrations were well attended.

There was also keen interest in every part of the demonstrations, as may be judged from the fact that about 5,000 people listened to lectures and fully 15,000 viewed the exhibits.
Value of Crops in Buying Farm Machinery

L. F. Garey
Colorado Agricultural College

An article is high or low in price according to its value in comparison with other articles or commodities, and with the purchasing power of labor. For example, the increase in the price of farm implements in the past two or three years has raised the question as to the advisability of a wider purchase of new implements than where normal conditions prevail.

In 1910 it required 208 bushels of corn, 294 of oats or 114 of wheat to buy $100 worth of farm implements. In 1916 it required only 130 bushels of corn, 225 of oats or 70 bushels of wheat to purchase the same implements at a 10 percent increase, or $110. Only 141 bushels of corn, 243 bushels of oats or 76 of wheat were required to purchase the same implements at a 20 percent increase, or $120; 159 of corn, 286 of oats or 89 of wheat at a 40 percent increase or $140. Was the purchasing power of these crops increased as much as the price of machinery?

Corn was worth 48 cents in 1910 and 85 cents in 1916. Two hundred and eight bushels at the 1916 price purchase $176 worth of machinery or allow for an increase of 76 percent in the price of farm implements. Oats had a value of 34 cents in 1910 and 49 in 1916. At the 1916 price, 294 bushels would buy $144 worth of implements or allow for an increase of 44 percent on farm implements. Wheat was 85 cents in 1910 and $1.58 in 1916. At the 1916 price, 70 bushels would buy $180 worth of implements or allow for an increase of 80 percent.

The increase in the price per bushel of farm crops has been from 40 to 80 percent while the increase in the price of farm implements has been much less.
Save the Machinery

From “Successful Farming”

The loss in farm machinery by exposure to weather has always been tremendous. Unless unusual precautions are taken this loss will be greatly increased this year. All kinds of farm machinery have increased in price, but it takes no more exposure to put a high-priced implement out of commission than it does a similar implement that cost much less. The greater the investment the greater the time and expense that can profitably be spent in protecting it. A man can profitably spend more to protect a machine that costs $175 than he could have spent to protect the same machine when he could buy it for $125.

Furthermore, the protection of farm machinery is of utmost importance this year for the reason that it has never before been necessary to consider. Heretofore a man could always purchase a new machine as soon as his old one failed to work, provided he had the price. Whether or not it will be possible next year for all to purchase farm implements and machines who desire to do so is a question. Manufacturers are experiencing great difficulty in obtaining material and there is great possibility that they will not be able to meet the demand which is likely to be considerably greater than normal. Every machine or implement that with good care will render service for another season should receive the best of care.

To put machines under cover as soon as the season’s work with them is over is one of the most effective means of lengthening their lives. Each additional hour of use obtained from a machine is equivalent to reducing the price of that machine.

Other protective measures which are worthy of special mention at this time are to go over every machine carefully, tightening the bolts, replacing broken parts, and oiling all parts that are likely to rust. Paint is also an economical preserver of farm machinery.
Price Fixing

Miller Purvis
From "Breeder's Gazette"

In southern Idaho we agree with what L. Ogilvy says in The Gazette for August 23 about price fixing. One of our prominent western dailies said a day or two ago, and it is probable that its information came from an Associated Press dispatch, that Mr. Hoover had stated he had no authority to fix prices on anything but wheat. Wheat at a minimum price of $2.20 per bushel, which is equal to 3 2-3 cents per pound, is one of the most profitable general crops we can grow here. The average crop is right around one ton per acre, with many crops greater. We raise spring wheat exclusively and it is a certain crop, as we can regulate the supply of moisture and the climatic conditions are all favorable. With the prospect of a good price hundreds of acres of alfalfa were turned under and seeded to wheat. This has made alfalfa hay jump nearly 100 per cent in price, from an average of less than $8 per ton to $15 as the minimum, with a prospect of higher prices.

The sugar beet companies have advanced the price of beets from $5 to $7.50 per ton, with an added bonus for beets analyzing more than 15 per cent sugar and a division of profits after paying the cost of the beets and $1 per 100 pounds of manufacturing costs. At this price, with 12 to 15 tons of beets as the yield per acre, the raising of beets becomes very profitable and hundreds of acres of alfalfa have been plowed under and planted to beets right in my neighborhood.

These conditions send hundreds and thousands of cows to market and make the price of butter in local markets 50 cents per pound. As Mr. Ogilvy says, piecemeal price fixing seems about the worst way of handling the situation, because it fixes public attention on just one crop, which is likely to dominate to the injury of all other farm products.
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Maintenance of Roads More Important than the Building

E. B. House, Colorado Agricultural College

The greatest waste of public moneys that is committed today is in surfacing our country roads and then apparently abandoning the same. No county that engages in real road building can afford to dismiss its workmen when the road has been constructed. The fact of the matter is, that the work is just then well under way.

It rarely ever happens that the initial work on the road is done wisely, but there are a multitude of little things that later must be added or repaired in order that the road may be in good condition. Ruts and chuck holes are sure to form and these must be filled or the road soon goes to pieces. These things should be planned for and done quickly if the improved road is to do the fullest service, and this is the one thing that it seems to me some of our county commissioners are neglecting. They become so imbued with the idea of building good roads that they fail to prepare for the maintenance of roads already constructed.