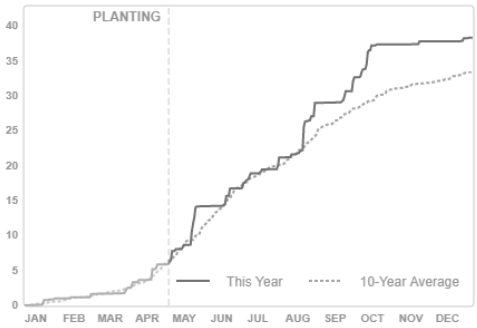
Multi-Hybrid Planting for Spatial Soybean Seed Treatments

Study ID: 180155201701
County: Saunders
Soil Type: Nodaway silt loam, Tomek silt loam, Yutan silty clay loam, Yutan, eroded-Aksarben silty clay loams, Yutan, eroded-Judson complex
Planting Date: 4/28/17
Harvest Date: 9/29/17, 10/06/17, 10/12/17
Population: 160,000
Row Spacing (in): 15
Variety: Pioneer 31T11
Reps: 18
Previous Crop: Corn
Tillage: Conventional 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

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 Evergol Energy (0.5 fl. Oz/unit), Gaucho (0.80 fl. Oz/unit), PPST2030 (1 fl. Oz/unit), Allegiance (0.28 fl. Oz/unit), PPST120+ (1 fl. Oz/unit))

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

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.

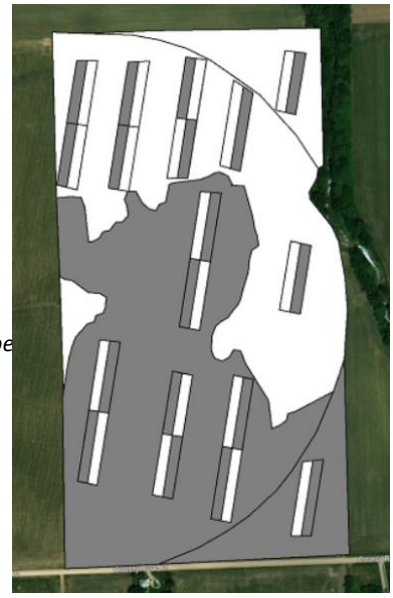


Figure 1. Zone prescription for soybean treated with standard treatment (dark grey) and ILeVO (light grey).

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.

Foliar disease symptoms were assessed using Southern Illinois University at Carbondale's Method of SDS scoring. The disease symptoms were assessed using a 1 to 9 scoring system, with a score of 1 indicating the least symptoms and 9 indicating premature death. In addition, the overall incidence of affected plants was determined. These two scores were combined to create the disease index. The disease index = disease incidence x disease severity/9. Disease assessments were conducted on September 7, 2017.

	Disease Index on a Zone Basis		**Disease Index on a Whole Field Basis**
Treatment	**SDS Zone**	**Standard Zone**	**Disease Index**
Standard Treatment + ILeVO®	1.87 A*	0.07 A	0.97 A
Standard Treatment	6.47 A	2.43 A	4.45 B
P-Value	0.1145	0.0553	0.0212

Treatment	**Standard Treatment + ILeVO®**	**Standard Treatment**	**P-Value**
	***Yield** (bu/ac)†*		
SDS Zone	70 A	67 A	0.108
Standard Zone	79 A	78 A	0.453
P-Value	0.9631	0.9494	
	***Marginal Net Return** ($/ac)‡*		
SDS Zone	633.33	621.71	
Standard Zone	711.51	718.60	

*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).

Summary: There was no difference between the standard + ILeVO versus standard treated seed in the SDS or standard zone. Disease ratings indicate no difference in disease on a zone basis. When considering the disease levels across the whole field, the ILeVO treatment had significantly lower disease levels than the standard treatment. All disease observations recorded are considered low disease levels.

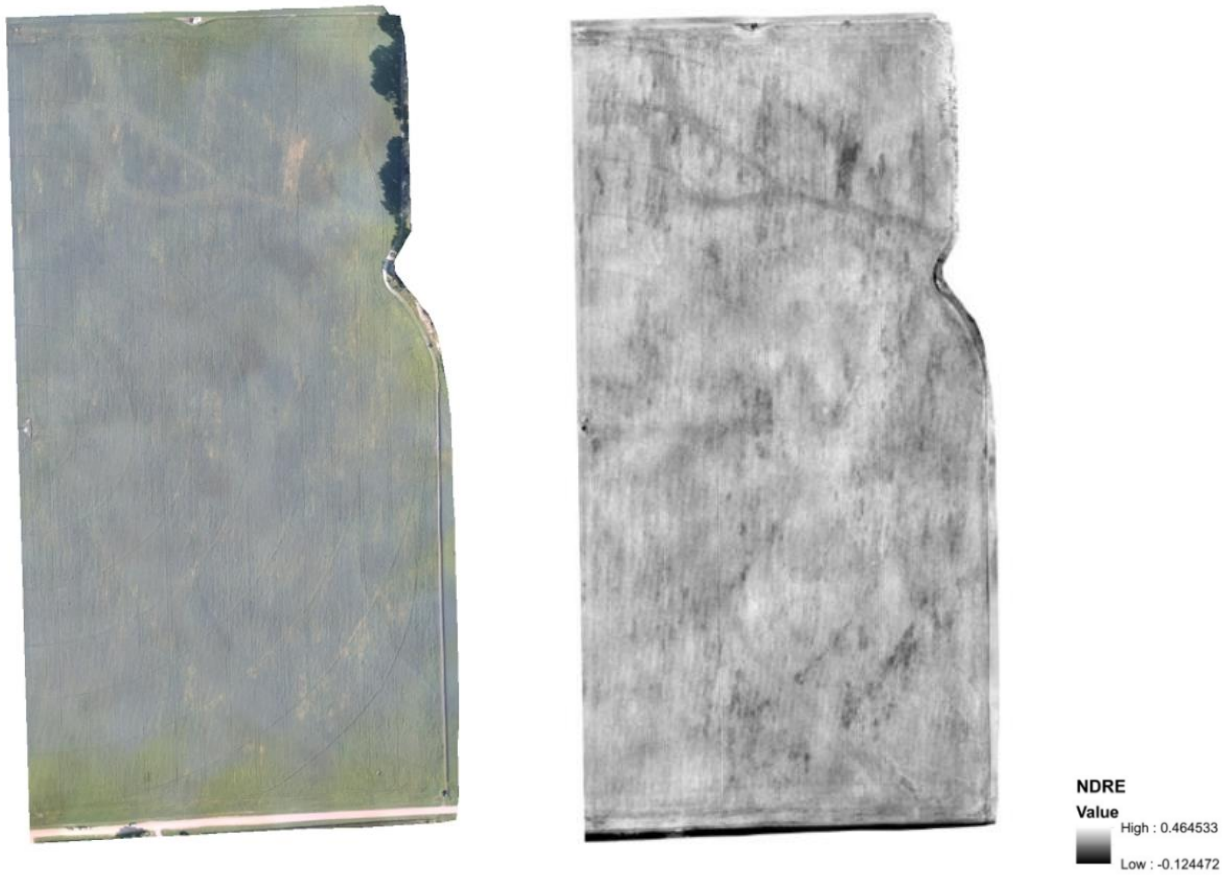


Figure 2. RGB (left) and NDRE (right) imagery of the field area.

Aerial imagery was obtained in late August *(Figure 2).* Both true color (RGB) imagery and NDRE (normalized difference red edge index) imagery show some of the standard zone check strips in the SDS zone at the north end of the field.

This study sponsored in part by: Bayer CropScience LP