

# Northeast Research Farm Summary

RFR-A13108

Northeast Iowa Agricultural Experimental Association  
2013–2014

## Executive Board of Directors

President.....	Frank Moore, Cresco
Vice President.....	JoAnn Tupper, Ionia
Secretary .....	Terry Basol, Waverly
Treasurer .....	Bill Lotz, Independence
Board Member .....	Andy Hill, Manly
Board Member .....	Dave Drape, Waverly

## Directors

Allamakee .....	vacant, Erik Nykkanen
Benton.....	Jim Zieser, Dean Williams
Black Hawk.....	Bruce Clark, Craig Sage
Bremer.....	Dave Drape, Mark Mueller
Buchanan.....	Steve Copenhaver, Laverne Lentz
Butler.....	Jeff Reints, Tom Smidt
Cerro Gordo .....	David Newman, Rich Judge
Chickasaw .....	Loren Mattke, JoAnn Tupper
Clayton.....	Ronald Sass, Glenda Plozay
Delaware .....	Chuck Kolbet, Duane Nieman
Fayette.....	vacant, Chad Ingels
Floyd .....	Dennis Carney, George Cummins
Franklin.....	Bruce Behn, Jay Van Wert
Grundy .....	vacant, Fred Abels
Howard.....	Frank Moore, Steve Christensen
Jones.....	vacant
Linn.....	Allan Mallie, John Kintzle
Mitchell.....	Dale McCarthy, Rick Sletten
Winneshiek .....	Paul Hunter, John Rodecap
Worth .....	Andy Hill, Ron Davidson

Research Farm Superintendent .....	Ken Pecinovsky
Research Farm Technician.....	Ralph White
Borlaug Learning Center Administrative Specialist.....	Jeannie Tibbitts
Manager, Research and Demonstration Farms .....	Tim Goode
	103 Curtiss Hall, ISU
Coordinator, Research and Demonstration Farms .....	Mark Honeyman
	103 Curtiss Hall, ISU

## Farm and Weather Summary

Ken Pecinovsky, farm superintendent

### Farm Comments

*Field days and tours.* More than 500 people attended five field days at the ISU Northeast Research Farm (NERF) in 2013. More than 5,000 people visited the Borlaug Learning Center (BLC). The BLC hosted over 100 events ranging from farmland leasing/insurance meetings to agronomy, horticulture, and livestock extension trainings. The summer field day dealt with issues related to our wet spring and subsequent late plantings, with discussions on crop development, nitrogen management, glyphosate-resistant weeds and foliar diseases. The fall field day included information on the wet planting season with discussions on drying and storing wet crops and determining crop maturities, and yield and grain market projections. Soil drainage management was presented during a tile drainage installation demonstration on four acres of untilled ground near the research farm building site.

*New projects.* Evaluation of energy use with field implements and corn dryers, M. Hanna; Evaluation of cover crop mixtures in corn and soybeans, Iowa Learning Farms; Evaluation of in-furrow planter applied products and seed treatments, various researchers; Foliar fungicides and fertilizer/soil amendments in alfalfa, B. Lang.

Numerous studies looking at tillage, plant populations, row spacing, and fungicide use (foliar, seed treatment, application timings) in corn and soybeans were conducted by A. Robertson, X.B. Yang, D. Mueller, and ISU NERF.

### Crop Season Comments

Field work began on April 26 (38 days later than in 2012). On April 28, oat and alfalfa

plots were planted with slow emergence in wet soils following seeding. On May 2, 0.6 in. of rain and 5.1 in. of snow fell, followed by frequent rains until the end of June. The first planting dates of corn and soybeans occurred on April 28 and the next planting 'window' was May 13-19, despite 0.4 in. of rain during that week. Frequent rains only allowed another nine days that were marginally dry to plant and corn/soybean plantings were completed on June 20.

Corn harvest began on October 17 (1 month later than in 2012) and was completed November 11. Corn yields varied according to planting date, but all were above average, mostly as a result of a delayed October 20 frost date that allowed late planted corn to mature. Corn yields on rotated acres ranged from 170 to 230 bushels/acre and averaged 190 bushels/acre. Continuous corn yields ranged from 160 to 200 bushels/acre and averaged 175 bushels/acre.

Soybean harvest began on September 27 and was completed October 24. Soybean yields were good despite late plantings. Late-planted soybeans required an insecticide treatment for aphids. Soybean yields benefitted from 2.65 and 3.29 in. of rain in July and August, respectively. Yields ranged from 50 to 80 bushels/acre and averaged 55 bushels/acre.

### Weather Comments

*Winter 2012–2013.* The first measurable snowfall occurred December 9, 2012, and the last snow for the season was on May 2, 2013, with a total of 37.2 in. recorded (18.5 in. more than the previous winter). The 4-in. soil temperature remained below 50°F after October 20, 2012, and the topsoil froze on December 9 stopping any further tillage.

*Spring 2013.* The frost was out of the top 2 ft of soil after April 29 (7 weeks later than 2012), and the 4-in. average soil temperature remained above 50°F on May 5. Corn and soybeans planted on April 30, began to emerge on May 16. The last killing frost was on May 12 (1 month later than 2012). Frequent rain events allowed three days in April, six days in May, and six days in June to plant crops, despite marginally wet soil conditions that may cause soil compaction issues in 2014. Corn and soybeans planted from May 13-17, with adequate sub-surface tile drainage, had the best final stands and grain yields, due to a 7-day period of warm weather (averaging 83.3°F) causing quick seedling emergence. Fields planted after May 17 had reduced plant stands, due to wet soil conditions where tile drainage was not adequate.

*Summer 2013.* Rain occurred on 14 days in June causing many farmers to never plant all of their crops with several planting cover crops in July and August or leaving the ground bare. In July, measurable rain fell on seven days and above normal air temperatures for the first three weeks helped crops catch up from late plantings. Corn pollination was about three weeks later than normal due to delayed planting. Cooler air temperatures during late July and August caused a slow

grain-fill period, increasing yields despite low rainfall for the rest of the growing season. The soybean yields benefitted from 3.29 in. of August rain and delayed frost date.

*Fall 2013.* Corn silage was harvested in late September and physiological maturity of corn occurred in early October, depending on variety and planting date. A delayed October 20 plant-killing freeze (25°F) allowed late-planted crops to mature. A total of 2,639 heat units were recorded from May through September of 2013 compared with 2,862 in 2012. From April through November, 35.03 in. of rainfall was recorded, which was 5.19 in. above the 30-yr average.

September and October rainfall was 1.95 and 1.19 in. below normal with minimal harvest delays. This was helpful due to the late start of harvest. Delayed planting resulted in wetter corn grain moisture (24-28%) at harvest, requiring more liquid propane fuel to dry corn. The 4-in. soil temperature remained below 50°F after November 1. Topsoil froze on November 22, stopping any further tillage operations.

### 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 2013 growing season.**

Month	Rainfall (in.)			Temperature (°F)*			
	NERF	Departure from normal	No. days of rain	NERF	Departure from normal	Growing degree days	Days 90°F+
April	6.40	+2.82	14	42.2	-5.5	85	0
May	9.92	+5.47	19	58.2	-1.1	344	1
June	8.22	+3.15	14	68.3	-0.6	548	2
July	2.65	-2.06	8	71.7	-0.4	645	10
August	3.29	-0.94	7	70.3	+0.6	615	4
September	1.14	-1.95	7	65.3	+3.5	487	3
October	1.46	-1.19	11	49.7	+0.4	199	0
November	1.95	+0.14	8	32.2	-2.7		0
Total	35.03	+5.44	88	1 <sup>st</sup> hard freeze: 25°F (10/20/13)			20

\*161 frost-free days

## Research Farm Projects

### Research Project/Demonstration

Alfalfa nutrient and management studies  
 Asparagus variety trial  
 Bt trait/corn variety × fungicide study  
 Corn planting date × relative maturity × fungicide study  
 Cover crop mixture studies in corn and soybeans  
 Crop N rate × crop rotation studies  
 Crop N sensing × N rates study  
 Crop rotation × seed treatment × tillage × planting population study  
 Evaluation of energy usage with field implements and corn dryers  
 Evaluation of planter applied in-furrow seed treatment strategies  
 Evaluation of corn rootworm insecticides and genetic seed traits  
 Evaluation of cover crops and nitrogen rates on corn  
 Evaluation of foliar fungicides, application timings, and seed treatments on corn and soybean diseases  
 Evaluation of humic acid and N rates on corn  
 Evaluation of multiple resistances to soybean aphids  
 Evaluation of soybean aphid and seed treatments  
 Evaluation of soybean aphid flight populations from a suction trap monitor  
 Evaluation of soybean varieties and soybean disease/insect control  
 Evaluation of water tables, tiling methods, and tile spacing distances  
 Evaluation of weed management strategies in corn and soybeans  
 Home demonstration garden  
 Hydrogeology water quality studies in the Devonian Aquifer and near tile drainage  
 Insecticide and fungicide interactions in soybeans  
 Iowa Crop Improvement Association soybean variety trials  
 K rate × Bt rootworm isolate comparison study (2 studies)  
 Long-term P-K rate study  
 Long-term tillage × crop rotation studies  
 Nitrogen rates following fall injected swine manure  
 Oat variety study  
 Pawpaw tree winter hardiness demonstration  
 Phosphorus and potassium placement and rate in different tillages  
 Phosphorus rate × P source study  
 Rate of lime study

### Project Leader

B. Lang  
 P. O'Malley  
 ISU NERF  
 ISU NERF  
 E. Juchems  
 J. Sawyer/A. Mallarino  
 J. Sawyer  
 ISU NERF  
 M. Hanna  
 ISU NERF  
 A. Gassmann  
 J. Sawyer  
 A. Robertson/D. Mueller/  
 XB Yang  
 D. Olk  
 E. Hodgson/M. O'Neal  
 E. Hodgson  
 D. Voegtlin  
  
 ISU NERF  
 ISU NERF  
 M. Owen  
 C. Haynes  
 B. Simpkins  
  
 D. Mueller  
 J. Rouse  
 A. Mallarino  
 A. Mallarino  
 M. Al-Kaisi/M. Hanna  
 ISU NERF  
 ISU NERF  
 P. O'Malley  
 A. Mallarino  
 A. Mallarino  
 ISU NERF

**Research Project/Demonstration (continued)****Project Leader**

Soybean planting date × variety maturity × insecticide/fungicide study	ISU NERF
Soybean population × row spacing study	T. Basol
Water quality study (cover crops, crop rotation, fertilizer source/application timing)	M. Helmers/A. Mallarino
Water quality tracing of antibiotics in soils with manure applications	M. Soupir/T. Moorman
Water quality with use of bioreactor	M. Helmers

**Acknowledgements**

The following companies and individuals contributed to research or field day activities at the ISU Northeast Research and Demonstration Farm. Their support is greatly appreciated.

Agrigold Hybrids	Kinze Manufacturing
Agriliance, LLC	Kuhn-Krause Corporation
AMVAC Corporation	Kruger Seed Company
Asgrow Seed Company	MBS Farms / Farmers Feed & Grain
BASF Corporation	Midwest Pipe Supply
Bayer Crop Science	Monsanto Company
C <sup>8</sup> MP Crop Consulting	National Lab for Ag & Environment
CDS-John Blue Company	PCS Fertilizer
Dekalb Genetics	Pioneer Hi-Bred International
Demco-Dethmers Mfg. Company	Plainfield Welding and Repair
Dennis Weibke	Spraying Systems Company
Don Vetter	Stutzman's Incorporated
Gandy Company	Sukup Manufacturing
George Cummins	Swartzrock Implement
Great Plains Manufacturing Co.	Syngenta Crop Protection
ISU Entomology Department	Syngenta NK Brand Seeds
ISU Weed Science Department	Winterhaven Vineyard
Johnson Drainage Plows	Yetter Manufacturing

*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 290<sup>th</sup> 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 290<sup>th</sup> Street.  
To schedule a tour, call 641-435-4864.

### Experiments in Previous Annual Reports

Corn and Soybean Production with a Winter Rye Cover Crop RFR-A1256 .....	ISRF12-13
Antibiotic Resistant Bacteria and Resistance Genes in Crop Fields RFR-A1260 .....	ISRF12-13
Corn and Soybean Potassium Uptake, Removal with Harvest and Recycling To the Soil RFR-A12109 .....	ISRF12-13
Effects of Seed Treatments and a Soil-applied Nematicide on Corn Yields and Nematode Population Densities RFR-A12114 .....	ISRF12-13
Regional Corn Re-plant Recommendations RFR-A11120.....	ISRF11-13
Soybean Planting Dates in Northeast Iowa RFR-A11127 .....	ISRF11-13
Fertilizer and Swine Manure Management Systems Impact Phosphorus in Soil and Subsurface Tile Drainage RFR-A11115 .....	ISRF11-13
Hydraulic Performance of the Denitrification RFR-A11116.....	ISRF11-13
Effect of Sulfur and Boron Fertilization on Alfalfa RFR-A11113 .....	ISRF11-13
Corn Population Research RFR-A10112.....	ISRF10-13
The Suction Trap Network Documents Soybean Aphid Migrations RFR-A10105 .....	ISRF10-13
Phosphorus and Potassium Placement Methods and Tillage Effects on Yield of Corn and Soybean RFR-A10110.....	ISRF10-13
Crop and Soil Responses to Rates of Lime RFR-A9096.....	ISRF09-13
Role of Directly Connected Macropores on Pathogen Transport to Subsurface Drainage Water RFR-A9116 .....	ISRF09-13
Corn Breeding.....	ISRF08-13
Organic vs. Conventional Farming Systems.....	ISRF08-13
Development of Methodologies to Reduce the DCAD of Hay for Transition Dairy Cows .....	ISRF07-13
Sulfur Deficiency in Northeast Iowa Alfalfa Production .....	ISRF06-13
Soybean Yield Influenced by Planting Date and Plant Population.....	ISRF05-13
Effect of Four Tillage Systems and Two Crop Rotations on Placement of P and K.....	ISRF05-13
Evaluation of Hybrid Vigor between Different Alfalfa Varieties .....	ISRF05-13
NO <sub>3</sub> -N Concentrations in Shallow and Deep Groundwater Wells from 1991–2003.....	ISRF04-13
Runoff Phosphorus Loss as Affected by Tillage, Fertilizer, and Swine Manure Phosphorus Management in Corn-Soybean Production Systems.....	ISRF04-13
Legume Identity and Timing of Incorporation Effect on Soil Responses to Green Manure .....	ISRF03-13
Corn Row Spacing, Plant Density, and Maturity Effects .....	ISRF02-13
Excerpts from Keynote Address: ISU NE Research Farm Silver Anniversary Field Day .....	ISRF01-13
Emergence Characteristics of Several Annual Weeds.....	ISRF00-13
Stalk and Ear Diseases in Bt and Non-Bt Corn Hybrids in Northeast Iowa.....	ISRF00-13
Stand Reduction Effects on Corn Grown at High Population Densities .....	ISRF99-13
Row Width and Variety Effects on Soybean Yield .....	ISRF99-13
Transport of Chemicals through Fractures in Pre-Illinoian Till .....	ISRF99-13
Conversion of CRP to Corn and Soybeans.....	ISRF96-13