TESTING DRYLAND COVER CROPS/CROP ROTATIONS WELD COUNTY

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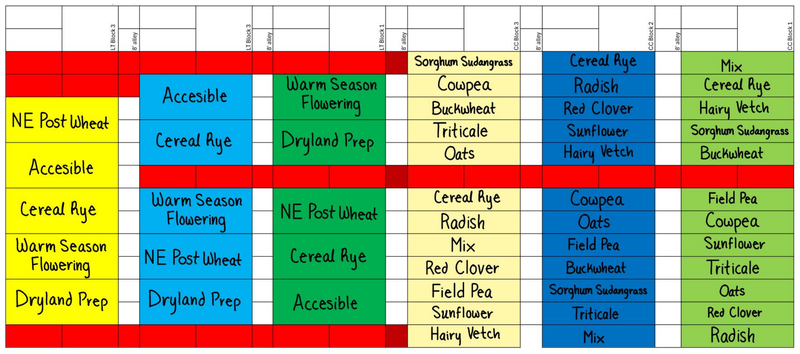
PROJECT INTRODUCTION

My project at White-Plumb Learning Center, Greeley, Colorado involved working on cover crops in a crop rotation in a field behind the historical site. We used buckwheat, cereal rye, cowpea, field pea, hairy vetch, oats, radish, red clover, sorghum-sudangrass, sorghum grain, sunflower, and triticale individually and in mixtures. In the back half of the field, we planted individual crops with one mixture as part of a short-term rotation that will last three to four years. In the front half, we planted mixtures of the cover crops listed along with plots of cereal rye in a long-term rotation intended to last ten years.

Figure 1. Plot Map of the Field at White-Plumb Farm



INTERNSHIP GOALS

The goal of this internship is to establish which crops can be used as cover crops in a dryland field. Our aim was to determine which of these crops could be used to improve soil quality and suppress weed growth. Additionally, my mentor provided me the opportunity to take on a variety of individual projects to strengthen my knowledge of weeds, native plants, soil, pollinators, and composting.

WHAT YOU LEARNED

- How to operate farm equipment (e.g. a sprayer, tractor, seed drill, and ATV)
- How to create a field map
- How to identify weeds and press weeds for a herbarium
- What Extension workers do within the community
- The qualities of different cover crops
- Some of the social dynamics at play within rural farming communities
- How to take soil samples, weed counts, and wheat samples
- How essential collaboration is within science

WHAT YOU DID

I started by filling the irrigation ditches in the field with leaves, woodchips, and a layer of soil. These areas, shown in red in Figure 1. were designated as pollinator strips where we used the PBSI Native Prairie Wildflower Mix.

Next, I mapped out a field map for two separate experiments, each with three blocks of equal size. The short-term experiment featured 12 plots per block measuring 12’ by 40’ while the long-term experiment had five plots per block measuring 24’ by 40’. After determining a map, we randomly selected which seeds would be planted in each plot. We took soil samples, using a soil probe, to assess the soil health before planting.

Due to the late planting date, we treated the field with a foliar herbicide, Mad Dog 5.4, at the start of June using an ATV with a mounted sprayer. We spot-treated 5 weeks later with a backpack sprayer. We seeded the field with a seed drill the first week of July, with the first visible growth occurring in mid-August. Pre-emergence hand weeding occurred weekly.

Images of the Field at White-Plumb Farm

HOW DOES THIS APPLY TO YOUR EDUCATION

This internship gave me a broad overview of a variety of different subjects, which gave me the background information to navigate my coursework confidently. It has also inspired me to pursue a Master’s degree to deepen my understanding of agronomy so I can work a similar job as my mentor, Kat Caswell.

ADDITIONAL PROJECTS

Herbarium:
Using a plant press, I collected and pressed different plant samples present at the various sites we visited throughout the summer. After identifying and drying the species, I glued them to acid-free herbarium paper. Each page was added to a portfolio with the intention of gradually building the collection over the next couple of summers.

Pollinator strip:
We seeded the areas where the soil was disturbed in the field with native wildflower seeds. The goal is to help the local pollinator population by providing them with more food sources. This strip will help with the establishment of beehives on-site in the coming years!

Compost demonstration:
I set up three ways of at-home composting on-site. This involved two manufactured on-the-ground compost containers, two manufactured barrel compost containers, and two stall composts made of wooden pallets, as shown in the image below. Along with the compost site, I created an informational poster to inform volunteers of how to maintain the compost within the correct C:N ratios.

NEXT STEPS

The project occurring at White-Plumb Farm Learning Center is an ongoing effort. The crops will need to be terminated prior to going to seed in the coming weeks. Soil samples at the end of the season will be necessary to determine the impacts of the cover crops. As the soil quality increases and more of the types of cover crops can successfully grow, we will be able to obtain more data on their ability to suppress weeds and fix nitrogen.