# Northwest Research Farm Summary

**RFR-A1908**

Northwest Iowa Experimental Association

**2019–2020**

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# Northwest Farm and Weather Summary

Terry Tuttle, farm superintendent

## Farm Comments

*Developments.* In August, a project was started to enhance an existing drainage tile system to allow it to more efficiently drain an area of the farm that had become unusable for small plot research due to excess water. The project included installing 16,685 ft of new perforated plastic drainage tile to replace old cement and clay tiles. The new tile discharges into a denitrifying bioreactor designed to reduce the amount of nitrogen leaving the farm in the tile water. Testing of water entering and exiting the bioreactor will determine the effectiveness of this edge-of-field practice. This project was generously supported by the Northwest Iowa Experimental Association, Heinsohn Digging and Tiling; J. Pettiecord, Inc.; and Prinsco, Inc.

There were no major new equipment purchases at the ISU Northwest Research Farm (NWRF) this year. A small cement mixer was purchased to aid in mixing Agrotain and urea for summer application in the Tile Study Plots and small concrete jobs around the farm. Construction of the gantry crane in the shop was finished.

A total of 42 research projects were conducted at the farm in 2019. Nine of these projects were new to the farm. The research farm planted and harvested over 4,100 individual plots. Also, 23 on-farm trials were conducted on cooperating farmer's fields in the area.

The ISU Home Demonstration Garden, 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 fourth year. Produce harvested from the garden went towards helping fight hunger in Northwest Iowa, with the produce being donated to ATLAS of Lyon County. Total produce donated was 667 lb with 327 lb as tomatoes. The theme in this year's kid's garden was "Storybook." New in the garden were the pollinator flowers and these were popular. Many people came to the garden to enjoy them and cut for their own homes. They were gorgeous and continued to bloom until the first frost. Along with produce donations from the demonstration garden, 340 lb of asparagus was harvested at the NWRF and donated to food pantries during the spring and early summer.

*Field days and tours.* There were 15 field days held by NWRF. A total of 1,970 visitors attended field days or other events at the farm in 2019. These events ranged from youth farm tours to private industry field days.

*New projects*. FMC soybean gall midge efficacy, E. Hodgson; ISU soybean gall midge efficacy, E. Hodgson; Thimet 20G soybean gall midge efficacy, R. Porter and NWRF staff; PV TWO.0 seed soil health, M. Licht; Improving cereal rye CC, M. Licht; REG field trial – glycerin, J. Sawyer, M. McDaniel, and S. Potter; Stoller corn program, A. Robertson and J. Shriver; ISA/ISU soybean date of planting, M. Witt and S. Nelson; ISU soybean breeder plots, A. Singh and B. Scott.

## Crop Season Comments

For the second year in a row, corn planting scheduled to begin in April was postponed by weather that was cooler and wetter than normal. The first corn planting occurred May 6 and was completed May 15. Corn harvest began October 15 and ended October 30.

Overall farm corn yield was 207 bushels/acre and continuous corn yielded 191 bushels/acre.

Soybean planting began May 7 and was completed June 7. Soybean harvest began October 8 and ended November 4. Overall farm soybean yield averaged 61 bushels/acre.

**Weather Comments**

*Spring 2019.* Once again, the soil moisture profile at the farm started off the season nearly full. This compounded with cool/wet conditions in April and May, and poor drying weather led to a delayed planting season. May brought persistent rainfall along with slightly warmer temperatures. During the month of May, the NWRF received measurable precipitation on 20 of the 31 days with two days being the longest stretch without precipitation. Soil conditions remained wet and marginal for planting. May temperatures remained relatively cool with the average temp 4°F below average for the month. The last two days of May and the first 10 days of June finally provided an extended period of no rainfall, and planting was completed June 7. Planting conditions were not optimum, excess moisture and cool temperatures led to slow emergence and growth for the earlier planted crops.

*Summer 2019.* In 2019, the NWRF received no major rainfall event (> 5.0 in.) in any month. June was modestly warm and dryer (80°F avg. daily high and 2.14 in. rain), with only four days reaching 90°F. July found temperatures and precipitation moderating. The average high temperature for the month was 82°F (only three days with a high of 90°F+) and total rainfall of 4.37 in. This combination provided an optimum environment for corn and beans to catch up in crop development. Soybean aphids were present in areas and reached threshold in later July and early August requiring an insecticidal treatment.

Disease pressure was low this year with no major problems noted. One new insect pest encountered at the NWRF in 2018 was present again at the farm in 2019. Soybean gall midge larvae again were infesting soybean plants. The majority of plots did not suffer from a significant, yield reducing population. The heaviest infestation resulted in a 72 percent reduction in yield. This pest will continue to be monitored and researched in an effort to learn more about the life cycle and culture of the insect and to formulate control and prevention measures. Diminished rainfall in the second half of August, along with moderate temperatures, and near normal rainfall and temps in September allowed for a little longer grain fill in corn and some new growth and pod fill in soybeans.

*Fall 2019.* The first killing frost was October 11. At that point, most of the soybean and corn were past physiological maturity. Once soybean harvest began October 8, the research farm received only seven days with measurable precipitation during the harvest season, which was unseasonably cool. November continued to bring intermittent precipitation and unseasonably cool temps making soil testing and fieldwork difficult. The staff was able to finish soil sampling and fertilization. A warming trend before Thanksgiving allowed fieldwork to be completed. Due to a higher than normal rainfall total for 2019 of 28.15 in. (+3.91 in.) for April through October, drainage in the tile water quality study continued to flow until it was shut down for the season December 6.

**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 research farm.

AMVAC
Wyffel's Seed
Corteva Crop Protection
Corteva-Pioneer Seed
Asgrow/DeKalb Seed
Bayer Crop Protection
Security State Bank
Farm Bureau, Sioux County
Farm Bureau, Lyon County
Ag Partners
5th Gen Ag
Farmers Coop Society
Heinsohn Digging and Tiling
CS Agrow
GSI
J. Pettiecord, Inc.
Prinsco, Inc.
Sickelka Ag

**Table 1. Northwest Research and Demonstration Farm, Sutherland, monthly rainfall and average temperatures for 2019.**

| | Rainfall (in.) | | Temperature (°F) | | Days |
|---|---|---|---|---|---|
| Month | 2019 | Deviation from normal* | 2019 | Deviation from normal | 90° or above |
| April | 4.19 | 1.50 | 46.2 | -0.4 | 0 |
| May | 6.40 | 2.41 | 54.8 | -4.0 | 0 |
| June | 2.14 | -2.47 | 69.1 | 0.1 | 4 |
| July | 4.37 | .90 | 72.5 | 0.6 | 3 |
| August | 1.86 | -2.10 | 68.1 | -1.3 | 0 |
| September | 4.43 | 1.08 | 66.8 | 4.6 | 0 |
| October | 4.76 | 2.60 | 43.6 | -5.4 | 0 |
| Totals | 28.15 | 3.91 | | | 7 |

*Rainfall averages recalculated based on data from 1957-2019.
**Temperature averages recalculated based on data from 1988-2019.

**Research Projects at Sutherland**

| Project | Project Leader |
|---|---|
| AMVAC insecticide trial | NWRF staff |
| AMVAC Thimet 20G SGM plot | NWRF staff |
| Aphid resistant soybean screening (HPR), Illinois | E. Hodgson/J. Hohenstein |
| Asparagus variety trial | NWRF staff |
| Cardinal corn fungicide efficacy x timing | A. Robertson |
| Corn row spacing x population trial | NWRF staff/M. Licht |
| Corn yield forecasting trial | M. Licht/S. Archontoulis |
| Corteva-Pioneer seed corn variety trial | NWRF staff/B. Swart |
| DeKalb corn-CC trial | NWRF staff/C. Lamoureux |
| Demonstration windbreak | B. Beck |
| Field edge de-nitrification bioreactor | NWRF staff/M. Helmers |
| FMC soybean gall midge plots | E. Hodgson |
| Herbicide comparison demonstration | P. Kassel/NWRF staff |
| Home demonstration garden, Rock Rapids | C. Haynes/D. Henderson |
| Improving cereal rye cover crop | M. Licht |
| Iowa Crop soybean variety test | J. Rouse |
| ISA – soybean planting date comparison | M. Witt/S. Nelson |
| ISU soybean gall midge plots | E. Hodgson |
| Long-term nitrogen rate study | S. Archontoulis |
| 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 – True armyworm (TAW) | A. Dean |
| PV TWO.0 seed soil health | M. Licht |
| REG field trial – glycerin | J. Sawyer/M. McDaniel/S. Potter |
| Soybean aphid efficacy trial | E. Hodgson |
| Soybean aphid resistance trial – Pioneer | E. Hodgson/J. Hohenstein |
| Soybean aphid suction trap | E. Hodgson |
| Soybean breeder trial plots | A. Singh/B. Scott |
| Soybean fungicide timing trial | D. Mueller/S. Wiggs |
| Soybean gall midge emergence trap | M. Helton |
| Soybean row spacing x population trial | NWRF Staff/M. Licht |
| Soybean yield forecasting trial | M. Licht/S. Archontoulis |
| Statewide soybean fungicide comparison | D. Mueller/ S. Wiggs |
| Stoller field trial | A. Robertson/J. Shriver |
| Surface runoff study | A. Mallarino/M. Helmers |
| Tile water quality study | M. Helmers/J. Sawyer |
| Tillage x fertilizer placement (P&K) study | A. Mallarino |
| Water table monitoring | NRCS |
| Weather stations (Sutherland, Doon, Ocheyeden) | NWRF staff |
| Weed science herbicide demonstration | D. Franzenburg |
| Wyffels corn variety trial | NWRF staff/J. Friedrichsen |

# Allee Demonstration Farm Summary

Lyle Rossiter, farm superintendent

## Farm Comments

*Developments*. The soil over the Dakota Access Pipe Line held water and was too wet to farm. Three 6-in. tile lines, totaling 900 ft, were trenched alongside the pipeline in August. Cover crops were planted after the tile system was complete to minimize wind erosion and add living roots to activate soil biology.

Nitrogen management is a high priority on the ISU Allee Demonstration 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. Sidedressing liquid nitrogen on corn in June has decreased total nitrogen on corn by 50 percent without reducing yield.

The implementation of cooperator on-farm trials continues in Buena Vista, Sac, Pocahontas, Carroll, Calhoun, Ida, Cherokee, and Clay counties. 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.

*Events.* A Master Gardener apple pruning training was held March 11. There were 17 Master Gardeners in attendance.

On June 7, the Buena Vista County and Pocahontas County special swine class was held with 32 4-H youth participating in an educational day, as well as becoming familiar with and showing live market pigs before their local fairs.

ISU Extension specialists Mike Witt and Paul Kassel worked with the Allee Farm June 10 planting cereal rye, oats, annual rye, radish, cowpeas, hairy vetch, alfalfa, garden peas, fall rye, red clover, crimson clover, balansa clover, and red winter wheat in the corn field plot when the corn reached the V4 stage.

Observance of emergence, light vs. shading, moisture tolerance, and growth data was taken throughout the summer. Twenty-four guests attended the field tour August 27. The field trial data observed red clover, field peas, and annual rye grass survived and grew the most biomass of the 13 cover crops planted.

The Allee Farm hosted Ag-Citing Days on September 17 and 18. Topics covered included soil science, amazing corn, Monarch butterflies, corn ethanol, and buzzing with bees. Additionally, 4-H youth presented talks on their live beef cattle, goat, rabbit, and swine projects to 400 fourth-grade students from across Buena Vista County.

On September 19, the farm hosted the Buena Vista County Ag Safety Day for 180 third-grade students. Topics included chemical liquids, ambulance tour, first aid, sheriff car tour, home alone, sun exposure, electrical, lawn equipment (mower), and farm equipment safety.

On October 7, the farm hosted an FFA miscanthus field day. Nine FFA students from Newell-Fonda High School attended.

A grazing CRP pasture walk was held with ISU beef specialist, Erika Lundy; ISU wildlife specialist, Adam Janke; and Crawford County NRCS representative, Pat Corey. The pasture walk topics included grazing CRP programs, grass and forb species identification, fencing demonstration, grazing, wildlife habitat

management, and cover crop food plots. Providing talking points throughout the tour was given by all the specialists listed above. Lyle Rossiter and Clint Von Glan discussed daily pasture grazing management practices. There were 39 people in attendance.

The Allee Farm appreciates the community support and the opportunity to be an educational site for all ages and families. A total of 778 guests visited the farm, and the Allee Historical Mansion hosted 1,156 visitors in 2019.

*Projects*. The fifth 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 fourth year of the spring grazing cover crop study continued. Aerial seeding in August of oats and cereal rye on the grazing study was started in 2018. Oats provided fast fall growth rates in corn, but slower rates in soybeans. Cereal rye in the spring provided the most biomass for grazing because of the increase in GDDs in late April to May 10, when the cattle stopped grazing.

A new fall grazing cover crop started in August with an airplane broadcasting oats over the 32-acre rye cover crop. The oats and rye grew in standing soybeans. Growth was not enough to graze this fall.

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 80 head of cattle and grazed 37 heifers on cereal rye cover crops in the spring. The farm custom-fed 177 head of cattle and collected research data for the purebred Angus cowherd at the ISU McNay Research Farm, Chariton, Iowa.

The automated weather station was installed in the northwest corner of the farm in fall 2014. The 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 4. Harvest was completed November 4, with average yields of 223 bushels/acre.

Soybean planting was finished June 10. Harvest was completed October 23 with average yields of 46 bushels/acre.

## Weather Comments

*Winter*. January's highest temperature was 57°F and a low of -24°F. February's highest temperature was February 3 at 51°F; lowest temperature was -14°F and a blizzard on February 24 and 25. The first week of March was cold with above average temperatures the last 12 days and a high of 69°F March 27.

*Spring*. April was warm with 15 days above normal. The highest temperature was 84°F April 21. Rain total was 2.95 in. and a dry period from April 10 through April 23 allowed for the early planting of corn. May rains were frequent, totaling 7.17 in. Cool temperatures slowed soil drying and the planting of corn and soybean.

*Summer.* The first week of June was dry and higher-than-normal temperatures allowed farmers to finish planting corn and soybean. Fourteen days above normal temperatures increased growing degree days for crop growth. July was warm with 18 days above normal, but only two days above 90°F. Rainfall totals for July and August were below normal. August temperatures were warmer with a high of 87°F and a low of 49°F.

*Fall*. September rain (5.69 in.) and warmer temperatures helped late-planted crops develop. Harvest started in October, while rain persisted, totaling 4.86 in. (2.49 in. above normal). November started off with below-normal temperatures. Warmer-than-average temperatures the last two weeks allowed corn moistures to dry.

**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 Cooperative, Iowa Corn Growers Association, NRCS, and the Practical Farmers of Iowa for their assistance with field days and events.

**Table 1. Allee Demonstration Farm, Newell, monthly rainfall and degree days above 90ºF for 2019.**

| Month | Rain (in.) | Days >90ºF |
|---|---|---|
| April | 2.96 | 0 |
| May | 7.17 | 0 |
| June | 4.22 | 3 |
| July | 3.02 | 2 |
| August | 3.39 | 0 |
| September | 5.69 | 0 |
| October | 4.86 | 0 |
| Total | 31.31 | 5 |

**Research Projects at Newell**

| Research Project | Project Leader |
|---|---|
| Automated weather station | L. Rossiter |
| Beef cattle feeding | L. Rossiter |
| Cooperator on-farm trials | M. Witt |
| Cover crop grazing | D. Loy/E. Lundy/R. Vittetoe |
| Cover crop grazing (soils) | M. Al-Kaisi |
| Farmer cover crop study | P. Kassel |
| Bioacoustic Soundscape recordings | A. Dixon |
| Miscanthus | E. Heaton |