Northeast Research Farm Summary

RFR-A2413

Northeast Iowa Agricultural Experimental Association
2024–2025

Executive Board of Directors

President ..... Tim Burrack, Arlington
Vice President ..... Joe Shirbroun, Farmersburg
Secretary ..... Terry Basol, Waverly
Treasurer ..... Bruce Clark, Waterloo
Board Member ..... Mike Pipho, Dunkerton
Board Member ..... William Long, Cedar Falls
Board Member ..... Cory Kuehn, Ionia

Directors

Allamakee ..... Lynn Stock, Alan Bakkum
Benton ..... Patrick Miner, Larry Nudd
Black Hawk ..... Mike Pipho, William Long
Bremer ..... Mark Mueller, Robert Busch
Buchanan ..... Doug Lentz, Gary Waters
Butler ..... Keith Lovrien, Tom Smidt
Cerro Gordo ..... Richard Judge, Roger Witte
Chickasaw ..... Cory Kuehn, Dan Dietz
Clayton ..... Joe Shirbroun, Philip Meyer
Delaware ..... Allison Bishop, Larry Swanson
Fayette ..... Tim Burrack, Ron Bodensteiner
Floyd ..... Sean Fox, Wayne Koehler
Franklin ..... Philip Long, Dean Dodd
Grundy ..... Mark Buskohl, Fred Abels
Howard ..... Barry Christensen, Frank Moore
Jones ..... vacant, vacant
Linn ..... vacant, vacant
Mitchell ..... Eric Jellum, Ann Johanns
Winneshiek ..... Keith Newhouse, Paul Hunter
Worth ..... Ron Davidson, Andy Hill

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

Associate Dean for Facilities and Operations ..... Kendall Lamkey
Farms Manager ..... Tim Goode
103 Curtiss Hall, 513 Farm House Lane, ISU

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.

Farm and Weather Summary

Ken Pecinovsky, farm superintendent

Farm Comments

Field days and tours. More than 800 people attended 8 extension field day/farm tour events at the ISU Northeast Research Farm (NERF) in 2024. Nearly 2500 people visited the Borlaug Learning Center (BLC) and NERF. The BLC hosted 50 events ranging from a 3 day farm coop new agronomist training event, several seed company informational meetings and plot demonstration events and also a 3 day ag drainage workshop, where we replaced and redesigned a 15 year old bioreactor with new woodchips, as part of the training. Several livestock and crops extension trainings were also held, along with manure and pesticide applicator license trainings. At our March 13th, NEIAEA Annual Meeting, presentations were made on the future of ethanol and sustainable aviation fuel by David Miller, consulting chief economist for Decision Innovative Solutions; an update of the Iowa Nitrogen Initiative and current research findings on short statured corn, by Michael Castellano and Mark Licht, ISU Agronomy department, respectively. A review of 2023 research farm results was also presented during a noon meal, sponsored by Becks Hybrids. The June 19 summer field day included information on crop weather and trend predictions for the 2024 growing season, by Madelynn Wuestenberg, ISU agricultural climatology extension specialist; soil erosion implications in a wet spring and current practices to help minimize its impact, Rick Cruse, Director of the Iowa Water Center; and nitrogen management in a wet spring, Richard Roth, ISU extension nitrogen education specialist. A noon meal was sponsored by Pioneer Hi-bred International. Several weed herbicide trait and planting date demonstration plots were planted for a coop agronomy trainings event. The August 23 fall field day included topics on drone/UAV technology and its use in the ag sector, Doug Houser, digital agriculture extension specialist; update on 2024 crop diseases, Alison Robertson, ISU extension plant pathologist; and tile drainage and water management, Kapil Arora, ISU extension agricultural and biosystems engineering specialist. A noon meal was sponsored by Kahn Tile Supply. Tours of field research studies were held during these field day events and also included a demonstration of drainage tile and bioreactor installation.

New projects. Evaluation of N rates, tillage systems and planting dates on corn hybrid maturities, Sotirius Archontoulis, warm and cool season grass/clover study, Shelby Gruss; cover crop species comparisons in water quality study, Dan Andersen and Raj Raman; relay intercropping rye and soybeans, Mark Licht; soybean yield studies comparing different insecticide groups on soybean aphids and corn yield study comparing in-furrow insecticides, ISU NERF.

Crop Season Comments

Tile drainage sump pumps were re-installed into our 36 – 1 acre water quality plots on April 8, 2024 with minimal to no flow until May 10th when all plots were draining excess soil moisture after receiving 5.35 in. of rainfall in the prior 2 weeks. By August 16th, tile drainage stopped, despite receiving 27.76 in. of rainfall since April 1st, assumily due to a high amount of surface runoff that didn't enter the soil profile. In 2021 and 2022, we produced higher than expected corn and soybean yields, with miminal soil moisture reserves until early to mid-August rainfall events, but in 2023, we stayed moisture deficient throughout the entire growing season with less than 2 inches of rain per month from March through August. In 2024, we had

excessive and frequent rainfall from April through the end of July, that replenished soil moisture reserves, that produced above average corn and soybean yields, but surface runoff caused a lot of early growing season soil erosion.

Nitrogen fertilizer applications began on February 27 and spring manure applications on March 5, due to warm and dry soil conditions. Oat and legume seeding occurred on March 11. In planting date studies, we planted our 1st timings of corn and soybeans on March 20, followed by 19 day planting intervals, ending on June 2. The majority of corn plots were planted April 15 through May 19 and soybean plots were planted from April 23 and completed on June 2 due to numerous May rainfall events. Many farmers completed corn and soybean planting from April 12 through April 25 when soil conditions were dry, however the farmers with a larger amount of acres to cover may not have finished until the end of May or early June, due to 19 days with measureable precipitation from April 26 through May 28.

Grain harvest had very few delays, with only 0.05 and 0.16 in. rainfall during corn and soybean harvest, respectively. Soybean harvest began September 14 and was completed October 5. Soybean yields averaged close to 65 bushels/acre, but grain moisture was 8-11%, due to 14 days above 85 ^{o}F just prior to and during harvest. Corn harvest began September 25 and was completed October 19. Corn yields were above average, despite minimal rain in August and September. Corn yields on rotated acres varied from 200 to 250 bushels/acre and averaged 225 bushels/acre, and continuous corn varied from 185 to 220 bushels/acre and averaged just over 200 bushels/acre. Minimal drying of corn was required due to above normal heat unit accumulation and warmer than normal September and October. Economic thresholds of soybean aphids did appear in late July in small infested hotspots that resulted in a 3.5 to 4.5 bushel/acre yield advantage when sprayed with non-pyrethroid insecticides. Due to the fairly dry latter half of July and August, minimal to no corn and soybean diseases occurred, similar to the past few years. Southern rust was the main non-yield limiting factor observed during the growing season and tar spot only showed up during corn physiological maturity. Corn rootworms on continuous corn rotation had areas above economic thresholds, but not as severe as in the drought of 2023. Very little yield variation occurred, across soil types in 2024 as compared to the previous 3 years, due to above normal precipitation from April through July.

Cover crops seeded in October had slow and spotty emergence due to no rain events until October 30, but did finally emerge evenly by mid-November after 3.57 in. of rain in 8 rain events. Fall manure injection, fall fertilizer applications and tillage operations were completed from October 30 through November 18. Water quality pumps and meters were removed November 19th since the 6.09 in. of rainfall since August 16th was not enough to produce any excess soil moisture to produce tile drainage.

Weather Comments

Winter 2023–2024. Following an extremely dry 2023 growing season (8.18 in. rain from April 1 through September 15), we finally started to receive some much needed rainfall to start replenishing soil moisture reserves (6.68 in. from September 16 through December 31, 2023). However winter snowfall (15.5 in.) and rainfall (2.84 in.) through the end of March 2024 was below normal with no tile drainage flow. April through July of 2024 had excessive rainfall with several surface flooding events, followed by minimal rainfall again through the end of December 2024.

The average 4-in. soil temperature remained below 50°F after October 28, 2023. The first measurable snowfall occurred November 25, 2023, and the last snow for the season was April 3, 2024, with a total of 15.5 in. recorded (24.8 in. less than the previous winter). November and December of 2023 had 1.32 in. of rainfall and 2.5 in. of snow. We received 13.0 in. of snow in spring of 2024 for a total water equivalent of 1.67 in. for the winter season which was not enough to get the soil moisture profile replenished for the 2024 growing season.

Spring 2024. The last killing frost occurred on April 21. The 4-in. average soil temperature remained above 50°F on April 23. Both, April and May each had 12 days suitable for field work.

Summer 2024 . May, June, and July rainfall was +4.51, +3.79, and +0.66 in. above the 48-yr farm average. May, June, August and September average daily air temperatures was +2.4, +2.3, +1.1, and +4.3°F above the 48-yr farm average, respectively. Crop stress was not an issue in 2024, compared to the past 3 dry growing seasons, due to only 14 days of air temperatures above 90 °F from May through October (14 less than 2023). July air temperature was -0.28 °F, from the 48-yr farm average, also relieving any chance of crop stress during pollination. Corn pollination occurred between July 13-24, when the daily high temperatures averaged 82.6 °F, and through the end of the month, averaged 83.1 °F.

Fall 2024. The first killing freeze occurred October 15 (27°F). A total of 2,864 heat units were recorded from May through September of 2024, 56 less than the previous year, and 201 more than the past 30 year average. From April through November, 34.21 in. of rain was recorded, which was 20.38 in. more than 2023 and 3.87 in. more than the 48-yr research farm average. (Table 1)

The 4-in. soil temperature remained below 50°F on November 6, 2024. The soil surface was frozen most of December and some strip tillage was completed on December 31 in a brief warm spell. Soil moisture reserves are still deficient, due to only 5.97 in of precipitation from September through December and no measurable precipitation fell in January of 2025 resulting in a soil moisture deficit going into the 2025 growing season.

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 2024 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	4.34	+0.76	13	49.82	+2.34	187	0
May	8.95	+4.51	15	61.96	+2.36	403	1
June	9.09	+3.79	10	71.50	+2.31	631	4
July	5.08	+0.66	12	71.95	-0.28	663	2
August	2.40	-2.37	7	70.94	+1.13	649	3
September	0.22	-3.24	4	66.96	+4.26	518	3
October	1.00	-1.66	1	56.80	+7.34	344	1
November	3.13	+1.41	9	39.30	+4.17		0
Total	34.21	+3.87	71	1st hard freeze: 27.0°F (10/15/24)			14

*176 frost-free days

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
BASF Corporation
Bayer Crop Science
Beck's Hybrids
Blackhawk County Extension Council
Calcium Products, Inc.
Calmer Corn Heads
Corteva Agriscience
Cropwise Consulting
Dennis Carney
Dennis Weibke
Farm Credit Services of America
FMC
Growmark
Iowa Farm Bureau
ISU Weed Science Program
ISU Ag & Biosystems Engineering
IAS Coop/Land O'Lakes
Johnson Drainage Plows
Jim Johnson
John Fox
C8MP/Kay Connelly
Kahn Tile Supply
Luana Savings Bank
Lois Warme
MBS Farms
Mike Shaw
Mitas North America, Inc.
Nutrien Ag Solutions
Pioneer Seeds
Prinsco Inc.
Smidt Crop Management
Sukup Manufacturing
Syngenta Crop Protection
Syngenta Seeds
USDA NLAE
Unverferth Mfg.
Wallaces Farmer
Winfield Solutions, LLC
Wyffells Hybrids
Wolfe Equipment

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

Research Projects List

Research Project	Project Leader
Rate of Lime study	ISU NERF
Long Term P-K Rate study	ISU NERF
Crop Rotation-Nitrogen fertility study (0, 80, 160, 240 N/ac)	A. Mallarino
Crop Rotation-Nitrogen study (0, 50, 100, 150, 200, 250, 300 N/ac)	S. Archontoulis
Evaluation of AMS, S, N & N fixation product on soybeans	ISU NERF
Evaluation of a N rates, tillage, plant date and corn variety maturities	S. Archontoulis
Evaluation of N rates (0, 75, 150, 225, 300, 600N/ac) on corn/soil properties	M. Castellano
Evaluation of N rates (0, 60, 120, 180 N/ac) x N fixation biologicals	ISU NERF
Evaluation of nutrient/micronutrient and biological seed treatments	ISU NERF
Evaluation of N fixation product seed treatments & N rates on corn	ISU NERF
Evaluation of nitrogen byproduct vs. commercial fertilizer on corn	D. Anderson
Evaluation of weed management strategies in corn	W. Everman
Evaluation of weed management strategies in soybeans	W. Everman
Evaluation of corn rootworm seed traits & insecticides	A. Gassmann
Evaluation of corn rootworm seed traits and infurrow insecticides	ISU NERF
Evaluation of biological fungicides on soybean diseases	D. Mueller
Evaluation of fungicide treatments in soybeans (multi-state project)	D. Mueller
Evaluation of foliar insecticides for soybean aphid control	ISU NERF
Evaluation of foliar fungicides on alfalfa	ISU NERF
Evaluation of foliar insecticides on alfalfa	ISU NERF
Evaluation of foliar fungicides and application timings on corn	A. Robertson
Evaluation of fungicide timing on corn hybrids varying in tar spot resistance	A. Robertson
Soybean aphid suction trap (weekly flight catches)	Doris Lagos-Kutz
Soybean insect trapping for insecticide resistance lab studies	E. Hodgson
Evaluation of fungicides and insecticides on soybean	ISU NERF
Evaluation of corn hybrids on Csb, CC, and 4 tillage systems	ISU NERF
Black cutworm & true army worm pheromone trapping	E. Hodgson
Herbicide symptomology x incorrect herbicide usage demonstration	ISU NERF
Cover crop rye termination date x soybean yield	ISU NERF
Corn rootworm trait x infurrow insecticide field day demo.	ISU NERF
Impact of manure, N-system, cover crops and tillage on water quality	D. Raman M. Helmers
Evaluation of bioreactor on water quality	D. Andersen, M. Helmers L. Christianson
Poa Bulbosa evaluation as a cover crop in corn/soyb rotations	D. Andersen
Evaluation of water quality from 4 CREP wetland sites in NE IA	B. Crumpton
Evaluation of water tables, tiling methods, distances	ISU NERF
Evaluation of water tables in varying aquifers/depths	IA Geological Survey
Hydrogeologic evaluations of soils in 0-65 ft. depth piezometers	IA Geological Survey
Corn planting date x hybrid maturity (3 maturities & 5 plant dates)	ISU NERF
Soybean planting date x variety maturity (3 maturities & 5 plant dates)	ISU NERF
Soybean planting date x seed treatments (2 st's & 4 plant dates)	ISU NERF

Oat variety performance study (16 varieties)	PFI
Rye variety performance study (14 varieties)	PFI
Wheat variety performance study (6 varieties)	M. Licht
Corn variety x R1 fungicide study (36 varieties)	ISU NERF
Soybean RR® variety x R3 insecticide study (26 varieties)	ISU NERF
Forage grass study with cool & warm season crops (5 var, 2 timings)	S. Gruss
Soybean breeding research study	D. Singh
Prairie mix establishment and grass suppression study	UNI/Justin Meissen
Short statured corn variety x fungicide timing study	ISU NERF
Soybean row spacing study (10 in, 15 in, 30 in)	ISU NERF
Long term tillage system/crop rotation study	ISU NERF
Soybean yield determination-recording nodes, pod, seeds, etc.	ISU NERF
Cover crop rye planting date x population relay intercropping soybeans	M. Licht
Relay intercropping soybean variety maturities & populations into rye	M. Licht
Nitrogen sidedress rates after fall injected swine manure	ISU NERF
Home demonstration/food bank donation garden	ISU NERF/Extension
Windbreak shrub, asparagus cultivar, paw paw and apple cultivars	P. O'Malley
NWS precipitation & air/soil temperature data collection	ISU NERF
ISU Environmental Mesonet (Automated weather stations across Iowa monitoring air/soil temps, relative humidity, solar radiation, wind speed & soil moisture at varying depths)	ISU