Non-Irrigated Soybean Population Study

Study ID: 0510147202402
County: Richardson
Soil Type: Nodaway silt loam
Planting Date: 5/29/24
Harvest Date: 10/14/24
Population: Variable
Row Spacing (in): 15”
Hybrid: Pioneer® P37A18E
Reps: 6
Previous Crop: Corn
Tillage: No-till
Herbicides: ***Pre:*** 8 oz/ac Authority Supreme® + 21oz/ac glyphosate + 12.8oz/ac Zaar ® + 16oz/ac 2,4-D ***Post:*** 32oz/ac Enlist One® + 24 oz/ac glyphosate + 2.5 pt/ac Warrant® + 12.8 oz/ac clethodim + 12.8 oz/ac Zaar®

Seed Treatment: Pioneer® Seed Treatments
Foliar Insecticides: 1.5 oz/ac Province II® + 1.5oz/ac Brigade® applied at R3 with fungicide
Foliar Fungicides: 3 oz/ac propiconazole + 3 oz/ac Priaxor®
Fertilizer: March variable rate of 45 lb MAP/acre + 96 lb potash/acre + 52 lb gypsum/acre
Irrigation: None
Rainfall (in):

Introduction: Finding the optimal soybean seeding rate may vary from field to field. The goal of this study was to find the optimal seeding rate between three target amounts: 80,000 seeds/ac, 110,000 seeds/ac, and 140,000 seeds/ac. Yield/ac was gathered from a yield monitor and cleaned to adjust for any outliers. Six replications were done in this study.

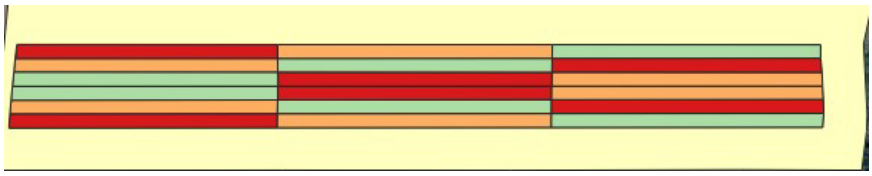

Figure 1: Project Design and Layout. Red plots are 80,000 seeds/ac, orange plots are 110,000 seeds/ac or 130,000 seeds/ac, and green plots are 140,000 seeds/ac.

Results:

Target Population	Yield (bu/ac)†	Marginal Net Return‡ ($/ac)
80,000 seeds/acre	66 B*	656 B
110,000 seeds/acre	71 A	701 A
140,000 seeds/acre	72 A	703 A
P-Value:	0.004	0.04

*Values with the same letter are not significantly different at a 90% confidence level
† Bushels per acre are corrected to 13% moisture
‡ Marginal Net Return based on $11/bu soybeans, $91.03/ac cost for 140,000 seeds/ac, $75/ac cost for 110,000 seeds/ac, and $58.03/ac cost for 80,000 seeds/ac.

Summary:

- There were significant differences in yield and marginal net return among the treatments.
- Yield was highest when planting at 110,000 seeds/ac (71 bu/ac) and 140,000 seeds/ac (72 bu/ac) compared to planting at 80,000 seeds/ac (66 bu/ac)
- Marginal net return was highest when planting 110,000 seeds/ac ($701/ac) and 140,000 seeds/ac ($703/ac) when compared against planting 80,000 seeds/ac ($656/ac).