

EFFECTS OF HIGHER THAN NORMAL CORN STAND DENSITY ON YIELD

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Year 2 of 3 year project

Justification:

Corn seeding rates in Missouri have increased during the past two decades. Previous studies performed in central Missouri have shown that grain yield often increases with increasing stand densities up to about 25,000 plants/acre, so farmers have benefited from increasing seeding rates.

Some farmers have asked if increasing stands to greater than 25,000 plants/acre would result in additional increases in yield. This experiment studies the yield potential of seeding rates as high as 38,000 kernels per acre.

Method:

A single corn hybrid, Dekalb DKC60-19, was planted at twelve seeding rates in 2,000 kernels/acre increments from 16,000 to 38,000 kernels per acre. Planting date was April 18, and plots were planted without tillage. Plots were 25 feet long and four 30-inch rows wide. The experimental design was a randomized complete block with five replications.

Pre-emergence herbicides were Dual II Magnum, Roundup WeatherMax, and Aatrex. One post emergence application of Roundup WeatherMax was made. Nitrogen fertilizer was top-dressed at 160 pounds/acre as ammonium nitrate. Plots were irrigated on three dates (July 1, July 18, and August 1) with about one inch of water on each date delivered by an overhead lateral irrigator.

Stand counts were made at about the 5-leaf stage, and stand densities were calculated. Before harvest the two center rows were end-trimmed to 20 feet. These two rows were harvested with a plot combine on September 6. Yield was corrected to 15% moisture.

Results:

The greatest yield occurred with a stand density of about 24,000 plants/acre (Figure 1). However, the optimum stand density was quite broad with no significant differences within the range of 18,000 to 34,000 plants/acre.

Less than one inch of rain occurred between the third week of June and the second week of August. High temperatures during early grain-fill were frequently over 90°. Although plots were irrigated, sufficient water was not applied to counteract the effects of little rainfall and high temperatures.

Effect of Stand Density on Corn Yield 2005; Columbia, MO

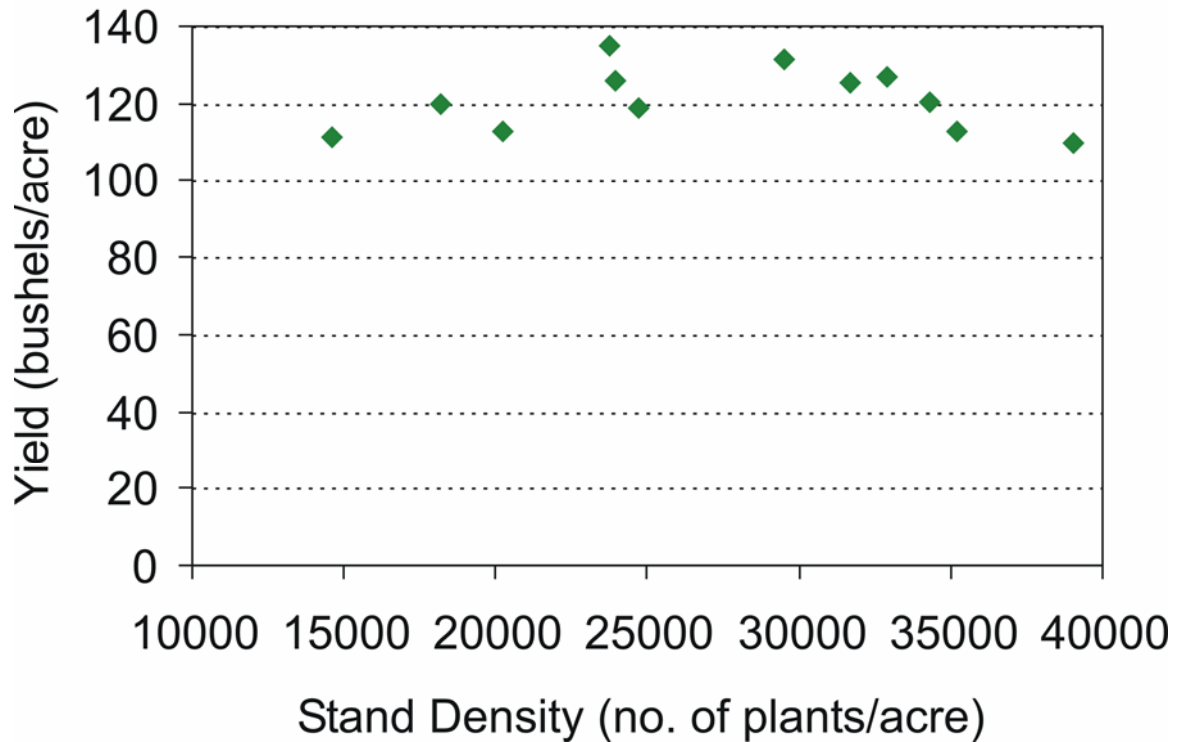


Figure 1. Effect of stand density on corn grain yield. Each point is the average of five replications for stand density and grain yield.

Conclusions:

1. No increase in yield occurred with stand densities above 24,000 plants per acre.
2. Dry and hot weather conditions probably affected response of corn yield to stand density.