



Permanent Plots - Soybeans (20-715)

Experiment Info:

Planted:	5/25/2020
Harvest:	10/10/2020
Yield Goal:	bu/A
Target Fert.:	
Variety:	P20T64E
Population:	140,000
Row Width:	15
Prev. Crop:	Corn
Plot Size:	15 x 210
Replications:	4

Soil Test Values (ppm):

pH:	7
CEC:	12.4
%OM:	3.4
Bray P1:	25
Bicarb P:	
K:	111
S:	5
%K:	2.3
%Mg:	21.4
%Ca:	75.9
%H:	0
Zn:	1.5
Mn:	4
B:	0.7

Objective:

To track Yields of different fertilizer programs in a soybean-corn rotation over multiple growing season to measure sustainability.

Beginning in 2011, a long-term experiment in a corn-soybean rotation was developed to evaluate fertilizer program effects on yields over time. There are two adjacent test sites where the corn and soybeans are grown in rotation. Five main fertility programs were evaluated in the soybean year with rotation to a corresponding corn treatment. These are: 1) No Fertilizer. 2) AgroLiquid planter application of Sure-K + Micro 500; 3) AgroLiquid foliar application of Sure-K + Manganese at the V4 stage. 4) Low rate potash (0-0-62) applied in the fall after soybean harvest. The Low-Rate Potash matches the amount of K₂O in planter Sure-K applications. 5) and 6) Conventional: 200 lb/A of Muriate of Potash (0-0-62) applied in the fall after soybean harvest for the next corn and soybean crops.

Note: 5 gal/A Sure-K in these 15" rows is higher than is recommended in 30" rows.

Fertilizer Program Effects on Yield of Soybeans in 15" Rows											
Programs applied to the same plots in a corn-soybean rotation											
Trt	Program	Fertilizer Rates per Acre and (Placement)									
1	No Fertilizer										
2	AgroLiquid planter	5 gal Sure-K + 1 qt Micro 500 (In Furrow)									
3	AgroLiquid Foliar	3 gal Sure-K + 2 qt Manganese (Foliar V4)									
4	Low Rate Potash	20 lb 0-0-62 (Fall after soybeans)									
5	Potash	200 lb 0-0-62 (Fall after soybeans)									
6	Potash	200 lb 0-0-62 (Fall after soybeans)									

Soybean Yield By Year: Average Bu/A											Extra Bu/A	
Trt	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Avg	over 10 yrs.
1	70.3	81.8	61.4	61.1	68.1	72.2	63.4	75.5	59.6	78.0	69.1	
2	79.0	90.3	66.0	65.9	70.4	84.3	70.0	77.5	65.4	83.4	75.2	61.2
3	75.8	87.8	71.6	66.7	70.4	86.1	69.9	75.7	66.8	85.2	75.6	65.0
4	76.0	85.6	63.4	63.8	68.3	82.1	66.2	78.5	63.9	82.7	73.0	39.5
5	73.1	83.6	63.2	65.9	68.5	85.1	68.4	82.3	65.5	88.0	74.4	52.6
6	72.9	84.0	64.1	64.9	67.3	83.3	66.8	84.2	63.1	90.0	74.1	49.7
avg:	74.5	85.5	65.0	64.7	68.8	82.2	67.4	79.0	64.1	84.6	73.6	

10 year treatment LSD(0.1): 2.1; CV: 14.3

Conclusions:

- This particular field produced excellent soybean yields over the 10 years of the test, even the No Fertilizer check. But there was an extra 65 bushels per acre produced over the 10 years with the AgroLiquid foliar treatment. This is like an extra crop year.
- For 10 years, AgroLiquid planter and foliar yields were essentially identical, showing that a well-timed foliar application of what is needed by the plant can be effective.
- The report on Ten Year Soil Test (20-715) showed that soil test levels dropped equally for all treatments as Yield exceeded applications. High yields are maintained. But there may be finally a start of a yield drop where no potash is used even though soil tests are similar.