2017

Northeast Research Farm Summary

Northeast Iowa Agricultural Experiment Station

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Northeast Research Farm Summary

RFR-A1688

Northeast Iowa Agricultural Experimental Association
2016–2017

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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 675 people attended 10 field days/farm tours at the ISU Northeast Research Farm (NERF) in 2016. More than 3,000 people visited the Borlaug Learning Center (BLC). The BLC hosted nearly 60 events ranging from legislative tours of water quality research to agronomy, horticulture, and livestock/crops extension trainings. The summer field day included information on our water quality research, cover crops, soil health, and ag law issues. The fall field day was a 40th anniversary celebration of the research farm and the Northeast Iowa Agricultural Experimental Association (NEIAEA), which owns the farm. Tours of field research, horticulture, windbreak, and historical corn inbred/hybrid demonstrations were conducted after a grain market outlook meeting and meal by the Chickasaw County Pork Producers. A soil drainage management workshop also was held with a tile drainage installation demonstration on four acres of land.

New projects. Gypsum rates on corn and soybean, A. Mallarino; Dicamba resistant soybean herbicide evaluation, NERF; Pollinator species/Monarch butterfly study, R. Hellmich; and two evaluations of in-furrow planter applied products, T. Basol/NERF.

Crop Season Comments
On March 22 and April 4, early manure injection treatments and oat variety plots were seeded, respectively. Anhydrous ammonia-N was applied and urea N rates were hand spread the week of April 10. Corn and soybean research plot planting began April 16. Corn planting was completed May 12 and soybeans May 19 due to below normal April and May rainfall.

Corn harvest began October 3 and was completed October 25. Corn yields were above average, but not a record, due to excessive rainfall starting mid-June. Corn yields on rotated acres ranged from 185 to 235 bushels/acre and averaged 210 bushels/acre. Continuous corn yields ranged from 180 to 230 bushels/acre and averaged 205 bushels/acre. Soybean yields were slightly above average, except some field areas with sudden death syndrome (SDS) disease that varied mainly by variety. Soybean aphids did not reach the economic thresholds for control with only 179/plant recorded August 25, before populations dropped rapidly. Yields ranged from 55 to 85 bushels/acre and averaged 65 bushels/acre.

Weather Comments
Winter 2015–2016. The first measurable snowfall occurred November 20, 2015, and the last snow for the season was April 8, 2016, with a total of 47.8 in. recorded. The average 4-in. soil temperature remained below 50°F after November 6, 2015. Above normal November and December precipitation and non-frozen top soils kept drainage tiles running throughout the winter and early spring.

Spring 2016. The 4-in. average soil temperature remained above 50°F on April 15. In April, 14 days were suitable for field work and 13 days had precipitation. The last killing frost was May 15 for sensitive vegetation such as garden transplants. Most crops were just starting to emerge, with minimal damage to corn seedlings. In May, 19 days were suitable for field work and 14 days had precipitation, however, all rains were light and did not cause any major planting delays.

Summer 2016. In July, rainfall was 6.22 in. above the 30-yr average providing ample
moisture during corn pollination and soybean seed fill. In September, rainfall was 12.27 in. above the 30-yr average causing flooding and soil erosion. Summer temperatures were above normal.

Corn pollination occurred primarily the week of July 16. Foliar crop diseases were minimal with corn diseases arriving late in the season and SDS in soybeans starting in early August for susceptible varieties. Summer heat units were slightly above normal, which allowed corn to mature prior to frost, with minimal corn drying required. Only nine days in the growing season had air temperatures at or above 90°F.

**Fall 2016.** The first killing freeze occurred October 13 (27°F), allowing all crops to mature. A total of 2,854 heat units were recorded from May through September of 2016, about 100 more than the previous year.

From April through November, 48.92 in. of rain was recorded, which was 19.22 in. above the 30-yr average.

The majority of grain harvest occurred after the September 21-23 flooding event (9.47 in.), with only 1.13 in. of rainfall in the 30 days during harvest. Grain moisture during corn harvest started at 20.3 percent October 3 and was 15.5 percent October 25. Relative humidity was high in early October, delaying soybean harvest due to soybean moistures in the 15–17 percent range. The 4-in. soil temperature remained below 50°F after November 18, 2016.

**Acknowledgements**

We thank the 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 2016 growing season.**

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (in.)</th>
<th>Departure from normal NERF</th>
<th>No. days of rain</th>
<th>Departure from normal NERF</th>
<th>Temperature (°F)*</th>
<th>Growing degree days</th>
<th>Days 90°F+</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>2.34</td>
<td>-1.54</td>
<td>9</td>
<td>49.9</td>
<td>+2.2</td>
<td>194</td>
<td>0</td>
</tr>
<tr>
<td>May</td>
<td>3.04</td>
<td>-1.40</td>
<td>12</td>
<td>60.3</td>
<td>+0.9</td>
<td>396</td>
<td>1</td>
</tr>
<tr>
<td>June</td>
<td>11.62</td>
<td>+6.22</td>
<td>12</td>
<td>71.5</td>
<td>+2.4</td>
<td>631</td>
<td>3</td>
</tr>
<tr>
<td>July</td>
<td>6.05</td>
<td>+1.30</td>
<td>9</td>
<td>72.3</td>
<td>+0.3</td>
<td>685</td>
<td>3</td>
</tr>
<tr>
<td>August</td>
<td>7.32</td>
<td>+2.95</td>
<td>9</td>
<td>71.3</td>
<td>+1.7</td>
<td>655</td>
<td>1</td>
</tr>
<tr>
<td>September</td>
<td>14.91</td>
<td>+12.27</td>
<td>9</td>
<td>65.9</td>
<td>+3.7</td>
<td>487</td>
<td>1</td>
</tr>
<tr>
<td>October</td>
<td>2.32</td>
<td>-0.15</td>
<td>8</td>
<td>54.8</td>
<td>+5.5</td>
<td>269</td>
<td>0</td>
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<tr>
<td>November</td>
<td>1.32</td>
<td>-0.43</td>
<td>5</td>
<td>44.1</td>
<td>+9.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>48.92</td>
<td>+19.22</td>
<td>73</td>
<td></td>
<td></td>
<td>1st hard freeze: 27°F (10/13/16)</td>
<td>9</td>
</tr>
</tbody>
</table>

*150 frost-free days
# Research Farm Projects

<table>
<thead>
<tr>
<th>Research Project/Demonstration</th>
<th>Project Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automated weather station (ISU Mesonet)</td>
<td>E. Taylor</td>
</tr>
<tr>
<td>Alfalfa nutrient and management studies</td>
<td>B. Lang</td>
</tr>
<tr>
<td>Asparagus variety trial</td>
<td>P. O’Malley</td>
</tr>
<tr>
<td>Bt trait/corn variety x fungicide study</td>
<td>ISU NERF</td>
</tr>
<tr>
<td>Corn planting date x relative maturity study</td>
<td>M. Licht</td>
</tr>
<tr>
<td>Cover crop x N fertilizer timing x tillage study</td>
<td>J. Sawyer</td>
</tr>
<tr>
<td>Cover crop mixture studies in corn and soybeans</td>
<td>E. Juchems</td>
</tr>
<tr>
<td>Crop N rate x crop rotation studies</td>
<td>J. Sawyer/A. Mallarino</td>
</tr>
<tr>
<td>Crop rotation x corn variety x tillage x planting population study</td>
<td>ISU NERF</td>
</tr>
<tr>
<td>Evaluation of corn rootworm insecticides and genetic seed traits</td>
<td>A. Gassmann</td>
</tr>
<tr>
<td>Evaluation of energy usage with field implements and corn dryers</td>
<td>M. Hanna</td>
</tr>
<tr>
<td>Evaluation of foliar fungicides, application timings, and seed treatments on corn and soybeans</td>
<td>A. Robertson/D. Mueller/</td>
</tr>
<tr>
<td>Evaluation of gypsum rates on corn and soybean yields</td>
<td>A. Mallarino</td>
</tr>
<tr>
<td>Evaluation of in-furrow, vegetative, and reproductive stage fungicide</td>
<td>ISU NERF/D. Mueller</td>
</tr>
<tr>
<td>Evaluation of prairie seed mixes and mowing on prairie strip establishment</td>
<td>T. Basol</td>
</tr>
<tr>
<td>Evaluation of soybean aphid flight populations from a suction trap monitor</td>
<td>L. Jackson/J. Meissen</td>
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<tr>
<td>Evaluation of soybean aphid foliar and seed treatment insecticides</td>
<td>D. Voegtlin/</td>
</tr>
<tr>
<td>Evaluation of water tables, tiling methods, and tile spacing distances</td>
<td>D. Lagos-Kutz</td>
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<tr>
<td>Evaluation of weed management strategies in corn and soybeans</td>
<td>E. Hodgson</td>
</tr>
<tr>
<td>Home demonstration garden</td>
<td>ISU NERF</td>
</tr>
<tr>
<td>Hydrogeology water quality studies in the Devonian Aquifer</td>
<td>M. Owen</td>
</tr>
<tr>
<td>Iowa Crop Improvement Association corn and soybean variety trials</td>
<td>C. Haynes</td>
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<tr>
<td>K rate x residual soil K studies on corn and soybeans</td>
<td>B. Simpkins</td>
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<tr>
<td>Long-term P-K rate study</td>
<td>A. Mallarino</td>
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<tr>
<td>Long-term tillage x crop rotation studies</td>
<td>A. Mallarino</td>
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<tr>
<td>Milkweed and pollinator species x Monarch butterfly evaluation</td>
<td>M. Al-Kaisi/M. Hanna</td>
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<tr>
<td>Nitrogen rates following fall injected swine manure</td>
<td>R. Hellmich</td>
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<tr>
<td>Oat variety studies (Nashua and Kanawha)</td>
<td>ISU NERF</td>
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<tr>
<td>Pawpaw tree winter hardiness demonstration</td>
<td>PFI</td>
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<tr>
<td>Phosphorus and potassium placement and rate in different tillages</td>
<td>P. O’Malley</td>
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<tr>
<td>Phosphorus rate x P source study</td>
<td>A. Mallarino</td>
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<tr>
<td>Rate of lime study</td>
<td>A. Mallarino</td>
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<tr>
<td>Soybean planting date x relative maturity study</td>
<td>ISU NERF</td>
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<tr>
<td>Soybean seed treatment x disease control studies</td>
<td>M. Licht</td>
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<tr>
<td>Water quality study (cover crops, crop rotation, fertilizer source/application timing)</td>
<td>A. Robertson/D. Mueller</td>
</tr>
<tr>
<td>Water quality tracing of antibiotics in soils with manure applications</td>
<td>M. Helmers/A. Mallarino</td>
</tr>
<tr>
<td>Water quality with use of bioreactor</td>
<td>M. Soupir/T. Moorman</td>
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</table>
Acknowledgements
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Case IH Corporation
CDS-John Blue Company
Dekalb Genetics
Dennis Weibke
ISU Weed Science Team
Johnson Drainage Plows
Kruger Seed Company
MBS Farms / Farmers Feed & Grain

Midwest Plastic Products Inc.
Mike Shaw
Monsanto Company
Mitas North America, Inc.
PCS Fertilizer
Pioneer Hi-Bred International
Raven Industries
Smidt Crop Management, Inc.
Sukup Manufacturing
Swartzrock Implement
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Syngenta NK Brand Seeds
USDA National Lab for Ag & Environment
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Northeast Research and Demonstration Farm
3321 290th Street
Nashua, IA 50658

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Experiments in Previous Annual Reports

Demonstrating Cover Crop Mixtures on Iowa Farmland: Management, Soil Health, and water quality benefits RFR-A1590 ................................................ ISRF15-13
Best Management Production Input Approach to High Yield Alfalfa RFR-A1583 .... ISRF15-13
Enhancing Corn Yield in a Winter Cereal Rye Cover Cropping System RFR-A1545 ISRF15-13
Corn and Soybean Yield Responses to Micronutrients in NE Iowa RFR-A14106 ISRF14-13
In-season N Fertilization Strategies using Active Sensors RFR-A1467 ISRF14-13
Midwest Suction Trap Network RFR-A1492 ISRF14-13
Crop and Soil Responses to Rates of Lime RFR-A14101 ISRF14-13
Long-term Phosphorus and Potassium Fertilization Effects on Yields of Corn and Soybean Grown in Rotation RFR-A14104 ISRF14-13
Evaluation of Soybean Aphid-resistant Soybean Lines RFR-A13111 ISRF13-13
Corn and Soybean Potassium Uptake, Removal with Harvest and Recycling to the Soil RFR-A12109 ISRF12-13
Effects of Seed Treatments and a Soil-applied Nematicide on Corn Yields and Nematode Population Densities RFR-A12114 ISRF12-13
Regional Corn Re-plant Recommendations RFR-A11120 ISRF11-13
Soybean Planting Dates in Northeast Iowa RFR-A11127 ISRF11-13
Fertilizer and Swine Manure Management Systems Impact Phosphorus in Soil and Subsurface Tile Drainage RFR-A11115 ISRF11-13
Corn Population Research RFR-A10112 ISRF10-13
Phosphorus and Potassium Placement Methods and Tillage Effects on Yield of Corn and Soybean RFR-A10110 ISRF10-13
Role of Directly Connected Macropores on Pathogen Transport to Subsurface Drainage Water RFR-A9116 ISRF09-13
Corn Breeding ISRF08-13
Organic vs. Conventional Farming Systems ISRF08-13
Development of Methodologies to Reduce the DCAD of Hay for Transition Dairy Cows ISRF07-13
Sulfur Deficiency in Northeast Iowa Alfalfa Production ISRF06-13
Effect of Four Tillage Systems and Two Crop Rotations on Placement of P and K ISRF05-13
Evaluation of Hybrid Vigor between Different Alfalfa Varieties ISRF05-13
NO3-N Concentrations in Shallow and Deep Groundwater Wells from 1991–2003 ISRF04-13
Runoff Phosphorus Loss as Affected by Tillage, Fertilizer, and Swine Manure Phosphorus Management in Corn-Soybean Production Systems ISRF04-13
Legume Identity and Timing of Incorporation Effect on Soil Responses to Green Manure ISRF03-13
Corn Row Spacing, Plant Density, and Maturity Effects ISRF02-13
Excerpts from Keynote Address: ISU NE Research Farm Silver Anniversary Field Day ISRF01-13
Emergence Characteristics of Several Annual Weeds ISRF00-13
Stalk and Ear Diseases in Bt and Non-Bt Corn Hybrids in Northeast Iowa ISRF00-13
Stand Reduction Effects on Corn Grown at High Population Densities ISRF99-13
Transport of Chemicals through Fractures in Pre-Illinoian Till ISRF99-13
Conversion of CRP to Corn and Soybeans ISRF96-13
Hydrogeology and Water Quality Studies in the Devonian Aquifer ISRF94-13