Vicia villosa Interseed Trial

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Abstract

This experiment was designed to determine if *Vicia villosa* can form a beneficial symbiotic relationship with *Zea mays*. The goal is to have *Vicia villosa* produce and possibly store nutrients, so that the *Zea mays* is able to utilize the nutrients.

Introduction

Nitrogen has become a very expensive supplement to farming practices. *Vicia villosa* has the ability to produce around 4.0% of its mass as nitrogen. It also can hold nitrogen in the soil preventing nitrogen loss by leaching. Therefore by interseeding *Vicia villosa,* not only will it produce nitrogen, but act as a storage site for any applied nitrogen.

From research done in a previous year, data shows that seeding rates of five and fifteen pounds to the acre are not competitive for nutrients with *Zea mays* plants. My previous research showed that plots with vetch and no vetch showed no significant differences in yield of *Zea mays*. Therefore, the research completed this summer attempted to determine the seeding rate at which *Vicia villosa* became competitive with the *Zea mays* crop.

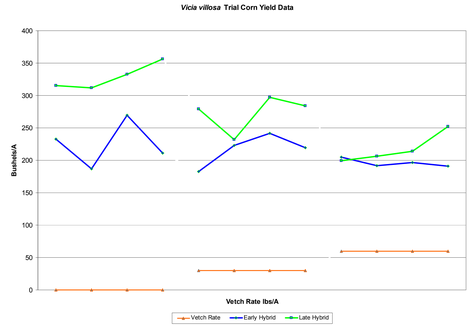
Materials and Methods

Treatments Year 1

Treatment 1.) *Zea mays* Hybrid 1 + *Vicia villosa* Rate A
Treatment 2.) *Zea mays* Hybrid 1 + *Vicia villosa* Rate B
Treatment 3.) *Zea mays* Hybrid 1 + *Vicia villosa* Rate C
Treatment 4.) *Zea mays* Hybrid 2 + *Vicia villosa* Rate A
Treatment 5.) *Zea mays* Hybrid 2 + *Vicia villosa* Rate B
Treatment 6.) *Zea mays* Hybrid 2 + *Vicia villosa* Rate C
Treatment 7.) *Zea mays* Hybrid 1 + *Vicia villosa* Rate A
Treatment 8.) *Zea mays* Hybrid 1 + *Vicia villosa* Rate B
Treatment 9.) *Zea mays* Hybrid 1 + *Vicia villosa* Rate C
Treatment 10.) *Zea mays* Hybrid 2 + *Vicia villosa* Rate A
Treatment 11.) *Zea mays* Hybrid 2 + *Vicia villosa* Rate B
Treatment 12.) *Zea mays* Hybrid 2 + *Vicia villosa* Rate C

Treatments Year 2

Treatment 1.) *Zea mays* Hybrid 1
Treatment 2.) *Zea mays* Hybrid 1
Treatment 3.) *Zea mays* Hybrid 1
Treatment 4.) *Zea mays* Hybrid 2
Treatment 5.) *Zea mays* Hybrid 2
Treatment 6.) *Zea mays* Hybrid 2
Treatment 7.) *Zea mays* Hybrid 1
Treatment 8.) *Zea mays* Hybrid 1
Treatment 9.) *Zea mays* Hybrid 1
Treatment 10.) *Zea mays* Hybrid 2
Treatment 11.) *Zea mays* Hybrid 2
Treatment 12.) *Zea mays* Hybrid 2



Vicia villosa was planted at the same time as *Zea mays* in early spring. Two different maturities of *Zea mays* were used and the *Vicia villosa* was planted at three different rates. The following year, *Zea mays* will be planted in the same area as the previous years' research to determine carryover effects of the *Vicia villosa.*

Data Recorded

Harvest Moisture, Harvest Test Weight, and bushels per acre were recorded for each plot.

Experimental Design

Split plot with hybrid maize maturity as the main plot and *Vicia villosa* seeding rates as the sub-plots. There were four replications.

Discussion

Average plot yields were 243 bu/acre. Average grain moisture content was 27% at harvest.

Analysis showed that there were significant differences in *Zea mays* yield between early and late maturity hybrids. The yield was significantly higher in the late maturity hybrid.

Analysis of the yields under different seeding rates of *Vicia Villosa* showed significant lower maize yields at rates B and C.

When *Vicia villosa* was added to the late maturity hybrid, the yield dropped significantly with increased seeding rates. In contrast, the early maturity maize showed no significant differences at the different seeding rates of *Vicia villosa*.

Conclusion

The first year of research shows a definite hybrid by seeding rate interaction. If *Vicia villosa* is to be interseeded with maize, the maize should be a shorter season hybrid to avoid yield loss.

Literature Review

Taylor, Erin, et al. (2008, December). Integrated Weed Management: Fine Tuning The System.

UC Davis (2009, January). UC SAREP Online Cover Crop Database, Hairy Vetch. Retrieved from http://www.sarep.ucdavis.edu/cgi-bin/ccrop.EXE/show_crop_21

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