2012

Northeast Research Farm Summary

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Abstract
Includes Farm and Weather Summary, Research Farm Projects and Experiments in Previous Animal Reports.

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2011–2012

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Farm and Weather Summary

Ken Pecinovsky, farm superintendent

Farm Comments

Field days and tours. A total of 1,025 people attended eight field days at the ISU Northeast Research Farm (NERF) in 2011. More than 2,900 people visited the Borlaug Learning Center (BLC). The BLC hosted over 40 events ranging from a 3-day Iowa ag drainage school, to farm land leasing/insurance meetings, livestock extension trainings, and World Food Prize award celebration banquet. The summer field day included information on management of foliar diseases; corn nematodes, water quality, and weather/yield predictions. The fall field day included information on grain drying/storage management, corn hybrid rootworm resistance issues, micronutrients, and weed management.

New projects. Evaluation of humic acid on corn, Dan Olk: Alfalfa management studies, Brian Lang; Corn nematode management, Greg Tylka; and Soybean seed treatments, ISU NERF. An organic soybean aphid control comparison and organic corn variety study were also conducted. Numerous studies looking at tillage, plant populations, and fungicide use (foliar, seed treatment, application timings) in corn and soybeans, were also conducted by Alison Robertson, X.B. Yang, Daren Mueller, and ISU NERF.

Crop Season Comments

Field work began on March 31, with seeding of oat and alfalfa plots. The first planting dates of corn and soybeans occurred on April 2. Nitrogen fertilizer was injected the first week of April, followed by below normal temperatures and 3 in. of rain and 3.4 in. of snow. The majority of the corn planting occurred from May 2 through May 11. The majority of the soybean planting occurred from May 17 through May 24.

Corn harvest began on October 9 and was completed November 2. Corn yields, in general, were above average due to no drought or heat stress. Rain, just prior to (1.67 in.) and during pollination (1.4 in.), reduced crop stress during pollination, when daily high temperatures averaged 89.7^{o}F for the 20 days following the start of corn pollination. Corn yields on rotated acres ranged from 200 to 240 bushels/acre and averaged 220 bushels/acre. Continuous corn yields ranged from 200 to 220 bushels/acre and averaged 205 bushels/acre. Some corn lodging issues were evident at harvest from reduced stalk quality. Soybean harvest began on September 30 and was completed October 19. Soybean harvest was delayed due to slow plant emergence and to the cold soil/air temperatures in early May. Soybean yields were above average, with yields ranging from 55 to 80 bushels/acre and averaged 63 bushels/acre. The high yields were attributed to below economic thresholds of soybean aphids and ample, but not excessive, rainfall and low disease pressure.

Weather Comments

Winter 2010–2011. The first measurable snowfall occurred December 3, 2010 and the last snow for the season was on April 19, 2011 with a total of 52.2 in. recorded (18.25 in. more than the previous winter, mostly from 25.8 inches that fell in December 2010). The 4-in. soil temperature remained below 50^{o}F after October 27, 2010 and the topsoil froze on December 6, stopping any further tillage.

Spring 2011. The frost was out of the top 2 ft of soil after March 20 and the 4-in. average soil temperature remained above 50^{o}F on April 30. Corn and soybeans planted from April 2 through May 2, emerged May 11 through May 13, due to cold soil temperatures from April 14 through May 3.

Summer 2011. Rainfall following planting was ideal, with no major heavy rains, which was ideal for crop development and field operations. Pollination occurred during high heat stress, but 1.67 in. of rain, just prior to pollination, reduced any plant stress. From April through November, 26.04 in. of rainfall was recorded, which was 4.0 in. below the 30-yr average. All rain events were less than 2.0 in., which prevented soil erosion from occurring. September rainfall was below normal, but with August rainfall slightly above average, crop yields were maintained. Corn may have had some plant stress from high temperatures in July, but below normal heat unit accumulation in August and September may have helped grain fill. Corn silage was harvested in early September and physiological maturity of corn occurred in the last week of September, depending on variety maturity. A total of 2,584 heat units were recorded from May through September of 2011 compared with 2,698 in 2010.

Fall 2011. October rainfall was 1.11 in. below normal with only one rainfall event delaying field operations for one day (similar to 2010). There were 268 and 279 heat units in October of 2011 and 2010, respectively, compared with 67 in 2009, which allowed most farmers to use minimal or no liquid propane to dry corn for safe grain storage the past two years. The first plant-killing freeze occurred September 15, with a recording of 27^{o}F, which is about 20 days earlier than the typical frost date for northeast Iowa. The research farm was not affected by this frost, however some localized fields had frost damage, along with northern locations. There was some yield loss in longer maturity soybean varieties or late plantings. Another frost (32^{o}F) on September 24, froze corn and soybean leaf tissue at the research farm. The 4-in. soil temperature remained below 50^{o}F beginning on October 28. Tillage operations were stopped during the first week of December due to rain and frozen soils, however a field drainage tile installer worked through several inches of frost throughout December.

Acknowledgements

We thank the Northeast Iowa Agricultural Experimental Association, ISU researchers and extension staff, and agribusiness people for their support.

Table 1. Monthly rainfall and average temperatures during the 2011 growing season.

	Rainfall (in.)			Temperature (^{o}F)*			
Month	NERF	Departure from normal	No. days of rain	NERF	Departure from normal	Growing degree days	Days 90^{0}F+
April	3.86	+0.21	12	46.3	-1.4	134	0
May	3.84	-0.65	14	58.6	-0.6	354	2
June	4.75	-0.42	11	69.1	+0.5	549	6
July	3.48	-1.33	10	75.8	+3.9	750	10
August	4.60	+0.29	6	69.3	-0.4	601	2
September	2.32	-0.79	6	58.2	-3.6	330	1
October	1.52	-1.11	4	51.9	+2.6	268	0
November	1.67	-0.20	5	38.0	+3.3		0
Total	26.04	-4.0	68	1st hard freeze: 27^{o}F (9/15/11)			21

*133 frost-free days

Research Farm Projects

Research Project/Demonstration	Project Leader
Alfalfa secondary and micronutrient study	B. Lang
Alfalfa nutrient and disease management study	B. Lang
Asparagus variety trial	P. O'Malley
Bt/non-bt corn variety × fungicide study	ISU NERF
Corn "replant" planting date × variety maturity study	R. Elmore
Corn planting date × corn maturities × foliar fungicide study	ISU NERF
Corn planting population × variety study	ISU NERF
Crop N rate × crop rotation study	J. Sawyer
Crop N rate × crop rotation study	A. Mallarino
Crop rotation × fungicide × tillage × planting population study	ISU NERF
Evaluation of corn rootworm insecticides and genetic seed traits	A. Gassman
Evaluation of cover crops and nitrogen rates on corn	J. Sawyer
Evaluation of corn nematode control strategies	G. Tylka
Evaluation of foliar fungicides, application timings, and seed treatments on corn and soybean diseases	A. Robertson X.B Yang
Evaluation of herbicides for equisetum weed control in road ditches	ISU NERF
Evaluation of humic acid and N rates on corn	D. Olk
Evaluation of soybean varieties and soybean fungicide disease control	ISU NERF
Evaluation of soybean aphid and bean leaf beetle insecticides and seed treatments	E. Hodgson
Evaluation of soybean aphid flight populations from a suction trap monitor	E. Hodgson/D. Voegtlin
Evaluation of multiple resistances to soybean aphids	E. Hodgson
Evaluation of water tables, tiling methods, and tile spacing distances	ISU NERF
Evaluation of weed management strategies in corn and soybeans	M. Owen
Home demonstration garden	C. Haynes
Hydrogeology water quality studies in the Devonian Aquifer and near tile drainage	B. Simpkins
Insecticide and fungicide interactions in soybeans	A. Robertson/D. Mueller
Iowa Crop Improvement Association soybean variety trials	J. Rouse
K rate × Bt rootworm isoline comparison study (2 studies)	A. Mallarino
Long-term P-K rate study	A. Mallarino
Long-term tillage × crop rotation studies	M. Hanna/M. Al-Kaisi
Oat variety study	ISU NERF
Organic product evaluation for soybean insect control and yield	B. Lang
Organic corn variety study	B. Lang
Pawpaw tree winter hardiness demonstration	P. O'Malley
Phosphorus rate × P source study	A. Mallarino
Phosphorus and potassium placement and rate in different tillages	A. Mallarino
Rate of lime study	S. Henning
Soil/plant root/soil water observation pit	ISU NERF
Soybean population × fungicide study	D. Mueller

Research Project/Demonstration (continued)	Project Leader
Soybean fungicide and aphid resistant soybean evaluation	D. Mueller
Soybean planting date × variety maturity × insecticide/fungicide study	ISU NERF
Twin Row vs. 30-in. corn variety and population demonstration	ISU NERF
Vertical vs. horizontal tillage study comparison	ISU NERF
Water quality tracing of antibiotics in soils with manure applications	M. Soupir
Water quality from newly constructed bioreactor	M. Helmers
Water quality study (cover crops, crop rotation, fertilizer source/application timing)	M. Helmers

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Amvac Corporation
Asgrow Seed Company
BASF Corporation
Balzer Inc.
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C^{8}MP Crop Consulting
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Dekalb Genetics
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Dennis Weibke
Don Vetter
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Pioneer Hi-Bred International
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Syngenta NK Brand Seeds
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The mention of firm names or trade products does not imply that they are endorsed over other firms or similar products not mentioned.

Northeast Research and Demonstration Farm
3321 290th Street
Nashua, IA 50658

Take the Nashua exit off Highway 27 (218), go 1.2 miles west on Highway B60, then one mile south on gravel (Windfall Ave.), and 0.2 mile east on 290th Street. To schedule a tour, call 641-435-4864.

Experiments in Previous Annual Reports