Northeast Research Farm Summary

RFR-A2089

Northeast Iowa Agricultural Experimental Association
2020–2021

Executive Board of Directors

President.....John Fox, Charles City
Vice President.....Rick Juchems, Plainfield
Secretary.....Terry Basol, Waverly
Treasurer.....Bruce Clark, Waterloo
Board Member.....Dustin Sage, Dunkerton
Board Member.....Dan Dietz, Nashua
Board Member.....Chuck Kolbet, Manchester

Directors

Allamakee.....David Heitman, Alan Bakkum
Benton.....Jerry Krug, Mark Pingenot
Black Hawk.....Mike Pipho, Dustin Sage
Bremer.....Rick Juchems, Ron Zelle
Buchanan.....Steve Copenhaver, Doug Lentz
Butler.....Dennis Cassman, Phil Pitzenberger
Cerro Gordo.....John Sjolinder, Joe Hanig
Chickasaw.....Cory Kuehn, Dan Dietz
Clayton.....Mike Gaul, Greg Koether
Delaware.....Chuck Kolbet, Larry Swanson
Fayette.....Don Bahe, Susan Massman
Floyd.....Sean Fox, John Fox
Franklin.....Dennis Strother, Dean Dodd
Grundy.....Mark Buskohl, Eric Anderson
Howard.....Barry Christensen, Steve Mahr
Jones.....vacant
Linn.....vacant
Mitchell.....Wayne Sponheim, Eric Jellum
Winneshiek.....Wayne Wangness, Paul Hunter
Worth.....Brian Tweeten, Andy Hill

Research Farm Superintendent.....Ken Pecinovsky
Research Farm Technician.....Ralph White

Associate Dean for Operations.....Mark Honeyman
Farms Manager.....Tim Goode
103 Curtiss Hall, 513 Farm House Lane, ISU

Farm and Weather Summary

Ken Pecinovsky, farm superintendent

Farm Comments

Field days and tours. No ISU Extension meetings or field days were held after March 15, 2020, due to Covid-19 virus precautions. Research studies were conducted as usual with less campus staff involvement. Approximately 1,000 people visited the ISU Northeast Research Farm (NERF) and Borlaug Learning Center (BLC) in 2020. Prior to March 15, we held livestock and crops extension trainings and pesticide and manure recertification classes. Our NEIAEA annual meeting was held March 11 with talks on research on cancer and pesticide usage, tillage and planting tips, and review of 2019 research studies at NERF.

New projects. AMS fertilizer on soybean study, nitrogen fixing bacteria on corn study, lime source and rate study, and barley variety study in no tillage and conventional tillage systems, ISU NERF.

Crop Season Comments

Above normal temperatures allowed planting an oat variety study and seeding alfalfa March 30. Below normal precipitation in April (1.53 in.), especially in the first half of the month, allowed injection of nitrogen fertilizer and manure the first two weeks in April. The last snow fell April 12. The first corn and soybean plantings were April 7 in planting date trials and the majority of corn and soybean plots were planted from April 20 to May 4 (about 3 weeks earlier than normal). There were 15 days of rainfall in May, which did not interfere with field operations, because most farmers had completed planting in April. Only one heavy rain event occurred June 21-22, with 2.85 in. causing some minor flooding. In 2020, the farm received 4.43 in. less rain compared with 2019. July and August were 2.99 and 3.09 in. below normal, respectively, causing drought stress depending on soil type.

Corn harvest began October 5 (2 weeks earlier than 2019) and was completed October 18 due to no rain delays (0.07 in.) and minimal artificial drying time. Corn yields were average to below average due to drought stress from below normal rainfall in July and August. Also, heat stress from August 23-28, with daily high temperatures of 91-95°F, sped up the grain fill period, reducing yield depending on soil type. Corn grain moisture ranged from 14.5-19.5 percent and yields varied immensely across soil types due to the drought and heat stress after pollination. Yields on rotated acres ranged from 150 to 230 bushels/acre and averaged 195 bushels/acre. Continuous corn yields ranged from 140 to 230 bushels/acre and averaged 185 bushels/acre. Soybean harvest began September 21 and was completed October 7. Soybean yields were average to slightly below average, but considerably better than expected, possibly due to early planting and no disease or insect issues. Japanese beetle numbers flared up again in 2020, but less than 2019, and soybean aphids were almost non-existent. Yields ranged from 50 to 65 bushels/acre and averaged 58 bushels/acre.

Weather Comments

Winter 2019–2020. The first measurable snowfall occurred November 6, 2019, and the last snow for the season was April 12, 2020. Total of 33 in. recorded, 16.1 in. less than the previous winter. The average 4-in. soil temperature remained below 50°F after October 22, 2019, and frequent November precipitation delayed our fall manure injection operations until December 6-9, followed by colder weather freezing the topsoil.

Spring 2020. The 4-in. average soil temperature remained above 50°F on April 22 (12 days earlier than 2019). April had 21 days

suitable for field work, with most farmers completing corn and soybean planting in April. The last snowfall and the last killing frost occurred April 12 and May 9, respectively. May had 16 days suitable for field work.

Summer 2020. June rainfall was 0.9 in. above normal with some ponded water in low areas on June 23, but minimal soil erosion because the crop established early. July and August rainfall was 3.0 and 3.1 in. below the 30-yr average, respectively, causing crop stress, and air temperatures were 3.2°F and 1.7°F above normal, respectively. July and August had 5 and 6 days above 90°F (Table 1). Growing degree day accumulation for July and August was 83 and 15 heat units above normal, speeding up grain fill and maturity. September air temperatures and heat units were slightly below normal, which slowed down crop maturity, after above normal progression in July and August.

Corn pollination occurred primarily the week of July 14 (1 week earlier than normal). Foliar crop diseases were minimal in corn and soybean. Summer heat unit accumulation was slightly above normal, which allowed corn to mature prior to frost. Fourteen days in the growing season had air temperatures at or above 90°F (7 days more than the previous year).

Fall 2020. The first killing freeze occurred October 4 (28°F) and a total of 2,760 heat units were recorded from May through September 2020, about 25 heat units more than the previous year. From April through November, 25.8 in. of rain was recorded, which was 4.43 in. less than 2019 and 6.34 in. less than the 30-yr average (Table 1).

Corn grain moisture during harvest stayed in a narrow range of 15-20 percent. Many farmers did not need to artificially dry corn using LP gas. With a wide range of varieties and planting dates on the research farm, we artificially dried corn to 15 percent. Soybean harvest was completed in 17 days with only 0.10 in. of rain occurring in 7 rain events and soybean grain moisture was typically much drier than the ideal 13 percent grain moisture. Corn harvest was completed in 13 days (a record), because of only one rain event and minimal drying time. The 4-in. soil temperature remained below 50°F after October 19, 2020, except for a 3-day warm up starting November 7, helping fall emergence and growth of cover crops drilled after harvest. Fall manure injection occurred from October 30 through November 3, and fall strip tillage was completed November 8. Air temperatures were 5.6°F and 5.3°F above the 30-yr average for November and December 2020, respectively.

Acknowledgements

Thanks to 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 2020 growing season.

	Rainfall (in.)			Temperature (°F)*			
Month	NERF	Departure from normal	No. days of rain	NERF	Departure from normal	Growing degree days	Days 90°F+
April	1.53	-2.40	10	47.4	-0.7	171	0
May	5.36	+0.60	12	59.3	-1.2	340	0
June	6.95	+0.92	10	69.2	+3.7	665	3
July	1.96	-2.99	6	75.0	+3.2	753	5
August	1.48	-3.09	7	71.3	+1.7	625	6
September	5.41	+1.94	10	61.3	-1.5	377	0
October	1.64	-1.09	7	46.0	-3.8	162	0
November	1.47	-0.23	4	40.9	+5.2		0
Total	25.8	-6.34	66	1st hard freeze: 28°F (10/4/20)			14

*148 frost-free days

Research Farm Projects

Research Project/Demonstration	Project Leader
Automated weather station (ISU Mesonet)	D. Herzmann
AMS fertilizer demonstration study on soybeans	On-Farm/M. Witt
Barley variety study in no till and conventional tillage systems	S. Navi
Bt trait/corn variety x fungicide study	ISU NERF
Corn fungicide epidemiology study	A. Robertson
Corn fungicide product and application timing evaluation study	A. Robertson
Corn fungicide product evaluation for disease management	A. Robertson
Corn planting date x relative maturity study	ISU NERF
Corn row spacings, populations, and fungicide products and timings	ISU NERF
Cover crop mixture studies in corn and soybean	E. Ripley
Cover crop species x fall vs. spring seeding on soybean diseases	J. Viggers
Crop modeling–FACTS–Forecast & assessment of cropping systems	S. Archontoulis
Crop N rate x crop rotation studies	A. Mallarino
Crop N rate x crop rotation studies	S. Archontoulis
Crop rotation x corn variety x tillage x fungicide study	ISU NERF
Evaluation of fungicide and application timings on soybean diseases	D. Mueller
Evaluation of lime rates on corn and soybean yields	ISU NERF
Evaluation of seed mixes/mowing on prairie establishment	L. Jackson/J. Meissen
Evaluation of soybean aphid flight population monitoring	D. Lagos-Kutz
Evaluation of soybean Japanese beetle defoliation apps	E. Hodgson
Evaluation of soybean Japanese beetle foliar insecticides	E. Hodgson
Evaluation of water tables, tiling methods, and tile spacing distances	ISU NERF
Evaluation of weed management strategies in corn and soybean	P. Jha
Home demonstration garden	C. Haynes
Iowa Crop Improvement Association corn and soybean variety trials	J. Rouse
Lime rate and source study	A. Mallarino
Long-term P-K rate study	A. Mallarino
Long-term tillage x crop rotation studies	M. Al-Kaisi
Milkweed and pollinator species x Monarch butterfly evaluation	R. Hellmich
Nitrogen rates following fall injected swine manure	ISU NERF
Nitrogen-fixing bacteria demonstration on corn	On-Farm/M. Witt
Oat variety study	PFI
Pawpaw tree winter hardiness demonstration	P. O'Malley
Phosphorus and potassium placement and rate in different tillages	A. Mallarino
Rate of lime study	ISU NERF
Soybean breeding variety evaluation studies	D. Singh
Soybean fungicide product and application timing study	S. Navi
Soybean planting date x relative maturity study	ISU NERF
Soybean planting date x seed treatment evaluation for SDS control	ISU NERF
Soybean planting date x soybean relative maturity	IA Soybean Assoc.
Soybean seed treatment x disease management study	S. Navi
Water quality with use of bioreactor	M. Helmers
Water quality with use of cover crops, crop rotation and nutrient timing	M. Helmers
Winter rye variety study	PFI

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.

Albert Lea Seed House
AMVAC Corporation
Asgrow Seed Company
BASF Corporation
Bayer Crop Science
Brian Lang, ISU Extension
C^8MP Crop Consulting
Calcium Products, Inc.
Calmer Corn Heads
Case IH Corporation
CDS-John Blue Company
Corteva Agriscience
Cropwise Consulting
Dekalb Genetics
Dennis Carney
Dennis Weibke
Duo-lift Mfg.
Gandy Company
Glen Zubrod
EZ Trail Mfg.
Iowa Farm Bureau
ISU Weed Science Program
Johnson Drainage Plows
Jim Johnson
John Fox
Kay Connelly
Kruger Seed Company
Kuhn North America, Inc.
Lois Warme
MBS Farms
Mike Shaw
Monsanto Company
Mitas North America, Inc.
Pioneer Hi-Bred International
Prinsco Inc.
Sukup Manufacturing
Swartzrock Implement
Syngenta Crop Protection
Syngenta Seeds
Timewell Drainage Products
USDA National Lab for Ag and Environment
Wallaces Farmer
Winfield Solutions, LLC
Wyffels Hybrids
Yetter Manufacturing Company

The mention of firm names or trade products does not imply they are endorsed over other firms or similar products not mentioned.

Experiments in Previous Annual Reports