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Cover Crop Seeding Rates and their Effect on Soil Health and Crop Production

Introduction:

Cover crops benefit farmers in many ways.

By planting cover crops, farmers are increasing their soil's health for years to come by supplying it with nutrients, keeping out weeds, and leading to a better production season.

However, cover crop seed is expensive. The aim of this experiment is to test out different seeding rates of popular new England cover crops, oats and peas, to see how much seed is necessary to get the benefits of cover crops while minimizing cost to farmers in the northeast

Research Question:

If the recommended amount of cover crop seed mixture is planted, as well as varying amounts of cover crop seed, then how do the benefits of the cover crops change based on the differing levels of seed. The different benefits of the cover crops we want to measure are: overwinter weed control, soil protection, nitrogen dynamics, chlorophyll content in summer crops, and quality/quantity of summer crop.



Methods:

- Oats and peas were chosen for a few reasons. Both are very commonly planted in Massachusetts. They grow well in this climate zone and are both fast growers. They are both bountiful sources of biomass and harbor nitrogen from summer.
- In late August 2020, a mix of oats and peas were planted using a cone seeder. The 100% seeding rate consisted of 90 lbs of oats and 60 lbs of peas per acre, and the increments of each plot varied from 0% to 100% in 25% increments, and each plot was randomly assigned. There were 4 reps total.
- In addition to the different cover crop seeding rates, fertilizer was applied three times throughout the season at 100% the recommended rate, as well as 50%, and the sides which received 100% were randomly assigned. Each plot of each rep got either 50 or 100% on its leftmost and rightmost sides.
 - Cabbage was the crop of choice to measure the cover crops effect on crop production. Cabbage was transplanted in early May of 2021 into the plots. Before cabbage was planted, ground cover measurements were taken to measure overwinter weed suppression.
- Summer weed maintenance was of utmost importance and took up the most time. Soil tests were taken to measure nitrogen content through the season. SPAD tests were taken on the cabbage leaves once large enough, to measure chlorophyll content. And at the end of the season, cabbage weight was taken as well as some lab testing on nitrogen content of cabbage after dried.

Results/Conclusion

Due to the timing of this poster presentation, the results of this project are still being determined. As a café scholar, Raina's work will be continuing into the fall of 2021 where she will continue analyzing the results and will be able to conclude later.



Pictures:

(Left) Cabbage in the fields at the UMass research farm

(Right, top to bottom) Raina in the cabbage field, Raina presenting at the summer field day, Arthur presenting at the summer field day, And one more picture from the summer field day

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