

Foliar Feeding Soybeans

Purpose:

Some nutrient deficiencies are easily identifiable because of their distinct symptomology. For instance potassium (K) deficiency leaf symptoms are very distinct from manganese (Mn) deficiency. See picture #1 and #2. A micro nutrient deficiency such as Mn can be corrected through foliar feeding with the expectation of a significant yield response. However, is it possible that the plant is suffering from a lack of nutrients in the absence of obvious visual symptoms during certain times of the growing season? For instance dry conditions during August may inhibit nutrient uptake or nitrogen fixation just at the very time the plant needs the most nutrients. This project tested various foliar feeding products as well as Priaxor foliar fungicide to assess if these products, including in-season nitrogen application could significantly increase soybean yields. These trials were set up in fields with no obvious visual nutrient deficiencies and adequate soil test values. Fields were well nodulated.

Figure 1. Potassium (K) deficiency in soybeans is characterized by yellowing around the leaf margins.



Figure 2. Manganese (Mn) deficiency is characterized by pale green leaves with dark leaf veins.



Methods:

The treatment list was as follows:

1. Untreated (Control)
2. ManZinPhos Max Plus (1.0 L/ac) applied at V4
3. Priaxor Fungicide + KP Plus applied at R2
4. TruPhos (0.67 L/ac) applied at R4
5. Mn @ 0.8 L/ac applied at V4 (YaraVita Glytrel MnP)
6. Streamer applied urea* dissolved in water at R3
7. Flat Fan applied urea* dissolved in water at R3

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*4.5 lbs of urea was dissolved in 1 US gallon of water and the mix was applied at rate of 20 US gallons/acre. (41 lbs/acre of N)

Two locations were established in 2014 at Bornholm (Perth county) and Lucan (Middlesex county). Treatments were randomized 3 times.

Figure 3. Streamer nozzle application of dissolved urea on soybeans at R3.



Soybean trials were planted using a 15" Kearney Custom John Deere planter. Foliar fertilizer applications were made at the soybean plant stages indicated in the treatment list using a 3 point hitch Hardi sprayer. Streamer nozzles were only used for treatment #6.

Results:

Table 1 reports the average yields and response to the various foliar feeding treatments applied at the two trial locations in 2014. Although there was a positive numeric yield response to a number of treatments none of the treatments were statistically different from the untreated control. There was a slight negative yield response where foliar urea was applied likely due to leaf burn although these differences were not statistically significant.

Summary:

1. Foliar applications of nitrogen, phosphorus, potassium, and manganese did not provide additional yield in these trials. Please note that these fields did not show obvious nutrient deficiency symptoms. Other trials have shown an application of Mn in deficient fields will increase yields.

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Table 1. Soybean Yield Response to Foliar Feeding at Various Plant Development Stages in 2014.

Trt #	Treatment Name	Average Yield by Location (bu/ac)		Average Yield Across Locations (bu/ac)
		Perth	Lucan	
1	Untreated Control	58.8	37.5	48.2 ab
2	ManZinPhos (V4)	60.8	40.3	50.6 a
3	Priaxor + KP Plus (R2)	60.7	40.9	50.8 a
4	TruPhos (R4)	62.2	39.2	50.7 a
5	Mn 0.8 L (V4)	59.2	39.2	49.2 ab
6	Streamer dissolved urea	58.6	36.5	47.6 ab
7	Flat fan dissolved urea	56.6	36.3	46.4 b

2. A manganese, zinc, boron and molybdenum super-complex foliar application did not increase yields. (ManZinPhos)
3. Negative yield responses were observed in treatments containing high levels of urea. This may be associated to “leaf burn” caused by high nitrogen concentrations.

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