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Introduction

Iowa State University (ISU) has a long-standing relationship with Iowa corn and soybean farmers. As a part of this relationship, ISU works to provide quality, unbiased research data to assist in the decision-making process on farm operations. In 2006, Iowa State began to expand that commitment, with the assistance of northwest Iowa farmers, by conducting research on their farms. In 2011, ISU Farmer-Assisted Research and Management (FARM) was established to expand the northwest Iowa program to the rest of the state through Iowa State University Extension and Outreach field agronomists and ag specialists.

In 2011, 39 farmer-cooperators assisted in conducting over 90 research trials that are shared in this publication. Yield data from these trials were collected by using weigh wagons or calibrated yield monitors. As Iowa State continues to expand locations for ISU FARM, the need for farmers to participate will increase as well. If you are interested in participating in this program, please contact one of the ISU Extension and Outreach field agronomists or ag specialists listed.

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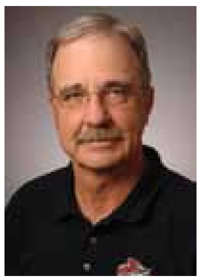

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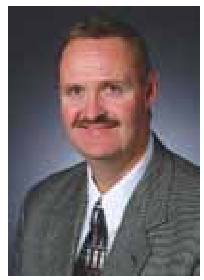

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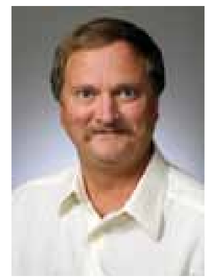

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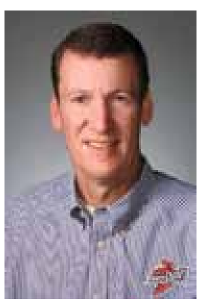

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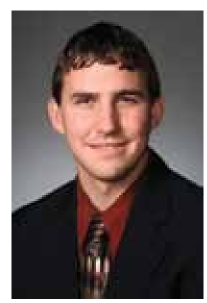

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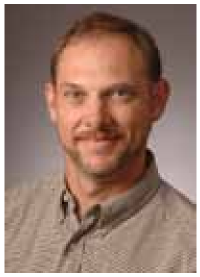

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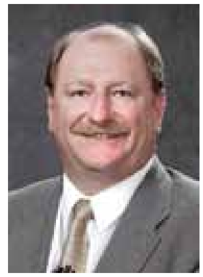

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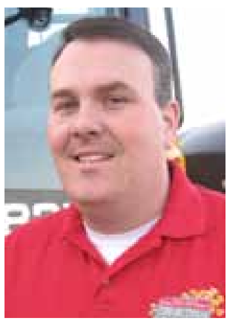

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Interpreting *P*-Values in ISU FARM Trials

Statistics Shed Light on Yield Variation

When comparing yields from a field, even when the plots measured are adjacent, the measured yields very well may differ. Yield differences can be attributed to several factors such as: variation within the soil map unit, soil fertility, moisture availability, insect infestation, disease pressure, or differences in planting or harvesting techniques.

When at least three replications of a trial are conducted, statistics can be used to determine if variations are attributed to the treatment or to factors unrelated to the treatments being compared. All trials reported were replicated at least three times at the site in the farmer cooperator's field.

P-Values

P-values are used to help determine if differences in a measurement (yield in this case) can be attributed to treatments and not other factors. The lower the *p*-value, the more likely it is that the treatments are actually affecting yield. Common benchmarks for *p*-values in field research are 0.10 and 0.05. If an experiment has a *p*-value of 0.10, we would be 90 percent confident that the differences observed are in response to the treatments. Likewise, if an experiment has a *p*-value of 0.05, we can say we are 95 percent confident that the differences observed were in response to the treatments. Keep in mind that the larger a *p*-value, the lower the probability that the treatment effect was responsible for differences observed.

A Finding of "No Statistical Difference" Is Still Valuable Data

Even if yields are not statistically different, it is important to remember that the data are still valuable because they tell us that the treatments did not produce a difference in yield (or other factors measured). Simply knowing this can help a grower learn more about the conditions and performance of a given field, as well as aid future management decisions.

Foliar Fungicides on Corn

Introduction

Foliar fungicides have become a popular way to manage fungal diseases and, in turn, protect yield. Comparisons below detail how the fungicides performed when applied to different hybrids and at different times.

Methods

Foliar fungicides on corn were evaluated at 23 locations in 2011. "Early-season" applications, which consisted of treatments at either the V5 or V6 growth stage, were evaluated at six locations. "Mid-season" applications, which included treatments at VT, R1, or R2, were evaluated at 13 locations. Four locations had applications at both early and mid-season times. See Table 1 for details on hybrid, row spacing, planting date, planting population, previous crop, and tillage. At 16 locations, disease severity on the ear leaf was evaluated two weeks following fungicide application. Disease severity was assessed at several places within each plot.

One of the locations in Lyon County (Trial 24 in Table 1) evaluated application type—aerial vs. ground. Ground application was at 13 gal/acre, 40 psi, and 6 mph, while the aerial application was at 2 gal/acre, 40 psi, and 110 mph.

Table 1. Hybrid, row spacing, planting date, planting population, previous crop, and tillage for foliar fungicide trials on corn in 2011.

Trial	County	Hybrid	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop	Tillage
1	Osceola	DeKalb 4812	30	May 5	35,000	Corn	Conventional
2	Osceola	Pioneer 9910XR	30	May 4	34,000	Soybean	No-till
3	Osceola	Pioneer PO115XR	30	May 5	33,100	Soybean	Conventional
4	Lyon	AgriGold 6384	20	May 5	34,000	Soybean	Conventional
5	Lyon	NK 53W	30	May 5	34,000	Soybean	Conventional
6	Monona	DeKalb 5883	38	April 28	31,000	Corn	Conventional
7	Osceola	DeKalb 4812	30	May 8	35,000	Corn	Conventional
8	Osceola	DeKalb 5259	30	May 5	35,000	Soybean	Conventional
9	Osceola	Pioneer 9910XR	30	May 4	34,000	Soybean	No-till
10	Lyon	DeKalb 5035	20	May 4	34,500	Soybean	Conventional
11	Lyon	DeKalb 5035	20	May 4	34,500	Soybean	Conventional
12	Osceola	Pioneer PO115XR	30	May 10	34,000	Soybean	Conventional
13	O'Brien	Pioneer PO115XR	30	May 10	34,000	Soybean	Conventional
14	Sioux	Pioneer PO115XR	36	May 3	32,267	Soybean	Conventional
15	Sioux	Pioneer PO9910XR	36	May 3	32,267	Soybean	Conventional
16	Sioux	Pioneer 34F07	30	May 3	34,000	Soybean	Conventional
17	Sioux	SCI 1051	30	April 28	33,500	Soybean	Conventional
18	Lyon	AgVenture 5267	30	May 5	33,000	Soybean	Conventional
19	Monona	DeKalb 6169	38	April 28	31,000	Corn	Conventional
20	Osceola	DeKalb 4812	30	May 5	35,000	Corn	Conventional
21	Osceola	Pioneer 9910XR	30	May 4	34,000	Soybean	No-till
22	Osceola	Pioneer PO115XR	30	May 5	33,100	Soybean	Conventional
23	Monona	DeKalb 5035	38	May 4	31,000	Corn	Conventional
24	Lyon	DeKalb 5035	20	May 4	34,500	Soybean	Conventional

Table 2. Yields of corn fungicide treated and non-treated plots in Iowa during 2011.

Trial	Application Timing	Fungicide[a]	Yield (bu/acre) Treatment	Yield (bu/acre) Control	Response	*P*-value
1	V6	Headline®	181.6*	183.2	–1.6	0.75
2	V6	Headline®	175.8*	176.7	–0.9	0.82
3	V6	Stratego® YLD	181.8	187.6	–5.8	0.52
4	V6	Stratego® YLD	202.1*	197.9	4.2	0.20
5	V6	Headline®	209.3	206.5	2.8	0.46
6	V5	Quilt Xcel®	193.2	194.2	–1.0	0.51
7	R1	Headline AMP™	186.9*	183.2	3.7	0.49
8	R1	Headline AMP™	216.0*	207.9	8.1	<0.01
9	R1	Headline AMP™	174.2*	176.7	–2.5	0.48
10	R2	Headline AMP™	208.8*	203.4	5.4	0.57
11	R2	Headline AMP™	207.9*	203.4	4.5	0.69
12	R1	Stratego® YLD	187.6	187.6	0.0	1.00
13	R1	Headline AMP™	190.0*	185.2	4.8	0.09
14	R1	Headline®	206.1*	196.9	9.2	<0.01
15	R1	Headline®	212.4*	192.0	20.4	<0.01
16	R1	Headline AMP™	214.5*	208.0	6.5	0.34
17	R1	Headline AMP™	182.3*	175.1	7.2	0.12
18	R1	Headline AMP™	183.2*	171.9	11.3	0.02
19	VT	Quilt Xcel®	196.3	192.7	3.6	0.12
20	V6 + R1	Headline AMP™	181.5*	183.2	–1.7	0.78
21	V6 + R1	Headline AMP™	177.9*	176.7	1.2	0.79
22	V6 + R1	Stratego® YLD	189.3	187.6	1.7	0.42
23	V5 + VT	Quilt Xcel®	188.0	194.2	–6.2	<0.01
			Ground	**Aerial**		
24	R2	Aerial vs. Ground	207.9*	208.8		0.90

[a]Application rates: Headline®, 6 oz/acre; Headline AMP™, 10 oz/acre; Stratego® YLD 2 oz/acre at V6, 4 oz/acre at R1; Quilt Xcel®, 10 oz/acre.

*Foliar disease severity was evaluated and less than 1 percent severity was observed on the ear leaf in the non-treated control.

Summary

Primary diseases observed were gray leaf spot, common rust, and eyespot. However, there was very little disease severity in all locations; average severity never exceeded 1 percent on the ear leaf in scouted fields, even in non-treated controls. Overall, plots with foliar fungicides averaged a 3.2 bu/acre increase compared to the non-treated controls. Yields were significantly higher with fungicide treatments when compared to the non-treated control in five of 24 trials using a *P*-value of 0.10. None of the plots with an early-season application had significantly higher yield when compared to the non-treated controls. Five of the 13 locations with mid-season applications had significantly higher yields compared to the non-treated controls. One of the four locations with two applications had significantly lower yield compared to the non-treated control (Table 2). No differences in disease or yield were observed in the fungicide ground vs. aerial application comparison.

Foliar Fungicides on Soybean

Introduction

Foliar fungicides are a soybean disease management tool and are especially used as an add-on when farmers are applying insecticides to manage soybean aphids. Comparisons below detail how fungicides performed when applied at growth stage R3 (beginning pod set) to different varieties.

Methods

Foliar fungicides used alone were compared to non-treated plots at eight locations in 2011. Out of these eight locations, Topsin®-M (thiophanate-methyl) was evaluated at one location while Headline® (pyraclostrobin) was evaluated at seven locations. Fungicide was combined with an insecticide at one location and with an insecticide and a foliar fertilizer at one location. Fungicide treatments were applied using a ground sprayer at growth stage R3. Plots in three fields were evaluated for foliar disease severity (e.g., brown spot, frogeye leaf spot, and Cercospora leaf blight) in the mid- to upper canopies during first week of September (growth stage R6).

Trials 9, 10, and 11 were funded by the Iowa Soybean Association.

Table 1. Variety, row spacing, planting date, planting population, previous crop, and tillage for foliar fungicide trials on soybean during 2011.

Trial	County	Variety	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop	Tillage
1	Sioux	Kruger 2301	15	May 6	145,000	Corn	Conventional
2	Sioux	Pioneer 91Y90	30	May 11	140,000	Corn	Conventional
3	Osceola	Kruger 2301	30	May 12	130,000	Corn	Conventional
4	Sioux	Pioneer 93M11	36	May 10	140,000	Corn	Conventional
5	Monona	NKS27C4	38 Twin	May 2	166,000	Corn	Conventional
6	Lyon	Stine 22LC32	20	May 18	145,000	Corn	No-till
7	Osceola	Pioneer 92Y30	30	May 10	140,000	Corn	No-till
8	Pocahontas	Asgrow 2031	30	May 19	152,700	Corn	No-till
9	Clay	NK S25R3	15	May 17	160,000	Corn	Conventional
10	Pocahontas	AG 2031	30	May 11	167,500	Corn	Conventional
11	Sac	Pioneer 92Y30	20	June 1	150,000	Corn	Conventional

Table 2. Yields of soybean fungicide treated and non-treated plots in Iowa in 2011.

Trial	Application Stage	Fungicide[a]	Yield (bu/acre) Treatment	Control	Response	*P*-Value
1	R3	Topsin®-M	77.6	77.0	0.6	0.63
2	R3	Headline®	73.4*	70.3	3.1	0.01
3	R3	Headline®	66.9*	64.1	2.8	0.03
4	R3	Headline®	62.7*	60.3	2.4	0.07
5	R3	Headline®	64.5	58.6	3.9	<0.01
6	R3	Headline®	57.3*	55.9	1.6	0.49
7	R3	Headline®	48.4	47.5	0.9	0.67
8	R3	Headline®	65.2	65.0	0.2	0.92
9	R3	Endigo® + Headline® [b]	62.0	57.6	4.4	0.07
10	R3	Tundra™ + Headline® [c]	65.2	65.0	0.2	0.94
11	R3	Headline® + Warrior® + ENC[d]	44.6	39.5	5.1	<0.01

[a]Application rates: Topsin®-M, 6 oz/acre; Headline®, 6 oz/acre; Tundra™, 4 oz/acre; Endigo®, 3.5 oz/acre; Warrior®, (3 oz/acre); ENC, 2 qt/acre.

[b]Fungicide was combined with insecticide (Endigo®).

[c]Fungicide was combined with insecticide (Tundra™) and was compared to spraying the insecticide alone.

[d]Fungicide was combined with insecticide (Warrior®) plus foliar fertilizer (ENC). Treatments that involved fungicides alone, insecticide alone or foliar fertilizer alone were not included.

*Disease severity in these fields was assessed in September and severity levels did not exceed 1% for any foliar diseases controlled by fungicides.

Summary

In general, disease severity was very low (less than 1 percent severity) in all three fields where disease notes were taken. Average yield response for trials with only fungicides was 1.9 bu/acre. Both of the trials that had multiple products applied had significant yield responses, but we cannot distinguish which product increased yields.

Corn Herbicide Comparison

Introduction

Some believe glyphosate use on corn may cause crop damage, resulting in potential yield reduction. In this study, the use of Halex® GT, which contains glyphosate, was compared to Impact®, which does not. The chemical formulation of Halex® GT is 20 oz glyphosate, 2.5 oz mesotrione, and 0.83 pints of S-metolachlor; plus 1 pint of Class Act®, an adjuvant. Impact® is 0.75 oz of tompramazone. The applicator added 0.5 lbs of Aatrex® (atrazine) plus 19.2 oz of MSO, and 2 lbs of AMS. This comparison was a total post-emerge application program. No pre-emerge herbicides were used.

Methods

The plot was located in Lyon County. DeKalb 5509 was planted into 22-inch rows and at a population of 36,000 seeds/acre on May 6. The field was corn in 2010 and used a conventional tillage system. Treatments were applied post-emergence on May 6, 2011.

A similar study was done in 2010 with the same cooperator.

Table 1. Corn yields comparing glyphosate and non-glyphosate herbicide in northwest Iowa in 2011.

	Yield (bu/acre)		
Trial	**Impact**	**Halex® GT**	***P*-Value**
1 (2011)	214.7	214.2	0.26
2 (2010)	213.1	212.7	0.83

Summary

We found no yield differences between the use of Halex® GT and Impact® in either year. If glyphosate did create a stress on the corn plant, it did not translate to a negative yield response. Observations at the V6 stage did not show any weed pressure differences.

Pesticide Application Costs in Soybean

Introduction

To a grower, pesticide application costs typically include the cost of pesticides, equipment use, and time. A potential hidden cost is loss of yield from driving through a field during the mid- to late reproductive stages of soybean. The objective of this trial was to determine soybean yield lost when driving through a field planted into 15-inch rows, which is a result of sprayer tires crushing plants.

Methods

Soybeans were planted in 15-inch rows and were sprayed with a two-pass glyphosate (June and July) and insecticide program according to John Deere's SF2 auto guidance. Using a John Deere 4930 sprayer on 380 105R50 (15-inch-wide) tires, two different spray track patterns were tested from the planted track; a 4-degree offset and a 90-degree offset. Both track patterns were compared to spray tracks that are parallel to the rows. Treatments were harvested by centering the parallel track on the combine platform and harvesting the adjacent 35 feet.

Table 1. Variety, row spacing, planting date, planting population, previous crop, and tillage for pesticide application study on soybean during 2011.

Trial	County	Variety	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop	Tillage
1	Lyon	NK24J1	15	May 18	150,000	Corn	Conventional
2	Lyon	NK21N6	15	May 19	150,000	Corn	Conventional

Table 2. Soybean yields associated with different fungicide application methods: track patterns and no track patterns.

		Yield (bu/acre)		
Trial	Spray Track Pattern	Spray Pattern with Tracks	Spray Pattern without Tracks	*P*-Value
1	4-degree offset	48.9	48.9	0.99
2	Perpendicular	45.8	42.4	0.12

Summary

Farmers are often curious about the yield penalty that they will occur from driving down soybeans in August to treat soybean aphids. These two locations would indicate that there is minimal if any effect due to driving down soybean plants to apply pesticides. A question that remains is could trial #2 yield increase have occurred because the border rows of the "driven down" rows were able to utilize the extra sunlight and other resources?

Nutrient Trials

Introduction

The addition of micronutrients to a crop management system has received a lot of attention lately. Field trials comparing nutrient applications with a non-treated control were conducted in seven locations. Small plot research indicates that the best chance for a response to a sulfur application would be predominantly on low organic matter soils, eroded side hills, coarse soil textures, and fields that do not have any recent manure history (>5 years).

Methods

Calcium Sulfate

Five calcium sulfate trials were conducted in 2011, four on soybean and one on corn. Farms were selected on the basis of little or no manure history in the last five years. Soil samples were taken before sulfur application to identify the current sulfur content in each trial and are denoted in the table below. Pelletized calcium sulfate was broadcast prior to planting with a Gandy drop spreader at the rate of 23 actual pounds of sulfur. Fertilizer at all locations, except trial 5, was incorporated after application. In 2011, four trials were on soybean, and one was on corn.

Micronutrient and Herbicide

Treatments for Trial 6 were Awaken®, Awaken® + Cobra®, and untreated control. Cobra® was applied at 12 oz/acre at V3/V4 with UAN and crop oil. Awaken® was then applied at R1 with Bio-Forge® at 16 oz/acre.

In Trial 7, all treatments received a preplant herbicide application of Dual II Magnum® (1.25 qt/acre) and glyphosate (24 oz/acre) on May 16. A follow-up herbicide application of glyphosate (40 oz/acre) and Select® (6 oz/acre) was applied June 18. Treatments were then applied on July 8 according to the plot design at the following rates: glyphosate, 40 oz/acre; zinc, 4 qt/acre; manganese, 4 qt/acre. Pre-application tissue samples were collected on July 20.

Funding for Trial 6 was provided by the Iowa Soybean Association. Funding for Trial 7 was provided by the Iowa Soybean Association and the Committee for Agricultural Development.

Table 1. Hybrid or variety, row spacing, planting date, planting population, previous crop, and tillage for sulfur trials on soybean and corn during 2011.

Trial	County	Variety/Hybrid	Planting Date	Planting Population (seeds/acre)	Soil Type	Previous Crop	Tillage
1	Osceola	Asgrow 1830	May 11	150,000	Ransom silty clay loam	Corn	Conventional
2	Lyon	NK25R3	May 18	150,000	Moody and Egan silty clay loam	Corn	Conventional
3	Lyon	NK25R3	May 12	145,000	Moody silty clay loam	Corn	Conventional
4	Sioux	Pioneer 92Y31	May 10	140,000	Galva silty clay loam	Corn	Conventional
5	Lyon	Pioneer 35F44	May 11	34,500	Moody silty clay loam	Soybean	No-till
6	Dallas	Pioneer 93Y13	May 6	155,000	—	Corn	—
7	Story	Pioneer 92Y51	May 11	138,000	—	Corn	—

Table 2. Yields from calcium sulfate trials (1–5) conducted in five ISU FARM trials in northwest Iowa in 2011.

Trial	Crop	Organic Matter (%)	Sulfur Soil Test (ppm)	Yield (bu/acre) Treatment	Yield (bu/acre) Control	*P*-Value
1	Soybean	4.5	9	70.9	68.8	0.35
2	Soybean	3.6	10	60.4	60.9	0.86
3	Soybean	3.8	15	60.8	59.3	0.46
4	Soybean	3.3	8	46.5	46.0	0.51
5	Corn	3.7	8	208.6	197.1	0.30

Table 3. Agronomic data, including yield components and harvest data, from a foliar fertilizer plus insecticide study (Trial 6) on soybean in 2011.

Treatment	Plant Height (cm)	Plant Nodes (no.)	Plant Branches (no.)	Grain Moisture (%)	Grain Yield (bu/acre)
Control	86.2	14.3	2.4	8.6	53.2
Foliar fertilizer	83.8	14.3	2.5	8.6	52.6
Cobra® + foliar fertilizer	80.9	14.4	2.6	8.6	54.5
P-value	0.76	0.92	0.57	0.50	0.13

Table 4. Agronomic data, including yield components and harvest data, from a nutrient and herbicide study (Trial 7) on soybean in 2011.

	Tissue Mn		Tissue Zn			
Treatment	Pre-Treated (ppm)	Post-Treated (ppm)	Pre-Treated (ppm)	Post-Treated (ppm)	Grain Moisture (%)	Grain Yield (bu/acre)
Control	62	76	23	41	6.36	59.2
Glyphosate	61	59	26	44	5.64	61.6
Manganese	64	69	25	41	6.11	59.7
Zinc	71	78	25	41	5.71	60.9
Gly + Mn	67	77	25	42	5.62	60.9
Gly + Zn	60	63	24	43	5.63	62.4
Gly + Mn + Zn	64	71	27	45	6.05	61.9
P-value	<0.01	<0.01	0.17	0.09	0.68	0.28

Summary

There were no yield differences between calcium sulfate and the non-treated control at all five locations. The soil types at these locations in northwest Iowa are predominantly a finer textured soil and have a medium to high percent organic matter. We suspect the additions of micronutrients are unlikely to increase yield under these circumstances. These plots have been fertilized for a two-year study ending in 2012.

No differences were seen between treatments in the measured yield components or yield in Trial 6 in 2011. Interestingly, plant height was the highest in the non-treated control plots while the average number of nodes was equal across treatments.

In Trial 7, the application of nutrients did not result in a positive yield change when compared to the control. It is even unclear if the plants had an increased uptake of the nutrients applied in this study.

Corn Rootworm Trials

Introduction

The introduction of the corn rootworm (CRW) insecticidal protein into hybrid seed corn has allowed farmers to rely on genetic resistance for root protection as opposed to granular insecticides. However, some farmers are interested to see if there is an economic return by adding the granular insecticide to the CRW-resistant corn.

Methods

Granular insecticide was applied in-furrow with the planter. Not each treatment, however, received granular insecticide. Five roots were dug, washed, and evaluated in mid-August for corn rootworm feeding in each plot.

Table 1. Hybrid, row spacing, planting date, planting population, previous crop and tillage for corn rootworm trials on corn during 2011.

Trial	County	Hybrid(s)	CRW Trait(s)	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop
1	Lyon	Channel 202-32	SmartStax®	22	May 7	36,000	Corn
2	Lyon	DeKalb 5509	SmartStax®	22	May 5	36,000	Corn
3	Lyon	Pioneer PO448XR	HXX	22	May 3	37,000	Soybean
4	Lyon	DeKalb 5262	Conventional	20	May 6	34,500	Corn
		DeKalb 5259	VT3				
		DeKalb 4994	SmartStax®				
5	Sioux	NK N68B-3000GT	Conventional	36	May 3	32,267	Soybean
		NK N688-3000GY	VT3				
		NK K68B-3111	Viptera™				
6	Monona	Renze 4240LL/RR2	Conventional	30	May 9	32,306	Corn
		Renze 2240LL/RR2	HXX				
		Renze 3240	SmartStax®				

Table 2. Yields of rootworm-resistant corn and conventional corn with and without insecticide.

Trial	Treatment	Root Rating	Yield (bu/acre)	*P*-Value*
1	SmartStax® + Fortress®	—	232.7	0.01
	SmartStax®	—	220.0	
2	SmartStax® + Fortress®	—	213.3	0.04
	SmartStax®	—	209.3	
3	SmartStax® + Fortress®	0.1	213.9	0.65
	SmartStax®	0.1	213.1	
4	SmartStax®	0.1	183.7	0.09
	VT3 + Aztec® 4.67G	0.1	194.3	
	VT3	0.2	189.1	
	Conventional + Aztec® 4.67G	0.3	193.8	
	Conventional	0.7	193.2	
5	Viptera™	0.1	197.4	0.04
	Conventional + Force®	0.1	212.0	
	VT3	0.1	211.7	
	Conventional	0.1	204.9	
6	SmartStax®	0.1	183.8	0.16
	VT3	0.1	182.2	
	Conventional + Aztec® 7.3G	0.1	177.6	
	Conventional	0.1	177.8	

*In trials where more than two treatments were tested, the *p*-value represents the experiment-wise treatment effect but not all pair-wise comparisons.

Summary

Overall, corn rootworm damage was low at all locations; only the conventional corn in trial 4 had more than half of a node destroyed. In trials 1 and 2, there was an added yield benefit when a granular insecticide was used with the CRW-resistant corn. However, in all other trials, the addition of a granular insecticide to the resistant varieties was not beneficial.
When compared to conventional varieties, the resistant varieties were not clearly more beneficial in yield in these studies. Though root feeding of corn rootworm was assessed in each plot, we did not assess the presence of other soilborne insects.

Plant Population Trials

Introduction

Farmers continue to increase corn planting populations. Conversely, soybean populations are decreasing as the use of seed treatments increases. These trials evaluated the effect of differing plant populations on grain yield.

Methods

Corn growers compared the population that they were currently using with a population that was 5 to 10 percent more. The variable rate planting trial (Trial 3) was based off of yield history and topography. Higher yielding, well-drained areas were planted at a higher rate than others.

The lone soybean trial (Trial 4) compared plant populations at 130,000 and 155,000 seeds/acre. Seed was treated with Trilex™ and Gaucho®.

Table 1. Hybrid or variety, row spacing, planting date, and previous crop for corn and soybean planting population trials in 2011.

Trial	County	Hybrid/Variety	Row Spacing (inches)	Planting Date	Previous Crop
1	Sioux	Pioneer PO453HR	36	April 29	Soybean
2	Sioux	Pioneer PO453HR	36 Twin	April 29	Soybean
3	Buena Vista	Pioneer 34F07	30	May 4	Soybean
4	Dallas	Pioneer 92Y30	15	May 19	Corn

Table 2. Yields of corn and soybean at different populations conducted in four trials during the 2011 in northwest Iowa.

Trial	Crop	Planted Population	Fall Population	Yield	*P*-Value
1	Corn	36,000	31,500	233.3	0.19
		40,000	N/A	236.5	
2	Corn	36,000	34,500	235.9	0.58
		40,000	36,000	243.9	
3	Corn	33,000	29,270	206.4	0.98
		Variable	30,375	206.4	
			Spring Population		
4	Soybean	130,000	129,340	56.1	0.42
		155,000	148,774	53.4	

Summary

There were no differences in yield for the three corn plant population trials conducted during 2011. Final stand counts were comparable between treatments at two of the three trials. The difference of the fall population between the treatments is not known. There was no yield difference between the planting rates in the soybean trial.

Planting Date

Introduction

Iowa State University research indicates that the optimal planting date for soybeans in the northern third of Iowa is the first week in May, if soil conditions are favorable. Planting too early can expose seedlings to frost and increase the chances of SDS when the soil is cool; any benefit of planting early is negated. The ideal planting date for the remainder of the state is the last week of April.

Methods

Soybeans were planted at an "early" and "late" planting date. The late planting dates in this study were 2 to 3 weeks after the early planting date. Plots were designed by staking both ends of the experiment and randomizing the planting date. Centers of each strip were harvested to avoid any border effect due to large gaps or overlaps.

Table 1. Variety, row spacing, planting population, and tillage for soybean planting date studies in 2011.

Trial	County	Cultivar	Row Spacing (inches)	Planting Population (seeds/acre)	Tillage
1	Sioux	Pioneer 92Y31	36	140,000	Conventional
2	Monona	Renze 2889RRCN	30	139,000	No-till
3	Monona	Renze 2889RRCN	30	139,000	No-till

Table 2. Yields from soybean planting date trials in 2011.

Trial	Seed Treatment	Planting Date	Yield	*P*-Value
1	None	May 10	57.8	0.89
		May 24	57.3	
2	CruiserMaxx®	April 30	55.7	<0.01
		May 19	49.7	
3	None	April 30	54.1	<0.01
		May 19	47.6	

Summary

Results from these trials would parallel small plot research done at ISU. A late April planting date did increase yield by nearly 6 bushels per acre in the bottom two-thirds of Iowa. As expected, the Sioux County location's first planting date was not the first week of May. Both planting dates occurred in the average range of the soybean planting window, thus could be a reason for not seeing a yield response to planting date.

Residual No-Till Soybean-Corn Production

Introduction

Previous data suggested a possible yield drag for corn when planting into no-till soybeans. This year we had cooperators who compared no-till and tillage in 2010. In 2011, the entire experiment was conventionally tilled but had marked locations of previous tillage strips. Data were collected to identify possible yield effects. This is the second year of this study; 2010 data are included in this report (Tables 2 and 4).

Methods

Farmers who participated in a soybean tillage/no tillage comparison in 2010 conventionally tilled their entire plot in 2011 and planted corn. The 2010 no-till strips were located within the experiment. Residue percentages and stand counts were recorded in the spring.

Table 1. Hybrid, row spacing, planting date, and planting population of corn in the residual no-till soybean-corn production trials in 2011.

Trial	County	Hybrid	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)
1	Lyon	NK53W	20	May 10	33,000
2	Lyon	Mycogen 2H566	20	May 10	33,000
3	Lyon	AgVenture	30	May 3	33,000
4	Sioux	Pioneer 36V51	36	May 3	31,100

Table 2. Hybrid, row spacing, planting date, and planting population of corn in the residual no-till soybean-corn production trials in 2010.

Trial	County	Hybrid	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)
1	Lyon	AgVenture 6157	30	April 23	Variable
2	Lyon	DeKalb 5066	22	April 23	38,000
3	Lyon	Pioneer 9910XR	22	April 28	35,500
4	Lyon	DeKalb 5259	30	April 22	30,000
5	Sioux	Golden Harvest 8061	30	April 28	32,000

Table 3. Yields of corn with tillage or no-tillage in 2011.

		Residue (%)		Spring Population		Yield (bu/acre)		
Trial	**Previous Crop**	**Till**	**No-Till**	**Till**	**No-Till**	**Till**	**No-Till**	***P*-Value**
1	Soybean	13	18	30,000	31,000	208.6	209.3	0.83
2	Soybean	13	18	30,000	31,000	194.7	193.6	0.34
3	Soybean	17	26	30,500	30,750	187.2	183.5	0.17
4	Soybean	16	28	29,500	32,000	200.0	205.2	0.51

Table 4. Yields of corn with tillage or no-tillage in 2010.

		Residue (%)		Spring Population		Yield (bu/acre)		
Trial	**Previous Crop**	**Till**	**No-Till**	**Till**	**No-Till**	**Till**	**No-Till**	***P*-Value**
1	Soybean	—	—	23,500	22,500	199.1	182.9	0.53
2	Soybean	9	12	29,833	29,500	218.0	213.4	0.01
3	Soybean	11	18	32,400	35,000	221.0	219.7	0.83
4	Soybean	19	25	26,000	25,833	206.6	206.5	0.99
5	Soybean	24	28	30,500	27,167	191.0	181.0	0.08

Summary

There was no effect of previous no-till practices on corn yields in 2011 (Table 3), which is consistent with data from 2010 (Table 4), where only one trial showed evidence of tillage having a positive impact on yield. Tilling fields immediately after growing soybeans in northwest Iowa will likely result in greater corn yields the following season.

Aphid-Resistant Soybean Comparisons

Introduction

Varieties are now available that are resistance to soybean aphid. The use of this trait is relatively new to Iowa. In two trials in 2011, the aphid-resistant variety was compared with a soybean aphid-susceptible variety. The AMS, aphid management system, costs an additional $4/bag.

Methods

In Trial 1, an aphid-resistant variety (NK25F2) was compared to a susceptible variety (NK25R3) and neither were sprayed with an insecticide. In Trial 2, the same varieties were compared, but both were sprayed with the insecticide Endigo® (4 oz/acre) on August 11, 2011 (R4 growth stage). Aphids did not reach economic threshold in Trial 2 by the spray date. Cumulative aphid days (CAD) were recorded in 2011 and measure a plant's exposure to aphids over the entire growing season.

Table 1. Varieties used, row spacing, planting date, planting population, previous crop, and tillage for the aphid-resistant soybean study in 2011.

Trial	County	Variety	Aphid Resistance	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop	Tillage
1	Sioux	NK25F2 AMS	Yes	36	May 10	140,000	Corn	Conventional
		NK25R3	No					
2	Sioux	NK25F2 AMS	Yes	36	May 10	140,000	Corn	Conventional
		NK25R3	No					

Table 2. Varieties used, row spacing planting date, planting population, previous crop, and tillage for the aphid-resistant soybean study in 2010.

Trial	County	Variety	Aphid Resistance	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop	Tillage
1	Lyon	NK S 25F2 AMS	Yes	15	May 13	155,000	Corn	Conventional
		NK25T8	No					
2	Clay	NK S 25F2 AMS	Yes	30	May 18	139,000	Corn	Conventional
		NK25T8	No					
3*	Clay	NK S 25F2 AMS	Yes	30	May 18	139,000	Corn	Conventional
		NK25T8	No					

*Both varieties were sprayed with Headline® (6 oz/acre) at R3.

Table 3. Yields from two aphid trials testing the use of aphid-resistant varieties against a conventional with and without an insecticide.

		CAD[a]		Yield (bu/acre)		
Trial	Insecticide	Resistant	Susceptible	Resistant	Susceptible	*P*-Value
1	No	520	5432	64.2	62.9	0.51
2	Yes[b]	9	26	64.2	66.7	0.12

[a]Cumulative aphid days is a measurement of a plant's exposure to aphids.
[b]Endigo® (4 oz/acre) applied at growth stage R4.

Table 4. Yields from two aphid trials testing the use of aphid-resistant varieties against an untreated control in 2010.

		Yield (bu/acre)		
Trial	Insecticide	Resistant	Susceptible	*P*-Value
1	No	62.4	60.6	0.10
2	No	57.7	62.6	0.07
3	No	61.8	66.3	0.01

Summary

There were no significant yield differences detected between aphid-resistant and conventional varieties with or without the use of insecticide in 2011. However, the use of an aphid-resistant variety greatly reduced the cumulative aphid days when compared to the control, which, in years when aphids are high, could result in a yield increase. In 2010, there was a mixed response. In Trial 1, the resistant variety had higher yields than the susceptible and in the remaining two trials the susceptible varieties had higher yields than the resistant varieties.

Aphid populations were not assessed in 2010 and in 2011 aphids did not exceed the economic threshold at either location.

Row Spacing

Introduction

Farmers continue to ask, "What is the optimal row spacing for corn and soybeans?" Iowa State University research indicates that higher yields are associated with narrower row spacing, especially less than 30 inches for soybeans. Data for corn spacing are still inconclusive. Testing row spacing for corn is more of a challenge than for soybeans due to the requirements of extra equipment. Cooperators compared row widths in both corn and soybean to identify any increase in yield due to row spacing.

Methods

Corn and soybean fields were planted at different spacings to determine how narrower spacing affects yields. Each trial, except Trials 1, 5, and 10 used the same planter, reduced the population, and planted offset according to the compared row spacing. Trials 1 and 5 used two different planters. Trial 10 used a planter and a grain drill to compare row spacings.

Table 1. Hybrid or variety, row comparison, planting date, population rate, and previous crop of row spacing studies in corn and soybean.

Trial	County	Hybrid/Variety	Row Spacing Comparison (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop
1	Lyon	NK47V	30/20	May 3/5	34,000	Soybean
2	Sioux	Pioneer PO453HR	36/36 Twin	May 3	36,000	Soybean
3	Sioux	Pioneer PO453HR	36/36 Twin	May 3	40,000	Soybean
4	Buena Vista	DeKalb 5508	36/36 Twin	May 19	31,600	Soybean
5	Monona	DeKalb 6342	30/38	May 5	31,000	Corn
6	Sioux	Pioneer 92Y31	36/18	May 10	140,000	Corn
7	Sioux	Pioneer 92Y31	36/36 Twin	May 10	140,000	Corn
8	Sioux	Pioneer 92Y31	18/36 Twin	May 10	140,000	Corn
9	Buena Vista	Prairie Brand Seeds 2667	18/36	May 25	125,000	Corn
10	Sac	NK25T8	30/18	May 7	150,000	Corn

Table 2. Yields and row widths of corn and soybean in 2011.

Trial	Crop	Row Spacing (inches)	Yield	*P*-Value
1	Corn	20	206.4	0.03
		30	199.7	
2	Corn	36	235.9	0.66
		36 twin	233.3	
3	Corn	36	243.9	0.18
		36 twin	236.5	
4	Corn	36	191.6	<0.01
		36 twin	170.0	
5	Corn	30	189.1	<0.01
		38	175.8	
6	Soybean	18	69.2	<0.01
		36	61.1	
7	Soybean	36	69.2	0.04
		36 twin	66.0	
8	Soybean	18	66.0	<0.01
		36 twin	61.1	
9	Soybean	18	50.5	0.48
		36	51.7	
10	Soybean	30	62.1	0.03
		18	59.6	

Summary

One of the three corn trials that compared 36-inch rows and 36-inch twin rows had a yield response using the criteria of a $P < 0.10$, though the 36-inch row spacing was higher in Trials 2–4. The 20-inch spacing had significantly greater yields than the 30-inch spacing in Trial 1 and the 30-inch spacing had higher yields than the 38-inch spacing in Trial 5. In soybean trials, 18-inch spacing had higher yields than 36-inch spacing in Trial 6, while in Trial 9 there was no difference. Traditional spacings, 18 inch and 36 inch, in Trials 7 and 8, respectively, had greater yields than the 36-inch row spacing.

Tillage Comparisons

Introduction

Past small plot research suggests that no-till soybeans in the loess soils of Iowa can be a viable production practice. In this study, farmers in northwest Iowa wanted to compare a soybean no-till system to identify if no-till would work on their farm. Each of these comparisons is a single year no-till program, except Trial 1 in Sioux County. This location has been a continuous no-till program for six years.

Methods

The typical tillage pass occurred in the spring unless noted in the trial information. Farmers used a tandem disk or soil finisher to till the ground prior to planting.

Table 1. Hybrid or variety, row spacing, planting date, and planting populations of corn and soybean tillage comparison studies conducted in 2011.

Trial	County	Hybrid/Variety	Row Spacing Comparison (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop
1	Sioux	NK 25F2	30	May 17	140,000	Corn
2	Lyon	AgVenture 22C4	30	May 16	160,000	Corn
3	Sioux	NK21N6	30	May 10	141,000	Corn
4	Sioux	NK21N6	30	May 13	130,000	Corn
5	Buena Vista	21RB62	20	May 19	140,000	Corn
6	Lyon	NKS25-R3	30	May 12	140,000	Corn
7	Lyon	NKS25-R3	30	May 12	140,000	Corn
8	Buena Vista	Channel 2200	30	May 9	135,000	Corn
9	Osceola	Pioneer 37K11	30	May 2	39,000	Soybean

Table 2. Results of tillage studies with soybean and corn in 2011.

Trial	Crop	Previous Crop	Treatment	Residue (%)	Fall population	Yield	*P*-Value
1	Soybean	Corn	Till	21	108,147	58.6	0.64
			No-till	77	114,571	57.6	
2	Soybean	Corn	Till	31	109,218	49.1	0.51
			No-till	87	106,006	48.3	
3	Soybean	Corn	Till	44	120,000	69.1	0.75
			No-till	76	124,000	68.5	
4	Soybean	Corn	Till	37	129,552	46.5	0.04
			No-till	85	130,634	44.2	
5	Soybean	Corn	Fall deep rip	—	135,200	56.9	0.39
			No-till	—	132,500	55.6	
6	Soybean	Corn	Till	26	134,000	57.3	0.85
			No-till	72	110,000	57.7	
7	Soybean	Corn	Till	28	135,500	58.3	0.05
			No-till	68	131,000	55.6	
8	Soybean	Corn	Fall strip till	—	—	60.0	0.29
			No-till	—	—	58.1	
9	Corn	Soybean	Fall strip till	72	36,500	159.1	0.29
			No-till	83	36,000	151.0	

Summary

The results from the soybean tillage comparisons are very similar to what we have seen in previous years. On average, the tilled plots yielded slightly higher than the no-till plots. However, farmers should account for the costs associated with a tillage program, which includes equipment use, fuel, and time. Although there was an 8.1 bu/acre yield difference between tilled and no-till in the corn trial, there was very high variability.

Seed Treatments and Inoculants

Introduction

Several different types of seed treatments and inoculants exist in the market. The key question is, "Do they pay?" Iowa State University research indicates that the primary role of a seed treatment is protecting the emerging seedlings. Seed treatments can offer protection from seedling pathogens, insects, and/or nematodes.

Methods

Seed inoculation occurred shortly before planting and mixed in the field. Seed was treated prior to delivery to the test location. In most cases, the planter was split to compare the treatments.

Trial 5 was funded by the Iowa Soybean Association.

Table 1. Hybrid or variety, row spacing, planting date, planting population, previous crop, and tillage of seed treatment study trials on corn and soybean in 2011.

Trial	County	Hybrid/Variety	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop	Tillage
1	Sioux	Pioneer 37K11	36	May 11	32,267	Soybean	Conventional
2	Sioux	DeKalb 5378	36	May 3	32,267	Soybean	Conventional
3	Monona	LG25440LL	30	May 8	34,409	Soybean	No-till
4	Monona	Asgrow AG2931	30	May 6	138,989	Pasture	No-till
5	Kossuth	Mycogen 5N210	30	May 11	120,000	Corn	Conventional
6	Lyon	NKS25R3	30	May 12	145,000	Soybean	Conventional
7	Lyon	NKS25R3	30	May 12	145,000	Soybean	No-till
8	Monona	Renze 2889RRCN	30	April 30	139,000	Corn	No-till
9	Monona	Renze 2889RRCN	30	May 19	139,000	Corn	No-till
10	Sioux	Croplan R2T2440	30	May 10	120,000	Corn	Conventional

Table 2. Yields of corn and soybeans in trials with seed treatments and inoculants in Iowa in 2011.

Trial	Crop	Spring Stand	Seed Treatment Type	Treatment	Yield	*P*-Value
1	Corn	29,000	Nematicide	Votivo™	193.2	0.09
				Control[a]	198.4	
2	Corn	32,000	Inoculants	Quick Roots® [b]	218.7	0.93
				Control	218.5	
3	Corn	33,250	Micronutrient	Conklin Amp D® [b]	206.3	0.02
		32,000		Control	199.7	
4	Soybean	129,083	Inoculants	BioBoost® [c]	59.1	<0.01
		128,667		Magnify®	59.2	
		128,333		Control	54.6	
5	Soybean	—	Fungicide/Insecticide/Nematicide	Avicta®[d]	63.9	0.97
				Control	64.0	
6	Soybean	118,855	Fungicide/Insecticide	CruiserMaxx®	57.3	0.64
				Control	58.3	
7	Soybean	112,430	Fungicide/Insecticide	CruiserMaxx®	57.7	0.17
		109,218		Control	55.6	
8	Soybean	132,830	Fungicide/Insecticide	CruiserMaxx®	55.7	0.09
		128,500		Control	54.1	
9	Soybean	133,330	Fungicide/Insecticide	CruiserMaxx®	49.7	0.05
		129,170		Control	47.6	
10	Soybean	104,000	Fungicide	Warden™ RTA®	69.1	0.41
		93,000		Control	68.2	

[a]Poncho™ (fungicide plus insecticide) seed treatment was applied to all treatments.
[b]Acceleron® (fungicide plus insecticide) seed treatment was applied to all treatments.
[c]Inovate® (fungicide plus insecticide) seed treatment was applied to all treatments.
[d]CruiserMaxx® (fungicide plus insecticide) seed treatment was applied to all treatments.

Summary

In corn, there was an increase of 6.6 bu/acre with the use of the seed treatment Conklin Amp D® in Trial 3. The remaining seed treatments did not have a yield response.

In soybean, the use of inoculants (BioBoost® and Magnify®) in Trial 4 increased yield compared to the non-treated control. This location had been pasture for many years and the use of inoculants is generally recommended in those situations. CruiserMaxx®, a fungicide plus insecticide seed treatment, increased yield an average of 1.2 bu/acre.

Manure, Nitrogen, and Stabilizing Projects

Introduction

Soil fertility is a key component in crop production. Many producers wonder about the proper rate of nitrogen, how much nitrogen will leach through the soil, and what to plan on for N losses. The following studies entail different scenarios, application timings, and products.

Methods

Several of these locations involve manure application. Trial 1 compared a spring application of anhydrous ammonia as an additional rate of nitrogen. Trial 2 broadcast 50 units of 28% nitrogen post emerge with 100 units of nitrogen broadcast in strips as 28% prior to planting or side dress injected at V6. Trial 3 compared the addition of Instinct™ to 200 units of nitrogen in the 28% form. Strips were broadcast spread in 120-foot widths without Instinct™ by GPS. Instinct™ was added to the 200 units of nitrogen, again in the 28% form and spread on the remaining strips. Trial 4 was a comparison of the rate of chicken litter to soybean ground. Chicken litter was spread and incorporated prior to planting.

Trial 4 was funded by the Iowa Soybean Association.

Table 1. Hybrid or variety, row spacing, planting date, planting population, previous crop, and tillage of manure, nitrogen, and stabilizing projects in 2011.

Trial	County	Hybrid/Variety	Row Spacing (inches)	Planting Date	Planting Population (seeds/acre)	Previous Crop	Tillage
1	Buena Vista	Pioneer PO0528AM1	30	May 5	33,100	Soybean	Conventional
2	Sac	Golden Harvest 8969-3111	30	May 1	—	Soybean	No-till
3	Osceola	DeKalb 4812	30	May 5	35,000	Corn	Conventional
4	Buena Vista	Asgrow 2108	30	May 12	140,000	Corn	Conventional

Table 2. Various fertilizer ISU FARM trials conducted in Iowa in 2011.

Trial	Treatment	Fall Stalk Nitrate Test	Yield	P-Value
1	Manure	14	201.3	0.02
	Manure + NH_3	514	209.8	
2	Pre-plant	511	183.6	0.19
	Side dress @ V6	16	175.2	
3	Instinct™	—	192.6	0.78
	Control	—	193.8	
4	One ton	—	61.7	0.20
	Two tons	—	62.3	
	Control	—	60.7	

Summary

Only one trial showed evidence of differences between treatments. Iowa State University has developed an N-rate calculator that allows the user to input their cost of nitrogen and selling price of corn to help determine the optimal rate of nitrogen. Nitrogen rate application continues to be difficult to predict due to yearly environmental and economic changes. Multiple locations, rates, and studies help draw a stronger conclusion. These studies would show that when application rates were near suggested rates (130 lbs/acre following soybean; 190 lbs/acre following corn) responses to additional nitrogen rates did not occur. The one location that did respond was because the control (fall-applied manure) was at a total nitrogen rate of 72.8 lbs.

White Mold of Soybean Research Trials

Introduction

White mold has the potential to reduce soybean yields. Management options include fungicide use, use of biological products, and cultural products.

Methods

Five fields that had a history of white mold were identified to test two white mold management methods: (1) Cobra®, a herbicide that has some activity against white mold, and (2) Contans®, a biological control agent. Cobra® was applied at growth-stage R1 (July 5) and Contans® was applied April 13. Cobra® and Contans® treatments were compared to a non-treated check within each field. Each field had at least four replications. Replications were set up throughout each location using pre-planned prescriptions developed by Heartland Coop. The untreated equivalent was located immediately next to each treatment management zone. Each field was scouted at least once per month. Early in the season, fields were scouted for apothecia, mushroom-like structures that produce the inoculum. After growth stage R2, each field was scouted for the presence of white mold. Data were analyzed using a statistical software program.

All trials were funded by the Iowa Soybean Association and were completed in partnership with Heartland Coop.

Table 1. Row spacing, planting date, and planting population in white mold studies.

Trial	County	Variety	Row Spacing (inches)	Planting Date	Planting Population
1	Boone	Prairie Brand 2242R2	30	May 7	140,000
2	Story	NK S27-C4	30	May 5	134,000
3	Grundy	AG2430	30	May 18	155,000
4	Story	NK S27-C4	30	May 5	134,000
5	Grundy	CR2502N RR2 Remington	40	June 3	160,000

Table 2. Yields of soybeans in white mold studies.

Trial	Treatment*	Treatment Yield (bu/acre)	Control Yield (bu/acre)	*P*-Value
1	Cobra®	65.8	64.8	0.16
2	Cobra®	64.0	63.3	0.73
3	Cobra®	58.5	56.1	0.22
4	Contans®	62.3	63.1	0.50
5	Contans®	61.4	62.1	0.78

*Cobra® was applied at 6 oz/acre; Contans® was applied pre-planting at 2 lbs/acre.

Summary

Disease

White mold was only reported in the field in Boone County, and it developed late in the growing season. White mold was not observed at the other four locations. Fields were scouted for apothecia (mushroom-like structures that produce the inoculum), but none was found in any location.

Yield

Neither Cobra® nor Contans® had any effect on yield when compared to the control at any of the locations in 2011. There also was no yield penalty for applying Cobra® when white mold did not develop.

Given the growing conditions of 2011, white mold did not develop and treatments were not necessary for white mold management. However, the use of management zones showed how targeting high-risk areas may be an effective approach to manage white mold without the cost of applying products to entire fields.

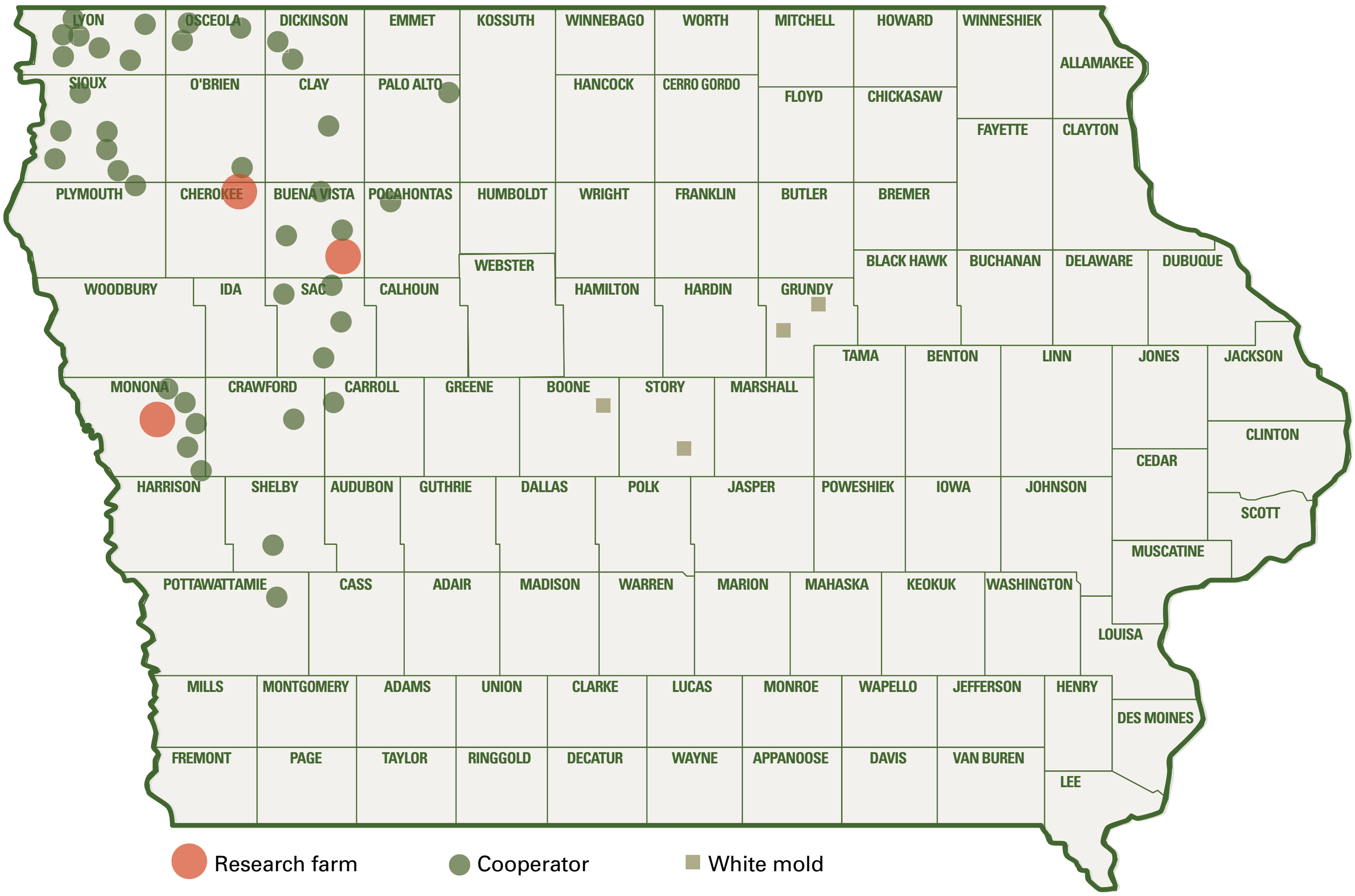
Appendix

Table 1. Product costs, rates, and total cost per acre for fungicide, herbicide, fertilizer, and cultivation practices based on prices in 2011.

Product[a]	Cost/Unit	Rate/Acre	Cost/Acre
Application			
Ground			$6.80
Aerial			$9.80
Fungicides			
Headline®	$300.90/gal	6 oz	$18.79
Quilt Xcel®	$230.00/gal	5 oz (at V5)	$8.98
		10 oz (at VT)	$17.97
Stratego® YLD	$600.00/gal	2 oz (at V6)	$9.38
		4 oz (at VT)	$18.75
Headline AMP™	$544.00/gal	10 oz	$17.00
Herbicides			
Halex® GT	$40.29/gal	3 pints	$15.11
+ Adjuvant	$12.50/gal	1 pint	$1.56
Total			$16.67
Impact®	$19.75/gal	0.75 oz	$14.81
MSO	36.10/gal	19.2 oz	$5.41
Atrazine	4.43/lb	0.5 lb	$2.21
AMS	.2769/lb	2 lb	$0.55
Total			$22.98
Fertilizer			
Sulfur	$0.21/lb	23 lbs	$9.83
Tillage			
Tandem disk			$11.80

[a]Spraying costs are based off 2011 custom rate survey average.

Northwest Iowa and White Mold Research Locations



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We are proud to provide quality information to growers of northwest and western Iowa. Some of the comparisons that we conduct require product, labor, or financial assistance to ensure the success of these projects. We would like to recognize these companies for their support of ISU FARM research. Contact project leaders if you would like to become a sponsor.

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We See More In Your Fields MaxYield Cooperative

Heartland Co-op

Calcium Products Incorporated

Conklin AgroVantage

Iowa Soybean Association
Expanding Opportunities. Delivering Results.

For information on scouting for corn and soybean pests, check out these ISU field guides produced by Iowa State University and the Iowa Soybean Association, available from the Iowa State University Extension Distribution Center Online Store (www.extension.iastate.edu/store or 515-294-5247).

Information in this publication may be specific to Iowa. Those using the publication from outside Iowa should check with their state extension service for local recommendations.

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Extension and Outreach

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