

Effect of Potassium Applied on R3 Soybeans in a Modified Relay Intercrop System

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Objective

To evaluate grain yield response of modified relay intercropped soybeans to potassium applied at soybean growth stage R3.

Background

Crop Year:	2013	Row width:	10 inches
Location:	OSU Unger Farm	Fertilizer (lbs N-P-K):	95-58-78
County/Town:	Crawford	Soybean Planting Date:	June 5, 2013
Soil Type:	Blount/Pewamo (silt loam)	Soybean Variety:	Pioneer P93Y24
Drainage:	Systematic	Seeding Rate:	225,000 seeds/acre
Previous Crop:	Wheat	Herbicide (Post):	1 qt glyphosate (7/22)
Tillage:	No – tillage	Treatment Dates:	July 26, 2013
Soil Test:	pH 6.2, P 34 ppm, K 152 ppm	Date of Harvest:	October 29, 2013
SCN Count	(MRI area) 1160 eggs/100cc	Rain fall:	25.57 inches (5/16-10/2)

Methods

Soybeans were interseeded into standing wheat with 10 inch row spacing on June 5, 2103 with a Great Plains 2010P precision drill mounted on a 3 point hitch with lift assist wheels. Pioneer P93Y24 were planted at a rate of 225,000 seeds per acre. Wheat was harvested on July12, 2013. Wheat averaged 70 bushel per acre in the field. An application of 1 quart of glyphosate was applied on July 22.

This study used a randomized complete block design with two treatments replicated 4 times to compare the treatment yield effect of potassium (0-0-60) applied at 150lbs/acre (90 lbs./K₂O) and a control (no potassium). Plots were treated on July 26, 2013 when soybeans were in the R2- R3 growth stage. Plots were trimmed to 41 feet in average length. Plots were harvested on October 29, 2013 using a Kincaid 8-XP small plot combine harvesting the center five feet of each plot.

Treatment 1

- 1) Potassium (0-0-60) at150 lbs/acre (90 lbs/K₂O)
- 2) Control (no potassium)

Results

Table 1. MRI soybean yield (adjusted to 13.5% moisture)

Treatment	Mean yield (bu/acre)
Potassium	54.8
Control	55.2

F=.08, NS; Prob>F=.79; CV =3.52

Summary

This study was conducted at OSU Unger Farm in north central Ohio where Modified Relay Intercropping (MRI) is practiced. In 2013 there was a not a significant difference in soybean yield observed between the potassium application and the control. The cost of the potash at time of application was 470.00/ton or 35.25 for the 150lb rate per acre. To break even at this cost with 12.87 (10-29-13) cash price for soybeans, a yield increase of 2.7 bushels would be needed to recover fertilizer cost. By the Tri-State Fertility Recommendations, potassium soil test levels were in maintenance range and response to added K would not be anticipated (CEC from soil test: 9.5 and K: 140 ppm).

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