Eight Observations on Segmented Seed

Comparison of Whole Sugar-Beet Seed Balls and Segmented Seed in Plantings at Fort Collins, Colorado

By G. W. Deming, Associate Agronomist

Whole and segmented seed were compared in a test planting on the Agronomy Farm of the Colorado Agricultural Experiment Station at Fort Collins, Colorado, in 1942. From the results of this test and other observations it is probable that:

1. Use of segmented, or sheared, seed at 7 pounds per acre planting rate, or less, will produce adequate stands.

2. The optimum initial stand is the least number of seedlings, consisting of a high proportion of single plants, that will give an adequate thinned stand.

3. The 1942 tests at Fort Collins, Colorado, do not indicate the lowest practical rate of seeding of segmented seed, but do indicate that 7 pounds per acre was more than was needed under germination conditions that were not especially favorable. Adequate thinned stands from segmented seed planted at rates much less than 7 pounds per acre have been reported from other irrigated districts.

4. If light seeding of segmented seed is to be used, extra care in the preparation of a firm seed bed, the surface of which is not dried out by excessive working, together with early planting, seem highly important. Planting depth should approximate one inch.

5. On the stands obtained from segmented seed, the job of thinning can be done with a long-handled hoe without finger work in thinning.

6. Many more weeds may be left with the long-handled hoe method of thinning, and with other time saving methods of thinning, than are left by the conventional hand-thinning method. The importance of having clean ground for planting segmented seed should be stressed.

7. Thinning with the long-handled hoe probably should begin even earlier than the early thinning now practiced in the Fort Collins district. It can be started as soon as the young seedlings are easily distinguishable by the laborer in his standing position, provided the seedlings are sufficiently established that a shallow hoe stroke does not dislodge the plant to be left. The leaving of more weeds by this method of thinning which may make the first hoeing of the thinned stand a longer job does not appear to be a serious factor because there is less pressure to get the latter job done than is the case with the thinning job.

8. Apparently, under Fort Collins conditions, in any method of "mechanized" thinning, there is a tendency to leave too many, rather than too few, plants. This tendency on the part of field labor is readily understood. As experience with mechanized methods increases, the quality of the thinning job may be expected to improve.

The seed used in these tests, from which the foregoing conclusions have been drawn, was Great Western Commercial stock from the warehouse of the Fort Collins factory. This seed lot was divided into two portions, one being segmented by the Great Western Sugar Company at their Long-
Comparison of the whole seed (larger) with segmented seed. It is probable that somewhat less than the lowest seeding rate in this experiment, 7 pounds per acre, would have resulted in adequate stands, the author states.

mont Experiment Station and the other used as whole seed balls.

The field in which the test was located had been in alfalfa for several years prior to 1940; it was manured (rather trashy manure) and spring-plowed for oats in 1940; winter wheat was grown in 1941: the field was manured (12 tons rotted manure per acre) and fall-plowed for beets in 1942: 120 pounds of 45-per cent superphosphate was drilled across the direction of the beet rows in March, 1942.

The experiment was set up in randomized-block design, seven treatments and four replications, with the replications side by side; thus the test was one plot long and 28 plots wide. The plots were four rows wide and approximately 180 feet long. Spacing of the rows was 20 inches and the approximate spacing of plants in the rows was 10 inches. A section of each of the two center rows 100 feet in length was harvested from each plot.

Treatments 1 to 6 were planted with a John Deere No. 55 planter, the planting being supervised by E. M. Mervine (Bureau of Agricultural Chemistry and Engineering): treatment 7 was planted with an older John Deere plate planter.

Counts of initial stands were taken June 4 by Mr. Mervine. Counts of the thinned stand were taken in October on the full length of the second row of each plot. The harvested stand was obtained by a count of all (regardless of size) beets harvested on 200 feet of row per plot. The test was planted April 15, thinned June 4-6 and harvested November 3 and 4. Two random 20-beet samples were taken for analysis and the balance of the beets from each plot were washed before weighing.

Thinning of treatments 1 to 6 was done with a long-handled hoe by a laborer with long experience in blocking with this type of hoe. The plots given treatment 7 were thinned by labor with the conventional short-handled hoe. Some parts of the test were moderately "grassy" (Setaria sp. and wild oats).

The plots and the test as a whole were too small for accurate measurement of the time required for thinning. In this test the conventional thinning was only slightly slower than that done with the long-handled hoe. However, the man with the long-handled hoe did a much better job of leaving only singles and cleaning out weeds than would be expected from average laborers.

Results of this test are given in the summary as 4-plot averages.
Comparison of Results Obtained by Planting Whole Sugar-Beet Seed Balls and by Planting Segmented Seed.—Fort Collins, Colorado.—1942

7x4 randomized-block designs, 4-row plots 180 feet long, 20-inch spacing of rows, plants spaced in row at approximately 10-inch intervals. 100 feet each of 2 center rows harvested for record. Treatments 1-6 were thinned with long-handled hoe; treatment 7 was blocked with short-handled hoe and hand thinned.

(RESULTS GIVEN AS 4-PILOT AVERAGES)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Planter</th>
<th>Initial Stand(\times)</th>
<th>Harvester Stand</th>
<th>Acre</th>
<th>Sugar</th>
<th>Roots</th>
<th>Sucrose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Per Cent</td>
<td>Per Cent</td>
<td>Per Cent</td>
<td>Lbs.</td>
<td>Tons</td>
<td>Per Cent</td>
</tr>
<tr>
<td>1. Whole seed balls, 13.3 lbs. per acre, untreated</td>
<td>John Deere with single seed plates</td>
<td>32.2</td>
<td>15.5</td>
<td>209</td>
<td>10.5</td>
<td>124.4</td>
<td>4,168</td>
</tr>
<tr>
<td>2. Segmented seed, 7 lbs. per acre, untreated</td>
<td></td>
<td>33.3</td>
<td>17.2</td>
<td>202</td>
<td>7.2</td>
<td>121.5</td>
<td>4,282</td>
</tr>
<tr>
<td>3. Whole seed balls, 13.3 lbs. per acre, treated (Ceresan)</td>
<td></td>
<td>33.3</td>
<td>17.2</td>
<td>202</td>
<td>7.2</td>
<td>121.5</td>
<td>4,282</td>
</tr>
<tr>
<td>4. Segmented seed, 7 lbs. per acre, treated (Ceresan)</td>
<td></td>
<td>33.3</td>
<td>17.2</td>
<td>202</td>
<td>7.2</td>
<td>121.5</td>
<td>4,282</td>
</tr>
<tr>
<td>5. Whole seed balls, 16.6 lbs. per acre, untreated</td>
<td></td>
<td>40.0</td>
<td>18.0</td>
<td>214</td>
<td>18.2</td>
<td>136.4</td>
<td>4,017</td>
</tr>
<tr>
<td>6. Segmented seed, 8.75 lbs. per acre, untreated</td>
<td></td>
<td>28.8</td>
<td>9.0</td>
<td>198</td>
<td>14.5</td>
<td>118.6</td>
<td>4,259</td>
</tr>
<tr>
<td>7. Whole seed balls, 23 lbs. per acre, untreated</td>
<td>John Deere, ordinary plates</td>
<td>33.5</td>
<td>16.0</td>
<td>207</td>
<td>3.8</td>
<td>122.0</td>
<td>4,276</td>
</tr>
<tr>
<td>General Mean</td>
<td></td>
<td>33.5</td>
<td>16.0</td>
<td>207</td>
<td>3.8</td>
<td>125.4</td>
<td>4,234</td>
</tr>
</tbody>
</table>

1 The number of inches in 100 inches of row which contained beets was determined on June 4, the occurrence of singles being noted. Results are expressed as percentages.

2 Total hills in the full length of the second row of each plot (180 feet) were counted in October, regardless of spacing if plants were obviously separate; multiple hills counted as such where plants were immediately adjacent (approximately touching). Most of multiples were doubles and many were one large and one very small beet—the latter possibly a late-emerging seedling.
Discussion

In this immediate territory seedling diseases usually do slight damage and losses of stand from this cause are seldom of much importance. In this test there was little evidence of loss of seedlings from attack by pathogenic fungi; seed treatment probably did not affect either stands or yields.

The yield of treatment 5 is more than twice the standard error of a difference below the mean yield of the test. This treatment had the heaviest stands and was rather consistently low in yield for all replications. The stands of all treatments in the test were more than adequate to produce maximum yields and it is possible that the relatively low yield of treatment 5 is, at least partially, attributable to this heavy initial stand and its subsequent high population.

The test as a whole tends to indicate that the use of other than conventional thinning methods is as likely, or more likely, to result in the leaving of too many rather than too few plants.

Since all seeding rates in this test produced relatively heavy thinned stands, it appears that the best rate of seeding was the lightest. Seeding of this test was followed by heavy precipitation (rain and snow) and a period of low temperature. Germination and early growth of the seedlings was very slow for the time of year. It is probable that somewhat less than the lowest seeding rate, 7 pounds per acre of segmented seed,
EXCELLENT reservoir and snow conditions favor the 1943 sugar beet crop. Reservoirs serving farmers in northern and eastern Colorado had 554,856 acre feet in storage March 1, which was 156 per cent of corresponding 1942 storage and 237 per cent of 1941 storage.

Equally gratifying was the outlook March 1 for Nebraska farmers with the largest carryover of irrigation water since 1929. Water storage March 1 in reservoirs under the Pathfinder system was 534,000 acre feet compared with 321,000 the same date last year. Lake Minatare had 32,000 acre feet March 1, which was greater than on March 1, 1942. Reservoirs serving Wheatland, Wyo., held 37,000 acre feet on March 1 against 16,000 in 1942, while snow water back of these reservoirs was 168 per cent of last year.

Snow surveys and irrigation water forecasts March 1 gave a most favorable outlook to farmers according to Ralph L. Parshall, irrigation engineer of the Soil Conservation Service, Fort Collins. For the South Platte above Denver the water content of the snow was about 15 per cent greater than in 1942; Clear Creek more by about 75 per cent; Boulder, by 60 per cent; St. Vrain 40 per cent; Big Thompson 60 per cent; and Poudre 50 per cent.

Lamb Brings $834.50

A CHECK for $834.50 was recently turned in to the American Red Cross by L. C. (Jim) Hoover of the Hoover Sales organization, as a result of the auctioning of a lamb donated by Jake Eisenach, Jr., a beet grower of near Atwood, Colorado. Eighty-two persons bought the lamb for amounts ranging from $5 to $20, Mr. Hoover, who cried the auction, stated. After each purchase the animal was again donated and sold, until finally Mr. Eisenach re-purchased and retained it.

Henry Reitz of the Sarben district, Ovid territory, is moving on the A. W. Peterson farm joining Sutherland.

Proverbs 20:4

The sluggard will not plow by reason of the cold; therefore shall he beg in harvest, and have nothing.
"An Increased Sugar Beet Crop in 1943 Is Essential to Victory!"

Says The Office of War Information, Regional Announcement No. 4, Feb. 22, 1943.