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Corn Plant Populations

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Abstract
Corn hybrid genetics change yearly to increase productivity. The newer hybrids seem to allow for higher plant populations because of certain plant characteristics. Over the past several years several 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, this data will be combined into a larger data set of similar trials for statewide recommendations.

Disciplines
Agricultural Science | Agriculture

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Introduction

Corn hybrid genetics change yearly to increase productivity. The newer hybrids seem to allow for higher plant populations because of certain plant characteristics. Over the past several years several 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, this data will be combined into a larger data set of similar trials for statewide recommendations.

Materials and Methods

The first year at the Western Research and Demonstration Farm was 2007. The previous crop was soybean. The soil type is Monona silt loam with the majority having 2–5% 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 geared setting for the planter. Each plot was eight rows wide by the plot length which varied from 510 to 669 ft.

The trial had no fall or spring tillage and was no-till planted. The nitrogen fertilizer source was 140 lb N/acre of urea-ammonium nitrate solution (28% UAN) applied pre-plant with a burndown herbicide application. No phosphorus or potassium was applied. In addition to the pre-plant herbicide application, a post-emergence application was applied in early June. Grain yield was determined using a yield monitor.

Table 1. Final plant population, grain yield and fall stalk nitrate test results from four corn seeding rates.

Seeding rate	Final plant population	Grain yield	Fall stalk nitrate test
seeds/acre	plants/acre	bushels/acre	ppm
26,197	28,387 d	174.3 a	655
31,162	32,139 c	163.8 ab	980
36,082	34,702 b	155.4 bc	358
41,549	39,266 a	145.8 c	382
$LSD_{(0.05)}$	2,047	16.9	ns

Results and Discussion

Final plant populations ranged from 28,387 to 39,266. The lower two seeding rates resulted in higher populations, indicating equipment error. However, the plant populations for the higher seeding rates declined indicating a germination loss plus equipment error of approximately 5%.

Grains yields decreased as plant populations increased. The lowest population yielded statistically more than the highest two populations. This drop in yield could be a result of soil moisture competition due to below normal precipitation in June and July. Across the trial corn grain yields varied from 110–189 bushels/acre.

Also, this trial, although not statistically significant, the higher two populations resulted in lower stalk nitrates compared with the lower populations.

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