Optimal Seeding Rate of Roundup Ready Soybeans

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Objective

To determine the optimal economic seeding rate for Roundup Ready soybeans.

Background

Cooperator:	Dean Koehler	Fertilizer:	None
County:	Wyandot		
Nearest Town:	Upper Sandusky	Herbicides:	Roundup Ultra (32 oz/A)
Soil Type:	Blount silt loam		
Previous Crop:	Corn	Variety:	Callahan 3505
Drainage:	Surface, minimal tile	Planting Date:	May 13, 2000
Tillage:	No-Till	Planting Rate:	See Methods
Soil Test:	pH 6.5, P 38 lbs/A,	Row Spacing:	9 inches
	K 233 lbs/A, OM 2.4%	Harvest Date:	October 11, 2000

Methods

With seed cost differences between Roundup Ready seed and traditional soybean seed, the importance of seeding rate has increased. Higher than necessary seeding rates impact profitability. A 30-foot John Deere Air Seeder with seed monitors was used for planting into corn stubble. The three targeted seeding rates were 100,000, 150,000, and 200,000 seeds per acre. Experimental design was complete randomized block with four replications. Each of the treatment plots was 30 feet wide and 494 feet in length. Yield was measured by a weigh wagon.

Results

Table 1. Corn Population and Yield.

Target Population (plants/A)	Harvest Population (plants/A)	Yield (bu/A)
100,000	98,252 a	46.4 b
150,000	144,716 b	49.3 a
200,000	175,934 c	49.6 a
F	33.1	10.6
LSD (0.05)	23,506	2.4
CV	9.70%	2.20%

Means followed by the same letter are not significantly different.

Summary and Notes

Analysis of the data reveals that each harvested population range is statistically different from each other. Harvested yields of the two highest plant populations were not significantly different from each other. The lowest population yield was significantly lower than the higher two planting rates.

Field conditions during the growing season were generally good with adequate moisture. There was a little water stress early in the season. There was no noticeable difference in weed control in any of the replications with the entire study having excellent weed control.

The economic difference among the three treatments, assuming a $5.40 value for soybeans (includes Loan Deficiency Payment) and a $22.00 cost for seed beans (50-pound bag @ 2,800 seeds per pound), and using 150,000 seeds per acre as optimum, is as follows:

Seeding Rate (seeds/A)	Difference in Seed Cost ($/A)	Difference in Sales ($/A)	Net Difference (profit/A)
200,000	+7.85	0	$ 7.85 less
100,000	-7.85	16.17	$ 8.32 less

According to these results, growers can have a profitability change of $8.00 per acre by choosing the correct seeding rate for Roundup Ready soybeans. For a grower producing 500 acres of soybeans, this would result in additional income of $4,000 for reducing seeding rate from 200,000 per acre to 150,000 per acre. These differences are based on one location and one growing season. Additional sites and years of data will better define the optimal plant population for Roundup Ready soybean profitability.

Acknowledgment

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