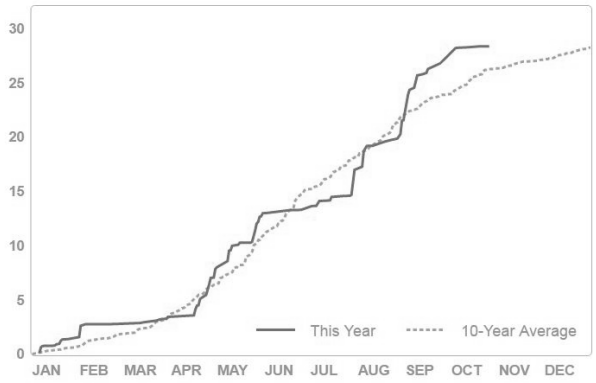
ILeVO® Seed Treatment for Sudden Death Syndrome

Study ID: 606035201601
County: Clay
Soil Type: Hastings silt loam; Butler silt loam; Crete silt loam
Planting Date: 5/5/16
Harvest Date: 9/30/16
Population: 160,000
Row Spacing (in): 30
Hybrid: Fontanelle 29N04
Reps: 4
Previous Crop: Corn
Tillage: Disked 4/16/16
Herbicides: ***Pre:*** 32 oz/ac Roundup® and 4.5 oz/ac Authority® First on 5/6/16

Fertilizer: 160 lb/ac 11-52-0
Irrigation: Pivot
Rainfall (in):



Soil Sample Results:

ID	Soil pH 1:1	Modified WDRF BpH	Soluble Salts 1:1 mmho/cm	Excess Lime Rating	FIA Nitrate ppm N	Nitrate Lb N/A for 0-8 in	M-P3 ppm P	----Ammonium Acetate--- ----------ppm----------				Sum of Cations me/100g	% Base Saturation				
								K	Ca	Mg	Na		H	K	Ca	Mg	Na
Rep 1	6.3	6.9	0.32	None	16.0	38	63	470	2142	242	49	14.9	5	8	72	13	2
Rep 2	6.4	7.0	0.31	None	11.9	28	30	516	2478	410	52	18.1	4	7	69	19	1
Rep 3	6.4	7.0	0.29	None	16.0	38	57	465	2397	369	46	17.4	5	7	69	17	1
Rep 4	6.2	6.8	0.19	None	15.2	37	54	506	2340	308	48	16.7	5	8	71	15	1

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. Disease symptoms can be more severe in fields where both SDS and soybean cyst nematode (SCN) are present. There are not clear guidelines to determine at what point a field will have enough increase in yield to justify treatment, therefore, on-farm research projects like this one are needed.

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. Three treatments were selected to test the efficacy of the ILeVO seed treatment.

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*

A: Untreated check

B: Standard soybean treatment (for this study Trilex® 2000 Fungicide + Poncho®/VOTiVO® + Precise Seed Finisher was used)

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

Phosphorus samples (above) were taken because low phosphorus has been linked to higher severity of SDS. Soybean cyst nematode samples were also taken early in the growing season in each treatment and replication because of the relationship between SDS and SCN *(Table 1)*. This information is intended to provide a base population level for the trial.

Table 1. Average soybean csyt nematode samples for each treatment.

	Soybean Cyst Nematode (SCN) – (# eggs/100 cc soil)
Check	0 A
Standard	0 A
Standard plus ILeVO	0 A
P-Value	-

Results:

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 (DX). DX = disease incidence x disease severity/9. Disease assessments were conducted on 9/1/16 at stage R5.8 and 9/16/16 at stage R6 *(Table 2)*.

Table 2. SDS ratings taken on Sept. 1, 2016 and Sept. 16, 2016.

	Disease Severity	Disease Incidence (%)	Disease Index (DX)	Disease Severity	Disease Incidence (%)	Disease Index (DX)
	----------Sept. 1, 2016----------			----------Sept. 16, 2016----------		
Check	1.58 A*	1.4 A	0.4 A	1.92 A	2.4 A	0.7 A
Standard	1.17 A	1.3 A	0.4 A	1.33 A	1.7 A	0.5 A
Standard plus ILeVO	1.17 A	1.9 A	0.4 A	1.50 A	1.9 A	0.5 A
P-Value	0.541	0.6665	0.9606	0.4717	0.6581	0.6954

*Values with the same letter are not significantly different at a 90% confidence level.

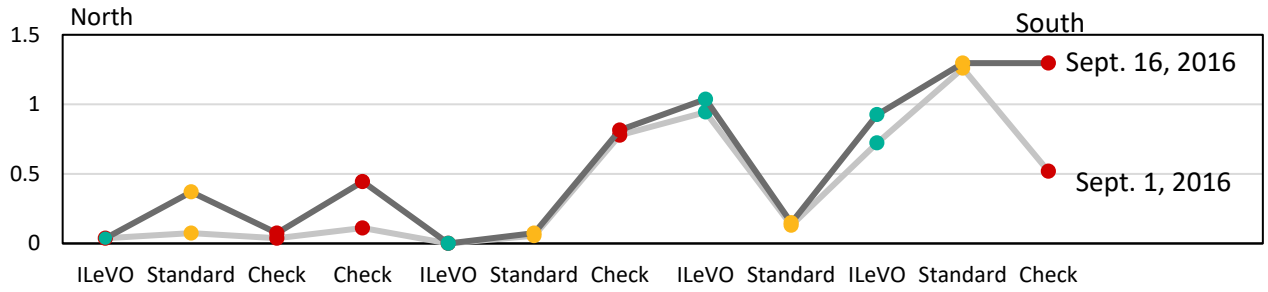


Figure 1. Disease index average by treatment from Sept. 1, 2016 and Sept. 16, 2016. Disease index scale ranges from 0 to 100.

Aerial imagery was captured on 9/10/16. True color imagery is shown in Figure 2 and false color imagery is shown in Figure 3. Imagery was used to calculate the normalized difference vegetation index (NDVI). This index is correlated with the greenness of the plant and plant health. NDVI values for the 3 treatments *(Figure 4)* were compared *(Table 3)*. Pivot tracks, other drainage areas, and a 10 foot buffer between treatments were removed before analysis *(Figure 4).*

Figure 2. True color image of study area with treatments labeled.

Figure 3. False color image of study area with treatments labeled. Brighter red indicates more green vegetation.

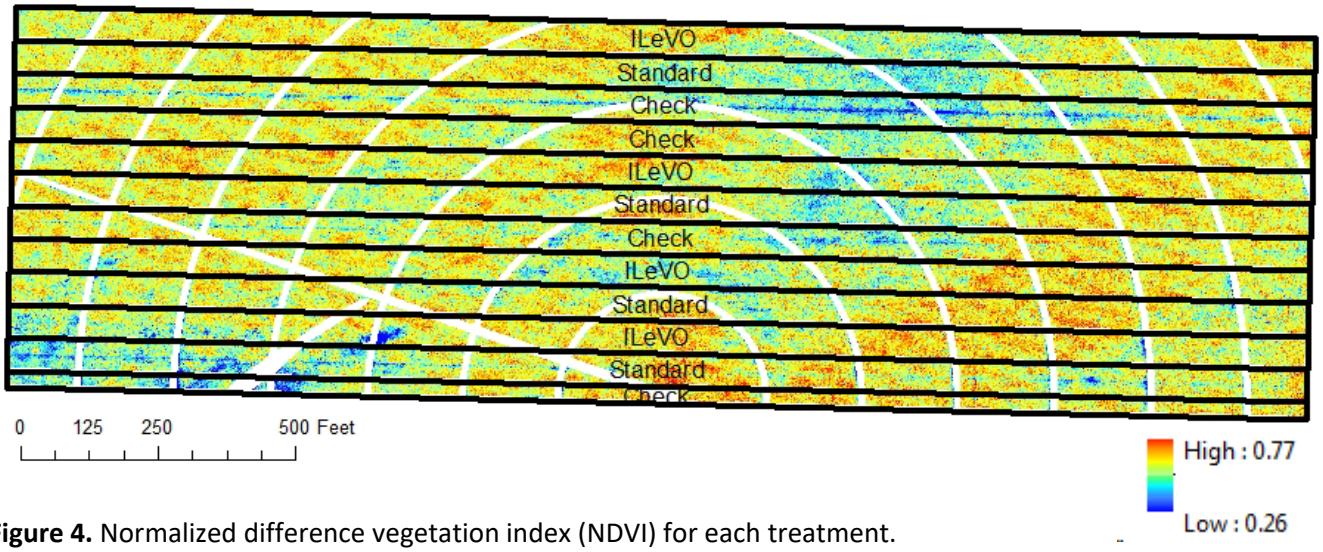


Figure 4. Normalized difference vegetation index (NDVI) for each treatment.

Table 3. NDVI average by treatment from aerial imagery on Sept. 10, 2016.

	NDVI
Check	0.60 A
Standard	0.60 A
Standard plus ILeVO	0.61 A
P-Value	0.2268

Yield was recorded using a weigh wagon. Averages for each treatment strip are shown in Figure 5. Averages by treatment are shown in Table 4.

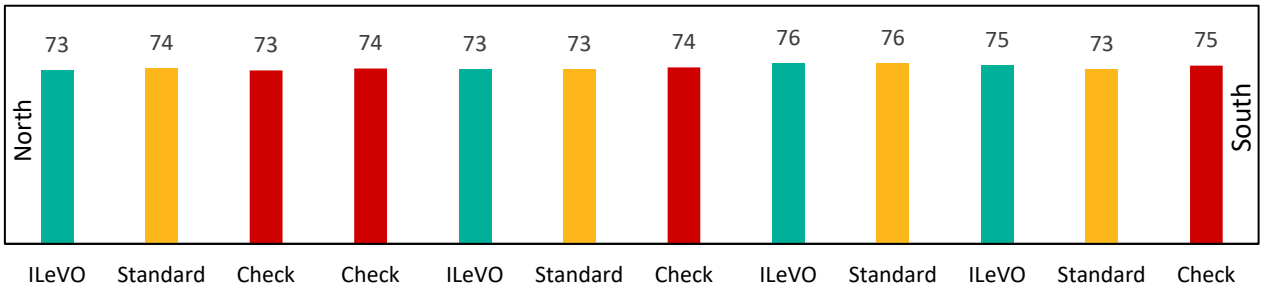


Figure 5. Yield average by treatment (bu/ac) from north to south.

Table 4. Yield from weigh wagon, and marginal net return.

	Yield (bu/ac)	Marginal Net Return‡ ($/ac)
Check	74 A	684.50
Standard	74 A	671.70
Standard plus ILeVO	74 A	656.98
P-Value	0.8893	N/A

†Bushels per acre corrected to 13% moisture
*Values with the same letter are not significantly different at a 90% confidence level.
‡Marginal net return based on $9.25/bu soybeans, $12.80/ac for standard seed treatments, and $14.72/ac for ILeVO seed treatment (based on $10.91/oz and application rate of 1.18 fl oz/140,000 seed unit).

Yield difference is not statistically different at 10% significance level.

Summary: At this site, very low SDS disease incidence and severity was noted throughout the growing season. This very low disease level resulted in no yield difference between the treatments with ILeVO and without. Additionally, the standard treatment did not provide a yield benefit over the check.

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