Northeast Research Farm Summary

RFR-A1964

Northeast Iowa Agricultural Experimental Association
2019–2020

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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 725 people attended 12 field days/farm tours at the ISU Northeast Research Farm (NERF) in 2019. Almost 3,500 people visited the Borlaug Learning Center (BLC) and NERF. The BLC hosted 75 events including a meeting, tour, and supper with the new Dean Daniel Robison, College of Agriculture and Life Sciences, and meetings on agronomy, horticulture, and livestock/crops extension trainings. The summer field day included information on small grain production, plant diseases, weather predictions, and implications of future legalization of hemp production. The fall field day included topics on crop marketing planning, weed management, corn and soybean insect issues, and current research results on long-term P and K soil fertility studies. Tours of field research were held including the home demonstration garden, water quality research plots, plant protectant products, and fertilizer rate evaluation studies. A 3-day soil drainage management workshop was held with a tile drainage installation demonstration on four acres of land.

New projects. Corn fungicide application timing studies on Tar Spot control, A. Robertson; Japanese beetle defoliation and insecticide study, E. Hodgson; Soybean variety/disease evaluation following fall vs. spring drilled oats, rye and wheat, S. Eggenberger; Cereal winter rye variety yield study, PFI; Soybean seed treatments for sudden death syndrome, S. Navi and NERF.

Crop Season Comments

Frequent precipitation in April (3.77 inches in 15 days) delayed and limited early spring field work. The last snow fell April 28 and nitrogen applications began April 17. On April 9, oat variety plots were seeded. Early manure injection treatments were applied in water quality plots April 15-16. The first chance of planting in dry soils was April 21, although due to frequent rain, the majority of corn and soybean plots were planted starting May 4 and completed May 15 for corn and June 1 for soybean. There were 11 days of rainfall in May delaying field work. Only two heavy rain events occurred in the growing season of 2019: May 18 (1.93 in.) and May 24 (1.52 in.), compared with 2018, when there were eight heavy rain events (over 2 in.) in four months. In 2019, the farm received 22.06 in. less rain compared with 2018.

Corn harvest began October 20 (3 weeks later than 2018) and was completed November 10. Corn yields were above average, due to optimal heat unit accumulation, lower temperatures during grain fill, and optimal, but not excessive rainfall. Corn grain moisture ranged from 18.0-23.0 percent and yields on rotated acres ranged from 210 to 255 bushels/acre and averaged 235 bushels/acre. Continuous corn yields ranged from 180 to 240 bushels/acre and averaged 220 bushels/acre. Soybean harvest began September 23 and was completed October 18. Soybean yields were average to slightly below average with shorter plants that never reached full canopy. Minimal sudden death syndrome (SDS) and white mold disease occurred. Japanese beetle numbers flared up again in 2019, but soybean aphids were almost non-existent. Yields ranged from 50 to 65 bushels/acre and averaged 58 bushels/acre.

Weather Comments

Winter 2018–2019. The first measurable snowfall occurred October 14, 2018, and the last snow for the season was April 28, 2019, with a total of 49.1 in. recorded, 1.7 in. more than the previous winter. The average 4-in. soil

temperature remained below 50°F after October 20, 2018, and fall tillage and manure injection operations were not completed due to frequent rain or snow events and/or frozen soils after November 4.

Spring 2019. The 4-in. average soil temperature remained above 50°F on May 4. April had only nine days suitable for field work. The last snowfall and the last killing frost occurred April 28. May had 14 days suitable for field work.

Summer 2019. June, July, and August rainfall was 3.1, 1.5, and 2.1 in. below the 30-yr average, respectively, but crop water use requirements were met, since no excessive heat events occurred. GDD accumulation for August was slightly below normal and September above normal, allowing crops to mature slowly, which increased yields. September temperatures were 5.5°F above normal, which helped reduce the amount of artificial drying of corn at harvest.

Corn pollination occurred primarily the week of July 21. Foliar crop diseases were minimal in corn and soybean, with a slight increase in corn disease in late August with some newly found Tar Spot disease symptoms. Summer heat unit accumulation was slightly above normal, which allowed corn to mature prior to frost. Seven days in the growing season had air temperatures at or above 90°F (12 days less than the previous year) with none in August during the corn grain fill period, resulting in increased corn yields.

Fall 2019. The first killing freeze occurred October 12 (27°F), the same day as 2018. A total of 2,735 heat units were recorded from May through September 2019, about 220 heat units less than the previous year. From April through November, 30.23 in. of rain was recorded, which was 22.06 in. less than 2018 and 1.46 in. less than the 30-yr average.

Corn grain moisture during harvest stayed in a narrow range of 21-22 percent, due to frequent rain events and below normal solar radiation and heat units to dry the grain down further. Eleven days of rainfall during soybean harvest caused delays since soybean grain moisture levels were difficult to get down to 13 percent. The 4-in. soil temperature remained below 50°F after October 22, 2019, with minimal fall growth of cover crops, drilled after crop harvest. Frozen or wet soils delayed fall manure injection until the first week of December and fall strip tillage was completed December 27. Air temperatures were 6.6°F and 4.2°F above the 30-yr average, for December 2019, and January 2020, respectively.

Acknowledgements

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Table 1. Monthly rainfall and average temperatures during the 2019 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	3.77	-0.13	14	48.8	+1.4	173	0
May	6.32	+1.68	11	57.0	-2.4	299	0
June	2.89	-3.10	14	69.3	+0.2	575	2
July	3.46	-1.45	14	74.4	+2.6	738	4
August	2.50	-2.06	8	68.5	-1.1	582	0
September	3.94	+0.54	16	67.9	+5.5	541	1
October	5.20	+2.56	10	46.5	-3.4	132	0
November	2.15	+0.50	15	31.3	-4.3		0
Total	30.23	-1.46	102	1st hard freeze: 27°F (10/12/19)			7

*167 frost-free days

Research Farm Projects

Research Project/Demonstration	Project Leader
Alfalfa nutrient and management studies	B. Lang
Automated weather station (ISU Mesonet)	E. Taylor
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. (Juchems) Ripley
Cover crop species x fall vs. spring seeding on soybean diseases	S. Eggenberger
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 gypsum rates on corn and soybean yields	A. Mallarino
Evaluation of liquid K applications in corn and soybean	A. Mallarino
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
Hydrogeology water quality studies in the Devonian Aquifer	B. Simpkins
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
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 seed treatment x disease management study	S. Navi
Water quality with use of bioreactor	M. Helmers
Winter rye variety study	PFI

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C[8]MP Crop Consulting
Calcium Products, Inc.
Calmer Corn Heads
Case IH Corporation
CDS-John Blue Company
Corteva Agriscience
Cropwise Consulting
Dairyland Seed Company
Dekalb Genetics
Dennis Carney
Dennis Weibke
Gandy Company
Glen Zubrod
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ISU Weed Science Program
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Lois Warme
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Mitas North America, Inc.
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Pioneer Hi-Bred International
Prinsco
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Yetter Manufacturing Company

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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