Potash Fertilizer Rate Study on Soybeans

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Objectives

The objective of this study was to evaluate the effect of different rates of potash fertilizer on soybean yields.

Background

Soil Type:	Hoytville silty clay loam, Haskins loam	Herbicide: POST(June 26):	22 oz/A Round up WeatherMax + 17 lb/100 gallons AMS
Drainage:	Tile- nonsystematic		
Previous Crop:	Corn		
Tillage:	No-till	Variety:	Wellman W3635RR (3.5 RM)
Soil Test (2005):	pH 6.5, P 47 ppm, K 126 ppm	Row width:	7.5 inches
Fertilizer:	See Methods	Planting Rate:	225,000 seeds/A
Herbicide: EPP(April 22):	6 oz/A Define SC + 6 oz/A Sencor + 16 oz/A Roundup OriginalMax + 17 lb/100 gallons AMS	Planting Date:	May 24, 2006
		Harvest Date:	November 4, 2006

Methods

This study was set up with three different rates of potash fertilizer replicated four times within the field in a complete randomized block design. The potash treatment rates were:

1.) 0 pounds/acre potash
2.) 60 pounds/acre potash (100 pounds/acre 0-0-60)
3.) 120 pounds/acre potash (200 pounds/acre 0-0-60)

The potash was applied using a commercial broadcast spreader with a spreading width of 50 feet. All applications were applied on February 13, 2006 using muriate of potash (0-0-60) as the K_2O source. An early spring application was made only because ground conditions in the fall were not suitable for having the application equipment in the field.

Plot size was 60 feet wide by 1,030 feet long. Yield data was collected by harvesting the center 29 feet (one combine round) of each plot. Grain weights were measured with a weigh wagon, and grain moistures were taken from the combine yield monitor. Yields are adjusted to 13% moisture. Harvest populations (October 14) were estimated by counting the number of plants in a row on each side of a 10-foot section at three locations in each plot. The average number of plants counted per 10 feet was converted to plants per acre.

Results

Table 1. Harvest population, moisture, and yield means for each treatment.

Treatment	Harvest Population	Moisture	Yield
	(plants/A)	(%)	(bu./A)
0 lb/A potash	212,300	12.4	63.8
60 lb/A potash	209,700	12.5	64.1
120 lb/A potash	200,700	12.5	64.2
LSD (P=0.05)	NS	NS	NS
F-test	<1	1.3	1.3
CV (%)	7.2	<1	<1

NS= not significant

Summary

The results from this one year study show no statistical differences between treatments for harvest population, moisture, or yield. According to the Tri-state Fertility Recommendations bulletin #E2567 published by Michigan State, Ohio State, and Purdue universities jointly, soil tests pulled on this field in the fall of 2005 indicated potassium levels to be within a range requiring only maintenance levels of potash to be applied, meaning the field was not low on potash to begin with. Maintenance level recommendations for this field called for 110 lb/A of potash based on potassium level (K= 126 ppm) and the cation exchange capacity (CEC= 13.7 meq/100g) of the soil.

This study would tend to indicate that with potassium levels within this maintenance range in a field, reducing the amount of potash fertilizer applied may not have a short term immediate effect on yield. The effect will more likely show up in future years if a continued draw down of potassium below critical levels is created by under applying potash to the field on a continuous basis.

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