Liquid Potassium Fertilizer for Soybeans

(Final Report)

Purpose:

Potassium (K) is an important nutrient for soybean development. After Nitrogen, K is the most heavily absorbed nutrient in soybeans. A large portion of potassium is stored in the soybean seed and is therefore removed from the field each year at harvest. Potassium deficiency can severely limit soybean yield potential; deficiencies can also lower disease resistance and impact nodule formation.

This project was set up to assess if added liquid potash fertilizer can increase soybean yields and reduce deficiencies by providing an easily accessible source of potassium. The project also evaluated what soil types would have the greatest responses based on the existing soil test levels.

Figure 1. Soybean leaf showing Potassium (K) deficiency.

Methods:

Data was collected at 15 sites over 3 years. Two trials were conducted in 2010, seven trials in 2011 and six in 2012. These trials were across a variety of locations, soil types, tillage systems and soil test levels. Plots were planted with a Kearney 15” vacuum planter with John Deere 7000 planter units; the fertilizer was applied in furrow using Keaton seed firmers during planting. Each plot was a minimum of20 feet wide by 1000 feet long. Some sites were planted by farmer co-operators using the same protocol.

Results:

Table 1: Soil Sample Data at 15 Liquid Starter Fertilizer Trials (2010-2012)

Location	Year	Key Soil Parameters		
		pH	P	K
Lucan	2010	7.7	14	134
Stratford	2010	7.2	47	200
Stratford	2011	7.5	46	178
Bornholm	2011	7.6	25	81
North Pelham	2011	6.3	9	54
Monkton	2011	7.7	27	137
St. Thomas	2011	7.5	12	138
St. Thomas	2011	7.3	6	93
Plattsville	2011	7.1	29	63
Plattsville	2012	6.8	39	117
Foldens	2012	6.1	47	221
Orangeville	2012	7.1	16	86
Canfield	2012	6.7	32	189
Lucan	2012	7.8	31	157
Varna	2012	7.8	7	52

Table 1, specifies the soil test values for pH, phosphorus (P), and potassium (K) at each of the trial locations. A variety of soil test values were used for the experiment to asses if 2-20-18 liquid fertilizer could provide a yield benefit under varying situations.

Table 2: Average Response of Soybeans to 2-20-18 Fertilizer at 15 Sites in Ontario (2011-2012)

Treatment	Average Yield Across 13 Sites (bu/ac)	Average Yield Advantage (bu/ac)	LSD (5%)
Untreated	51.3	-	a
3 gal. 2-20-18	51.7	0.4	a

Table 2 shows the average yield of the untreated check and the treatment of 3 USGal/ac of 2-20-18 liquid fertilizer. The two treatments did not show a statistical difference over the 3 years of the trial.

Only one location, Lucan in 2010, showed a statistical response to the liquid fertilizer. The response does not appear to be tied to a “low” K soil test value, as the soil test showed a value of 134 ppm K. The response at this site was significant, at 5.5 bu/ac.

Summary:

The liquid fertilizer 2-20-18 was tested in soybeans at various locations, which had different soil types, geography, and soil test values. This study was conducted over 3 years, at 15 locations. There was only one site which responded significantly to this fertilizer treatment. On average there was no statistically significant response to the added expense of this fertilizer.

Next Steps:

This is the end of a three year study. The results from this study will be used in various presentations and reports. New liquid fertilizer products may be tested in the future as they become available.

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