

Optimal Planter Ground Speed in Corn Production

Chris Bruynis, Agriculture and Natural Resources Extension Agent

Objective

To determine the optimal corn-planter ground speed in a conventional tillage system.

Background

| | | | |
|----------------|---|----------------|---|
| Cooperator: | Dean Koehler | Fertilizer: | 190 lbs/A N, 92 lbs/A P ₂ O ₅ , 120 lbs/A K ₂ O |
| County: | Wyandot | Herbicides: | Axiom (18 oz/A) Atrazone Nine-O (2 lbs/A) |
| Nearest Town: | Upper Sandusky | Variety: | Bojac 509 |
| Soil Type: | Blount silt loam | Planting Date: | April 28, 2000 |
| Previous Crop: | Soybeans | Planting Rate: | 30,000 seeds/A |
| Drainage: | Surface, minimal tile | Row Spacing: | 30 inches |
| Tillage: | Conventional | Harvest Date: | November 7, 2000 |
| Soil Test: | pH 6.4, P 42 lbs/A, K 263 lbs/A, OM 2.3% | | |

Methods

A 16-row, 1998 John Deere 1770 vacuum planter was calibrated, adjusted for soil conditions, and used to plant the plot. Three different ground speeds were used – 4.5, 6, and 7.5 miles per hour. During calibration, the planter monitor indicated there was a reduction in seed drop during the higher ground speeds. Vacuum pressure was adjusted to correct for this problem.

Experimental design was a complete randomized block with three replications. Each treatment plot was 20-feet wide and 1,132 feet in length. Plant populations were counted nine and 17 days after planting to measure emergence differences. Yield was measured by a weigh wagon.

Results

Table 1. Corn Population and Yield.

| Ground Speed (mph) | 1st Population (plants/A) | 2nd Population (plants/A) | Yield (bu/A) |
|--------------------|---------------------------|---------------------------|--------------|
| 4.5 | 28,847 a | 29,814 a | 177.8 |
| 6 | 26,329 b | 27,879 b | 177.7 |
| 7.5 | 23,425 c | 26,910 b | 177.9 |
| F | 69.3 | 10.9 | <1 |
| LSD (0.05) | 1,280 | 1,755 | NS |
| CV | 2.20% | 2.70% | 1.20% |

Means followed by the same letter are not significantly different.

NS = Not Significant at P = 0.05.

Summary and Notes

Analysis of the data reveals that plant emergence from each planter speed was statistically different from each other for the nine days post-planting stand count. The 17-day post-planting count indicated that only the slowest ground speed was statistically different. Emergence differences are believed to be a result of seed placement and soil contact differences with slower ground speeds achieving more uniformity in both areas.

Field conditions during the growing season were generally good with adequate moisture. There was a little water stress early in the season but after full emergence of the crop. There was no noticeable difference in weed control in any of the replications with the entire plot obtaining excellent weed control.

Harvested yields were not significantly different from each other. Even though there were statistically significant differences in plant emergence, these differences had no statistical effect on the yield. Based on this research, when planting into a well-prepared seed bed and having a well-calibrated, mechanically sound planter, ground speeds between 4.5 mph and 7.5 mph have little or no effect on yields.

Acknowledgment

The author would like to thank the Farmers Commission Company for providing the weigh wagon.

For additional information, contact:

Chris Bruynis
The Ohio State University Extension
bruynis.1@osu.edu