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Corn Plant Populations

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Abstract

Corn hybrid genetics change yearly to increase productivity. The newer hybrids appear to possess plant characteristics that allow for higher plant populations. Over the past several years, field trials across the state have found support for higher plant populations in corn. This trial was designed to collect information to aid in local recommendations. Additionally, these data will be combined into a larger data set of similar trials for statewide recommendations.

Keywords

Agronomy

Disciplines

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Corn Plant Populations

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emergence application in mid-June. Grain yield was determined using a yield monitor.

Introduction

Corn hybrid genetics change yearly to increase productivity. The newer hybrids appear to possess plant characteristics that allow for higher plant populations. Over the past several years, field trials across the state have found support for higher plant populations in corn. This trial was designed to collect information to aid in local recommendations. Additionally, these data will be combined into a larger data set of similar trials for statewide recommendations.

Materials and Methods

The previous crop was soybean. The soil type is Monona silt loam with slope ranging from 5–14% slope. The trial was replicated four times with four seeding rates of the same corn hybrid. Seeding rates ranged from 26,197 to 41,549 seed/acre, based on the gear settings for the planter. However, due to planter malfunctions the 26,197 population was compromised and not included in the trial. Each plot was eight rows wide by the plot length, which was approximately 570 ft.

The trial had no fall or spring tillage and was no-till planted. The nitrogen fertilizer source was 135 lb N/acre of spring applied anhydrous ammonia. No phosphorus or potassium was applied. A pre-plant burndown herbicide application was used followed with a post-

Results and Discussion

Final plant populations ranged from 29,656 to 38,500. Final stands were 93 to 95% of the seeding rate, indicating good seed germination and growing conditions along with weak seedling disease pressure.

In 2008, average grain yields for the 31,162 and 36,082 populations were similar, but the 41,549 population yielded more than the others (Table 1). Although there was a numeric advantage for the higher population, all populations were statistically not different. The large numeric advantage for the higher populations is attributed to large variations in yields across the plot area.

Fall stalk nitrate samples were collected from the plots as an indication of nitrogen supply effect on population performance. All populations indicate that nitrogen supply was marginal (250 to 700 ppm N). Although there was no statistical difference, there is a slight trend that the higher population would benefit more from a higher rate of nitrogen.

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Table 1. Final plant population, grain yield and fall stalk nitrate test results from three corn seeding rates at the Western Research and Demonstration Farm.

| Seeding rate | Final plant population | Grain yield | Fall stalk nitrate test |
|-----------------------|------------------------|--------------|-------------------------|
| seeds/acre | plants/acre | bushels/acre | ppm |
| 31,162 | 29,656 | 185.9 | 848 |
| 36,082 | 34,188 | 181.7 | 919 |
| 41,549 | 38,500 | 208.7 | 487 |
| LSD _(0.05) | | ns | ns |