

Northwest Research Farm Summary

RFR-A1826

Northwest Iowa Experimental Association

2018–2019

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 103 Curtiss Hall, ISU

Northwest Farm and Weather Summary

Terry Tuttle, farm superintendent

Farm Comments

Developments. The staff at the Northwest Research Farm (NWRF) has remained stable with no changes the past year. The sale of an approximate 5-acre parcel of the Doon farm was finalized, which reduces the size of the Doon farm to 57.05 tillable acres.

Equipment purchased for the NWRF in 2018 include an Avery Weigh-Tronix 4 ft x 4 ft platform scale with 10,000 lb capacity, purchased from Vande Berg Scales in Sioux Center, Iowa, and installed in the new shop. This allows the farm to purchase fertilizer materials such as 0-46-0, gypsum, and pel-lime in bulk containers and accurately measure these for application to research plots. A used Mitsubishi 5,000 lb forklift also was purchased for safer handling of bulk fertilizer bags, pallets of seed, and other heavy lifting. It also allows greater utilization of the pallet racking storage system installed in the new shop.

A total of 38 research projects were conducted in 2018. Seven of these projects were new to the farm. The research farm planted and harvested over 1,968 individual plots, and 35 on-farm trials were conducted on cooperating farmers' fields in the area.

The ISU Demonstration Garden, in Rock Rapids, supported by ISU Lyon County Extension and Outreach, Northwest Iowa Experimental Association, and the ISU Northwest Research Farm continues to be an attraction at the Lyon County fairgrounds. The garden was used as a pantry garden for the third year in a row. All produce harvested from the garden went towards helping fight hunger in Northwest Iowa, with the produce

donated to food pantries in Lyon, Sioux, O'Brien, and Osceola counties. A theme in this year's garden was "planting the rainbow," with the vegetables ranging in colors such as pink tomatoes, purple snap peas, yellow cauliflower, and orange winter squash.

Field days and tours. There were 10 field days held by the Northwest Research Farm. A total of 1,471 visitors attended field days or other events at the research farm in 2018.

New projects. Aphid resistant soybean screening (HPR), J. Hohenstein; Corn fungicide efficacy, A. Robertson; Corn silage variety trial, F. Hall and B. Doran; 7-rate nitrogen trials, corn on corn and corn on bean, N. Mahal and M. Castellano; Xtendimax vs. Liberty soybean strip trial, NWRF staff and J. McDermott; Weed science herbicide demonstration, D. Franzenburg.

Crop Season Comments

Corn planting was scheduled to begin April 10, however, with cold conditions and persistent snow cover into late April corn planting was delayed until April 30 and completed June 1. Corn harvest began October 2 and was completed October 30. Overall farm corn yield was 186 bushels/acre and continuous corn yielded 208 bushels/acre.

Soybean planting also began April 30 and was completed June 1. Soybean harvest began September 27 and was completed October 24. Overall farm soybean yield average was 65.5 bushels/acre.

Weather Comments

Spring 2018. The soil moisture profile at the farm started the season nearly full. This was compounded with late snow April 18 (6-10 in.), cool conditions, and poor drying weather,

which led to a prolonged planting season. Temperatures began to warm up late-April bringing the 4 in. soil temp to 50.4°F April 24. May brought persistent rainfall along with warmer temperatures. During the month of May, the NWRF received measurable precipitation on 16 of the 31 days with four days being the longest stretch without precipitation. Soil conditions remained wet and marginal for planting. May 23 was the first time staff was able to get into some plots to perform fertilizer application or pre-plant tillage operations. The last seven days of May brought a heat wave with five of those seven days having a high temp over 90°F, one of those over 100°F. Lower rainfall totals allowed staff to make progress and complete planting June 1. Although some planting conditions were not optimum, adequate moisture and high temps led to rapid emergence for the later-planted crops.

Summer 2018. In 2018, the NWRF received no major rainfall event (> 5.0 in.) in any month. June was moderately warm and moist (83°F avg. daily high + 6.44 in. rain). July had moderating temperatures and precipitation. The average high temperature for the month was 83°F and total rainfall was 3.02 in. This combination provided an optimum environment for crops during the critical reproductive stages.

Soybean aphids were present in areas but struggled to reach threshold with some plots being sprayed later in the season. Disease pressure was low with no major problems noted. One new insect pest was Gall Midge Larvae infesting bean plants. This new pest was in every plot of beans on the farm. The majority of plots did not have a significant, yield-reducing population, however there was a 30 percent reduction in yield in one of the trials due to Gall Midge Larvae damage. Moderate rainfall in the second half of August, along with moderate temperatures, allowed for a little longer grain fill in corn and some new growth and pod fill in soybeans.

Fall 2017. The first killing frost was October 15. At that point, the soybeans and most of the corn were past physiological maturity. Once soybean harvest began September 27, the research farm received 17 days with measurable precipitation during the harvest season, which also was unseasonably cool. November continued to bring intermittent precipitation and unseasonably cool temps, making soil testing and fieldwork difficult. The staff finished soil sampling and fertilization, however fell short of the fall tillage fieldwork goal. Due to a higher-than-normal rainfall total for 2018 (+5.76 in.), drainage in the tile water quality study continued to flow until it was shut down for the season November 30.

Acknowledgements

The Northwest Iowa Experimental Association and ISU Extension and Outreach are commended for their support of the Northwest Research Farm. Support of field days, speakers, and new ideas are vital to the research farm's successes. Appreciation also is extended to the following entities for their support of research projects or ideas at the farm.

AMVAC
 Beck's Seed
 DuPont Crop Protection
 DuPont Pioneer Seed
 Monsanto Seed
 Monsanto Crop Protection

Security State Bank
 Farm Bureau, Sioux County
 Farm Bureau, Lyon County
 Ag Partners
 Farm Nutrients
 Farmers Coop Society
 Legend Seeds
 CS Agrow
 GSI
 Calcium Products
 Sickelka Ag

Table 1. Northwest Research and Demonstration Farm, Sutherland, monthly rainfall and average temperatures for 2018.

Month	Rainfall (in.)		Temperature (°F)		Days 90° or above
	2018	Deviation from normal*	2018	Deviation from normal	
April	1.50	-1.19	36.4	-10.7	0
May	4.37	0.42	65.1	6.1	5
June	6.44	1.82	72.2	3.2	6
July	3.02	-0.44	71.5	-0.5	2
August	4.16	0.17	69.4	-0.3	0
September	8.24	4.99	63.6	1.6	1
October	<u>2.11</u>	<u>-0.01</u>	44.9	-4.4	<u>0</u>
Totals	29.84	5.76			14

*Rainfall averages recalculated based on data from 1957-2017.

**Temperature averages recalculated based on data from 1988-2017.

Research Projects at Sutherland

<u>Research Project</u>	<u>Project Leader</u>
7 Nitrogen rate trial, corn on corn	M. Castellano/N. Mahal
7 Nitrogen rate trial, corn on bean	M. Castellano/N. Mahal
AMVAC Insecticide trial	NWRF Staff
Aphid resistant soybean screening (HPR)	J. Hohenstein
Asparagus variety trial	NWRF Staff
Corn fungicide efficacy trial	A. Robertson
Corn fungicide efficacy x application/360 Undercover	A. Penney/ J. Viggers
Corn fungicide efficacy x timing	A. Robertson
Corn planting date comparison	M. Licht
Corn row spacing x population trial	NWRF Staff/M. Licht
Corn silage variety trial	F. Hall/B. Doran
Corn tillage system x nitrogen rate project	J. Sawyer
Corn yield forecasting trial	M. Licht/S. Archontoulis
Demonstration garden, Rock Rapids	C. Haynes
Demonstration windbreak	J. Randall
Herbicide comparison demonstration	NWRF Staff
Iowa Crop soybean variety test	J. Rouse
Long-term nitrogen rate study	J. Sawyer
Long-term tillage and carbon sequestration	M. Al-Kaisi
Miscanthus establishment evaluation	E. Heaton
Monarch habitat project	S. Applegate
Moth trapping – Black cutworm (BCW)	A. Dean
Moth trapping – European corn borer (ECB)	A. Dean
Moth trapping – True armyworm (TAW)	A. Dean
NCSRP soybean trial	A. Dean
Planting variability demonstration	NWRF Staff
Soybean aphid efficacy trial	E. Hodgson
Soybean aphid resistant RIB trial	J. Hohenstein
Soybean aphid suction trap	E. Hodgson
Soybean fungicide comparison	D. Mueller/ S. Wiggs
Soybean planting date comparison	M. Licht
Soybean row spacing x population trial	NWRF Staff/M. Licht
Soybean yield forecasting trial	M. Licht/S. Archontoulis
Surface runoff study	A. Mallarino/M. Helmers
Surrogate nitrate measurement methods (lysimeters)	G. Birru
Tile water quality study	M. Helmers/J. Sawyer
Tillage x fertilizer placement study	A. Mallarino
Water table monitoring	NRCS
Weather station	NWRF Staff
Weed/Dicamba herbicide demonstration	P. Kassel
Weed science herbicide demonstration	D. Franzenburg
Xtendimax/Liberty soybean strip trial	Monsanto/NWRF Staff

Allee Demonstration Farm Summary

Lyle Rossiter, farm superintendent
Allee Demonstration Farm

Farm Comments

Developments. Nitrogen management is a high priority on the ISU Allee Farm. Fall strip trials of cover crops with cereal rye and oats have been implemented without yield losses. Spreading cattle manure with a vertical spreader provides even distribution of nutrients and allows cover crops to grow through the residue. Side dressing liquid nitrogen on corn in June has decreased total nitrogen fertilizer use by 50 percent without reducing yield.

The implementation of cooperator on-farm trials continues. ISU staff assisted individual farmers in setting up field-length strip trials and collecting data for statistical analysis. Extension crop specialist Paul Kassel, and Allee Farm superintendent Lyle Rossiter, assisted with several field projects.

The soil over the Dakota Access Pipe Line holds water and is too wet to farm. Two tile lines will be installed to restore the soil drainage.

Events. A fall grazing cover crop tour was held in Sac and Buena Vista counties December 3. Beth Doran, (beef specialist), Paul Kassel and Mike Witt, (crop specialists) traveled to three farms with 20 guests and answered questions as landowners talked about their cover crop grazing experiences. Paul Kassel, Mike Witt, and Lyle Rossiter gave presentations on grazing, cover crops, and livestock improving soil tilth. Also discussed were live green plants growing 365 days a year, increased soil microbial activity, earth worms, and holding nitrates in the soil profile for corn and soybean growth later in the summer.

The Allee Farm hosted Ag-Citing Days with topics of soil science, amazing corn, Monarch butterflies, corn ethanol, and buzzing with bees. Also, 4-H youth presented talks on their live beef, goat, rabbit, and swine projects to 400 fourth-grade students from across Buena Vista County.

Safety day for 200 third-grade students included topics of chemical liquids, ambulance tour, first aid, sheriff car tour, home alone, sun exposure, bicycles, electrical, and farm equipment safety.

The Buena Vista and Pocahontas counties special swine class was held in June, with 27 4-H youth participating in an educational day and showing live market pigs before the fairs.

The Allee Farm appreciates the community support and the opportunity to be an educational site for all ages and families. A total of 735 guests visited the farm, and the Allee Historical Mansion hosted 1,090 visitors.

Projects. The fourth year, of the long-term assessment of miscanthus productivity and sustainability (LAMPS) is in full production on 10 acres on three ISU farms. The biomass plantings will be researched to learn how to grow and maintain miscanthus at a farm scale.

The third year of the spring grazing cover crop study did not produce enough cereal rye growth for grazing. The rye was drilled in fall 2017. Cold and dry soil conditions slowed rye growth. Data on soil health, compaction, and rye production was collected.

A new fall grazing cover crop was started in August with an airplane broadcasting oats over the 32-acre rye cover crop.

The oats and rye grew in standing corn. After corn harvest, the oats, rye, and cornstalks were grazed by 46 heifer calves.

Adam Dixon, PhD student, University of Maryland, studied landscape and soundscape noises with a bioacoustic device attached to a fence post. The recordings of insect, bird, and environmental sound recordings will be compared with vegetation growth in the area.

Livestock. The Allee Farm backgrounded 105 head of cattle and grazed them on cereal rye cover crops in the spring. The farm custom-fed 156 head of cattle in the fall and collected research data for the purebred Angus cowherd at the ISU McNay Research Farm, Chariton, Iowa.

A trial with 36 heifer calves by Dan Loy, Stephanie Hansen, and Erika Lundy (ISU Animal Science department) studied the performance of copper/estrogen.

The automated weather station was installed in the northwest corner of the farm in fall 2014. At that time, above-ground data collection began on wind speed, wind direction, high and low temperature, humidity, and solar radiation. Below-ground soil probes monitor soil moisture and temperature at 4, 12, 24, and 50-in. depths. Data collected is available as part of the ISU Mesonet at mesonet.agron.iastate.edu under Iowa Ag Climate Network.

Crop Season Comments

Corn planting was finished May 19. Harvest was completed October 30, with average yields of 202 bushels/acre.

Soybean planting was finished June 1. Harvest was completed October 23 with average yields of 57 bushels/acre.

Weather Comments

Winter. January's highest temperature was 52°F and a low of -24°F with a snow and ice storm on January 21-22. The first 12 days of February were cold with a low temperature of -15°F and above average temperatures the last two weeks. March temperatures were below average except for the last 11 days with a high of 58°F. Cool and dry conditions slowed cover crop growth.

Spring. April was warm and dry allowing corn to be planted April 1, 11, and 12 with a high temperature of 57°F. Above normal rain in Iowa slowed planting corn and soybean in May. Highest temperature was 103°F on May 27.

Summer. June was warm with seven days above 90°F; rain total of 5.9 in. provided excellent crop growing conditions. July records show an accumulation of one-inch-below average rainfall and cooler-than-normal temperatures. August rain total of 9.01 in. was 5 in. above normal.

Fall. September moisture doubled the normal rainfall and warmer temperatures extended the soybean and corn growing season. October harvest was delayed with rain. Most of the harvest was completed in November.

Acknowledgements

The farm would like to thank the Newell-Fonda Community School, ISU Extension, Farm Bureau, Buena Vista Public Health, Storm Lake Police Department, Buena Vista County Sheriff Department, Iowa Lakes Electric Coop, Iowa Corn Growers Association, NRCS, and PFI for their assistance with field days and events.

Table 1. Allee Demonstration Farm, Newell, monthly rainfall and degree days above 90°F for 2018.

<u>Month</u>	<u>Rain (in.)</u>	<u>Days >90°F</u>
April	1.46	0
May	3.87	8
June	5.90	7
July	2.82	3
August	9.01	1
September	5.21	4
October	<u>2.64</u>	<u>0</u>
Total	30.91	23

Research Projects at Newell**Research Project**

Automated weather station
 Beef cattle feeding
 Cooperator on-farm trials
 Cover crop grazing
 Heifer copper/estrogen study
 Cover crop grazing (soils)
 Farmer cover crop study
 Bioacoustic soundscape recordings
 Miscanthus

Project Leader

E. Taylor
 J. Reecy
 M. Witt
 D. Loy/E. Lundy/R. Vittetoe
 D. Loy/S. Hansen/E. Lundy
 M. Al-Kaisi
 P. Kassel
 A. Dixon
 E. Heaton