

Northeast Research Farm Summary

RFR-A1775

Northeast Iowa Agricultural Experimental Association
2017–2018

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103 Curtiss Hall, 513 Farm House Lane, ISU

Farm and Weather Summary

Ken Pecinovsky, farm superintendent

Farm Comments

Field days and tours. More than 600 people attended 11 field days/farm tours at the ISU Northeast Research Farm (NERF) in 2017. More than 3,000 people visited the Borlaug Learning Center (BLC) and NERF. The BLC hosted nearly 60 events ranging from meetings on water quality research to agronomy, horticulture, and livestock/crops extension trainings. The summer field day included information on current issues related to weed and nitrogen management. Cover crops, weather, and yield predictions also were discussed. The fall field day included topics such as grain drying recommendations, crop disease and fungicide use, dicamba weed control issues and crop price projections. Tours of field research were held including the home demonstration garden, water quality research plots, and herbicide, fungicide, and nitrogen rate evaluation studies. A soil drainage management workshop was held with a tile drainage installation demonstration on four acres of land.

New projects. Crop growth modeling, S. Archontoulis; Dicamba resistant soybean herbicide evaluation, M. Owen; and Evaluations of in-furrow products with corn planting dates, ISU NERF.

Crop Season Comments

On April 7 and 10, oat variety plots were seeded and early manure injection treatments were applied in water quality plots, respectively. Anhydrous ammonia-N was applied and urea N rates were hand spread the week of April 10. Corn and soybean research plot planting began April 11 and April 27, respectively. Corn planting was completed May 13 and soybeans May 30.

Corn harvest began October 9 and was completed November 2. Corn yields were above average, and possibly a record, due to adequate rainfall and below normal August temperatures, which provided a slow grain fill period, increasing test weights and yields. Corn yields on rotated acres ranged from 220 to 260 bushels/acre and averaged 230 bushels/acre. Continuous corn yields ranged from 220 to 250 bushels/acre and averaged 225 bushels/acre. Soybean yields were average to above average, except for some late May planted plots, that could have used more rainfall in late August. Minimal sudden death syndrome (SDS) and white mold disease occurred. Soybean aphids did not reach the economic thresholds for control with only 67 and 132/plant recorded September 1 and 14, respectively. Yields ranged from 55 to 75 bushels/acre and averaged 65 bushels/acre.

Weather Comments

Winter 2016–2017. The first measurable snowfall occurred December 3, 2016, and the last snow for the season was March 12, 2017, with a total of 36.4 in. recorded, 11.4 in. less than the previous winter. The average 4-in. soil temperature remained below 50°F after November 9, 2016. Below normal November and December precipitation and frozen top soils kept drainage tiles dry throughout the winter and early spring.

Spring 2017. The 4-in. average soil temperature remained above 50°F on May 3. In April, 15 days were suitable for field work and 13 days had precipitation. The last killing frost was April 28 for sensitive vegetation. In May, 18 days were suitable for field work and 15 days had precipitation. A May 15 hailstorm with 1.26 in. precipitation caused some soil crusting issues and some soybean re-planting. Late May planted soybeans had delayed

emergence issues from 20 days of minimal precipitation.

Summer 2017. July rainfall was 3.57 in. above the 30-yr average, providing ample moisture during corn pollination, despite drought conditions in northwest and south central Iowa. August rainfall was 2.76 in. below the 30-yr average, but air temperatures were 2.8°F below the 30-yr average, which increased corn and soybean yields due to no heat stress during grain fill. September and October air temperatures were 4°F above normal, which helped reduce the amount of artificial drying of corn at harvest.

Corn pollination occurred primarily the week of July 16. Foliar crop diseases were minimal in corn and soybeans. Summer heat units were slightly above normal, which allowed corn to mature prior to frost. Fifteen days in the growing season had air temperatures at or above 90°F with none in August during corn grain fill, resulting in increased corn yields.

Fall 2017. The first killing freeze occurred October 29 (22°F), three weeks later than normal. A total of 2,669 heat units were recorded from May through September of 2017, about 185 less than the previous year. From April through November, 31.83 in. of rain was recorded, which was 1.56 in. above the 30-yr average.

Grain moisture during corn harvest started at 21.7 percent October 9 and was 18.0 percent November 1. Four days of above 90°F temperatures September 21–24 reduced soybean grain moisture levels from 20 percent to 9 percent in two days. The 4-in. soil temperature remained below 50°F after October 24, 2017, with later planted cover crops not able to germinate.

Acknowledgements

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Table 1. Monthly rainfall and average temperatures during the 2017 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	4.31	+0.52	11	50.8	+3.2	176	0
May	4.79	+0.39	12	58.4	-1.1	331	0
June	5.15	-0.48	13	70.9	+1.8	606	7
July	8.35	+3.57	7	72.8	+0.9	698	2
August	1.75	-2.76	8	67.0	-2.8	531	0
September	2.25	-0.75	6	66.4	+4.1	503	6
October	4.86	+2.46	10	53.4	+3.9	250	0
November	0.37	-1.39	6	44.4	+8.8		0
Total	31.83	+1.56	73	1 st hard freeze: 22°F (10/29/17)			15

*183 frost-free days

Research Farm Projects

Research Project/Demonstration

Automated weather station (ISU Mesonet)
 Alfalfa nutrient and management studies
 Asparagus variety trial
 Bt trait/corn variety x fungicide study
 Corn drying energy usage study
 Corn planting date x relative maturity study
 Corn nitrogen rates and tillage in a corn-soybean crop rotation
 Corn head comparison of knife rolls vs. OEM stalk rolls
 Cover crop mixture studies in corn and soybeans
 Crop N rate x crop rotation studies
 Crop rotation x corn variety x tillage x planting population study
 Crop growth modeling
 Corn and soybean planting date x nitrogen rate on corn study
 Evaluation of corn rootworm insecticides and genetic seed traits
 Evaluation of foliar fungicides, application timings, and seed treatments on corn and soybean diseases
 Evaluation of gypsum rates on corn and soybean yields
 Evaluation of fungicide application timings & placement
 Evaluation of in-furrow products and corn planting dates
 Evaluation of seed mixes/mowing on prairie establishment
 Evaluation of soybean aphid flight population monitoring
 Evaluation of soybean aphid foliar and seed treatment insecticides
 Evaluation of water tables, tiling methods, and tile spacing distances
 Evaluation of weed management strategies in corn and soybeans
 Gypsum rate study in corn and soybeans
 Home demonstration garden
 Hydrogeology water quality studies in the Devonian Aquifer
 Iowa Crop Improvement Association corn and soybean variety trials
 K rate x residual soil K studies on corn and soybeans
 Long-term P-K rate study
 Long-term tillage x crop rotation studies
 Milkweed and pollinator species x Monarch butterfly evaluation
 Nitrogen rates following fall injected swine manure
 Oat variety studies
 Pawpaw tree winter hardiness demonstration
 Phosphorus and potassium placement and rate in different tillages
 Phosphorus rate x P source study
 Rate of lime study
 Soybean planting date x relative maturity study
 Soybean seed treatment x disease control studies
 Water quality study (cover crops, crop rotation, fertilizer source/application timing)
 Water quality tracing of antibiotics in soils with manure applications
 Water quality with use of bioreactor

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AMVAC Corporation	MBS Farms / Farmers Feed & Grain
Asgrow Seed Company	Mike Shaw
BASF Corporation	Monsanto Company
Beck's Hybrids	Mitas North America, Inc.
Brian Lang ISU Extension	Potash Corp
C ⁸ MP Crop Consulting	Pioneer Hi-Bred International
Calcium Products, Inc.	Raven Industries
Calmer Corn Heads	Renk Seed Company
Case IH Corporation	Smidt Crop Management, Inc.
CDS-John Blue Company	Sukup Manufacturing
Cropwise Consulting	Swartzrock Implement
Dairyland Seed Company	Syngenta Crop Protection
Dekalb Genetics	Syngenta NK Brand Seeds
Dennis Weibke	Timewell Drainage Products
Gandy Company	USDA National Lab for Ag & Environment
Glen Zubrod	Winfield Solutions, LLC
ISU Weed Science Program	Yetter Manufacturing Company
Johnson Drainage Plows	
John Fox	
Kruger Seed Company	

The mention of firm names or trade products does not imply 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

Phosphorus and Potassium Placement for Corn and Soybeans Managed with Tillage or No Tillage RFR-A1682	ISRF16-13
Field Test for Effects of Cross-Resistance on Root Injury to Bt Corn By Western Corn Rootworm RFR-A1694	ISRF16-13
Denitrification Bioreactor in Northeast Iowa RFR-A1696	ISRF16-13
Corn Yield Response to Nitrogen Fertilizer Application Timing RFR-A1691	ISRF16-13
Enhancing Corn Yield in a Winter Cereal Rye Cover Crop System RFR-A1683	ISRF16-13
Demonstrating Cover Crop Mixtures on Iowa Farmland: Management, Soil Health, and water quality benefits RFR-A1590	ISRF15-13
Best Management Production Input Approach to High Yield Alfalfa RFR-A1583	ISRF15-13
Corn and Soybean Yield Responses to Micronutrients in NE Iowa RFR-A14106	ISRF14-13
Midwest Suction Trap Network RFR-A1492	ISRF14-13
Crop and Soil Responses to Rates of Lime RFR-A14101	ISRF14-13
Long-term Phosphorus and Potassium Fertilization Effects on Yields of Corn and Soybean Grown in Rotation RFR-A14104	ISRF14-13
Evaluation of Soybean Aphid-resistant Soybean Lines RFR-A13111	ISRF13-13
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
Corn Population Research RFR-A10112	ISRF10-13
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
NO ₃ -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
Stand Reduction Effects on Corn Grown at High Population Densities	ISRF99-13
Transport of Chemicals through Fractures in Pre-Illinoian Till	ISRF99-13
Conversion of CRP to Corn and Soybeans	ISRF96-13
Hydrogeology and Water Quality Studies in the Devonian Aquifer	ISRF94-13