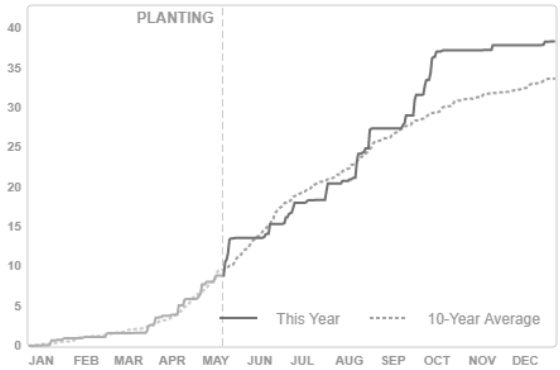
Multi-Hybrid Planting for Spatial Soybean Seed Treatments

Study ID: 546155201701
County: Saunders
Soil Type: Filbert silt loam, Fillmore silt loam, Judson silt loam, Pohocco-Pahuk complex, Tomek silt loam, Yutan silty clay loam
Planting Date: 5/15/17
Harvest Date: 10/18/17
Population: 140,000
Row Spacing (in): 30
Variety: NK34-P7
Reps: 24
Previous Crop: Corn
Tillage: No-Till

Seed Treatment: None, other than those being studied
Irrigation: Pivot
Rainfall (in):



Introduction: Sudden Death Syndrome (SDS) is caused by the soil borne fungus *Fusarium solani f. sp. glycines*. While this is a relatively new disease for Nebraska soybean farmers, there are several locations in the state where significant percentages of fields are being affected. In fields where SDS is present and soybean cyst nematode is also present, the disease can be more severe. There are not clear guidelines to determine at what point a field will have enough increase in yield to justify treatment and, therefore, on-farm research projects like this one are needed.

GROUP 7 FUNGICIDE

A systemic seed treatment for use on soybean for the protection against damage caused by early season plant pathogenic nematodes. As a soybean seed treatment provides protection from seedling infections by *Fusarium virguliforme*, the causal agent of Sudden Death Syndrome.

ACTIVE INGREDIENT:	
FLUOPYRAM: *N*-[2-[3-chloro-5-(trifluoromethyl)-2-pyridinyl]ethyl]-2-(trifluoromethyl)benzamide*	48.4%
OTHER INGREDIENTS:	51.6%
Contains 5 lbs FLUOPYRAM per gallon (600 g FLUOPYRAM per liter)	**TOTAL: 100.0%**

*(CAS Number 658066-35-4)

EPA Reg. No. 264-1167

Product information from: *http://www.agrian.com/pdfs/ILeVO_Label1.pdf*

ILeVO® is a seed treatment marketed by Bayer CropScience for SDS and also has nematode activity (label at right). This field was selected due to the presence of SDS in the 2014 soybean crop. Two treatments were selected to test the efficacy of the ILeVO® seed treatment.

A: Standard soybean treatment (for this study Cruiser Maxx®)

B: Standard soybean treatment plus ILeVO at a rate of 1.18 fl oz/140,000 seed unit

The additional capabilities of the multi-hybrid planter allow for site specific application of ILeVO in the portions of the field that historically show the effects of SDS. This site specific application of ILeVO can reduce input costs while still effectively managing SDS pressure.

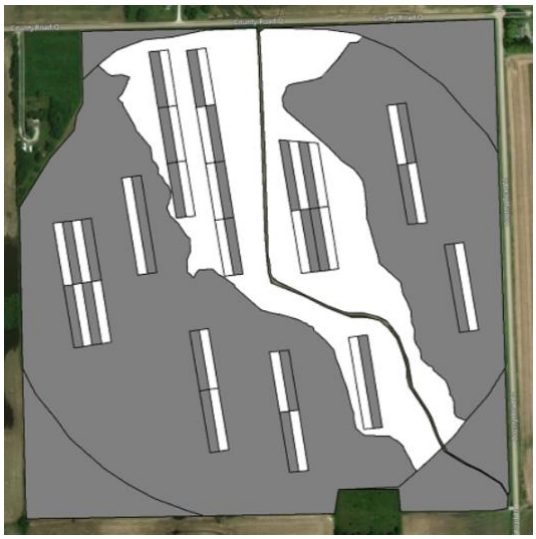


Figure 1. Zone prescription for soybean treated with standard treatment (dark grey) and ILeVO (light grey).

Management Zone Creation: Historical yield data was used to cluster data into management zones representing distribution of SDS in the field. (*Figure 1)*. These zones were assessed for SDS disease levels and final yield results.

Results: Within each zone, check strips of the opposite seed treatment were established for evaluation. Data were analyzed using the GLIMMIX procedure in SAS 9.4 (SAS Institute Inc., Cary, NC). Mean separation for treatment within a zone was performed with Fisher's LSD. Letters below apply for differences within a zone.

Treatment	Standard Treatment + ILeVO®	Standard Treatment	P-Value
	***Yield** (bu/ac) †*		
SDS Zone	67 A*	57 B	0.0003
Standard Zone	70 A	70 A	0.849
P-Value	0.9631	0.9494	
	***Marginal Net Return** ($/ac)‡*		
SDS Zone	608.19	529.75	
Standard Zone	637.60	651.57	

*Values with the same letter are not significantly different at a 95% confidence interval.
†Bushels per acre corrected to 13% moisture.
‡ Marginal Net Return based on $9.25/bu soybeans, $15.17/acre ILeVO seed treatment cost ($10.19/oz).

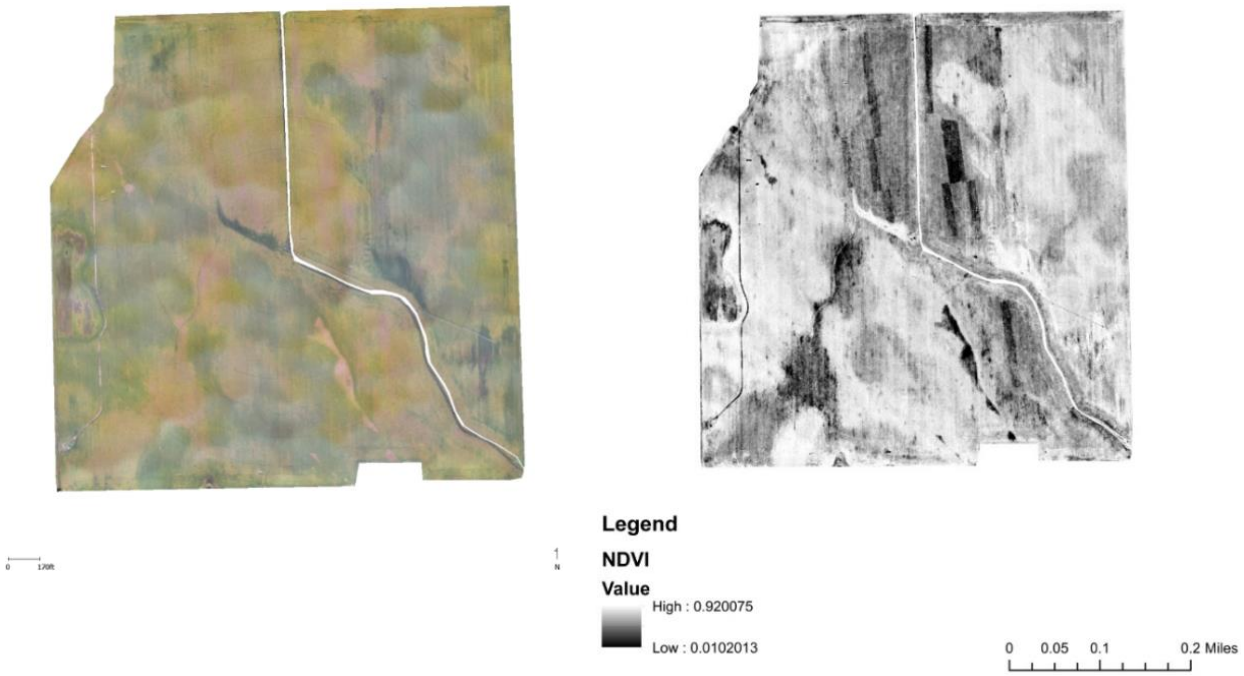


Figure 2. RGB (left) and NDVI (right) imagery of the field area.

Aerial imagery was obtained in late August *(Figure 2).* True color (RGB) imagery shows some of the standard zone check strips in the SDS zone at the north end of the field. NDVI (normalized difference vegetative index) imagery distinctly shows the standard treatment strips within the SDS zone that had higher levels of SDS.

Summary: The standard + ILeVO treatment yielded higher than the standard treated seed in the SDS zone. There was no difference in treatments in the standard zone. The drastic yield difference between the ILeVO and standard treatment in the SDS zone resulted in a $79 advantage for using the ILeVO treatment. Considering the size of the SDS zone (around 50 acres), the additional return by using the ILeVO treatment would equal around $4,000 for the field. If the additional cost of a multi-hybrid planter is around $20,000, the technology could be paid off in around five soybean growing seasons in this field.

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