Northeast Research Farm Summary

Northeast Iowa Agricultural Experimental Association

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Northeast Iowa Agricultural Experimental Association
2017–2018

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103 Curtiss Hall, 513 Farm House Lane, ISU
Corn harvest began October 9 and was completed November 2. Corn yields were above average, and possibly a record, due to adequate rainfall and below normal August temperatures, which provided a slow grain fill period, increasing test weights and yields. Corn yields on rotated acres ranged from 220 to 260 bushels/acre and averaged 230 bushels/acre. Continuous corn yields ranged from 220 to 250 bushels/acre and averaged 225 bushels/acre. Soybean yields were average to above average, except for some late May planted plots, that could have used more rainfall in late August. Minimal sudden death syndrome (SDS) and white mold disease occurred. Soybean aphids did not reach the economic thresholds for control with only 67 and 132/plant recorded September 1 and 14, respectively. Yields ranged from 55 to 75 bushels/acre and averaged 65 bushels/acre.

Weather Comments
Winter 2016–2017. The first measurable snowfall occurred December 3, 2016, and the last snow for the season was March 12, 2017, with a total of 36.4 in. recorded, 11.4 in. less than the previous winter. The average 4-in. soil temperature remained below 50°F after November 9, 2016. Below normal November and December precipitation and frozen top soils kept drainage tiles dry throughout the winter and early spring.

Spring 2017. The 4-in. average soil temperature remained above 50°F on May 3. In April, 15 days were suitable for field work and 13 days had precipitation. The last killing frost was April 28 for sensitive vegetation. In May, 18 days were suitable for field work and 15 days had precipitation. A May 15 hailstorm with 1.26 in. precipitation caused some soil crusting issues and some soybean re-planting. Late May planted soybeans had delayed

Farm and Weather Summary

Ken Pecinovsky, farm superintendent

Farm Comments
Field days and tours. More than 600 people attended 11 field days/farm tours at the ISU Northeast Research Farm (NERF) in 2017. More than 3,000 people visited the Borlaug Learning Center (BLC) and NERF. The BLC hosted nearly 60 events ranging from meetings on water quality research to agronomy, horticulture, and livestock/crops extension trainings. The summer field day included information on current issues related to weed and nitrogen management. Cover crops, weather, and yield predictions also were discussed. The fall field day included topics such as grain drying recommendations, crop disease and fungicide use, dicamba weed control issues and crop price projections.

Tours of field research were held including the home demonstration garden, water quality research plots, and herbicide, fungicide, and nitrogen rate evaluation studies. A soil drainage management workshop was held with a tile drainage installation demonstration on four acres of land.

New projects. Crop growth modeling, S. Archontoulis; Dicamba resistant soybean herbicide evaluation, M. Owen; and Evaluations of in-furrow products with corn planting dates, ISU NERF.

Crop Season Comments
On April 7 and 10, oat variety plots were seeded and early manure injection treatments were applied in water quality plots, 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 11 and April 27, respectively. Corn planting was completed May 13 and soybeans May 30.
emergence issues from 20 days of minimal precipitation.

Summer 2017. July rainfall was 3.57 in. above the 30-yr average, providing ample moisture during corn pollination, despite drought conditions in northwest and south central Iowa. August rainfall was 2.76 in. below the 30-yr average, but air temperatures were 2.8°F below the 30-yr average, which increased corn and soybean yields due to no heat stress during grain fill. September and October air temperatures were 4°F above normal, which helped reduce the amount of artificial drying of corn at harvest.

Corn pollination occurred primarily the week of July 16. Foliar crop diseases were minimal in corn and soybeans. Summer heat units were slightly above normal, which allowed corn to mature prior to frost. Fifteen days in the growing season had air temperatures at or above 90°F with none in August during corn grain fill, resulting in increased corn yields.

Fall 2017. The first killing freeze occurred October 29 (22°F), three weeks later than normal. A total of 2,669 heat units were recorded from May through September of 2017, about 185 less than the previous year. From April through November, 31.83 in. of rain was recorded, which was 1.56 in. above the 30-yr average.

Grain moisture during corn harvest started at 21.7 percent October 9 and was 18.0 percent November 1. Four days of above 90°F temperatures September 21–24 reduced soybean grain moisture levels from 20 percent to 9 percent in two days. The 4-in. soil temperature remained below 50°F after October 24, 2017, with later planted cover crops not able to germinate.

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 2017 growing season.

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (in.)</th>
<th>Departure from normal</th>
<th>No. days of rain</th>
<th>Departure from normal</th>
<th>Growing degree days</th>
<th>Days 90°F+</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>4.31</td>
<td>+0.52</td>
<td>11</td>
<td>50.8</td>
<td>+3.2</td>
<td>176</td>
</tr>
<tr>
<td>May</td>
<td>4.79</td>
<td>+0.39</td>
<td>12</td>
<td>58.4</td>
<td>-1.1</td>
<td>331</td>
</tr>
<tr>
<td>June</td>
<td>5.15</td>
<td>-0.48</td>
<td>13</td>
<td>70.9</td>
<td>+1.8</td>
<td>606</td>
</tr>
<tr>
<td>July</td>
<td>8.35</td>
<td>+3.57</td>
<td>7</td>
<td>72.8</td>
<td>+0.9</td>
<td>698</td>
</tr>
<tr>
<td>August</td>
<td>1.75</td>
<td>-2.76</td>
<td>8</td>
<td>67.0</td>
<td>-2.8</td>
<td>531</td>
</tr>
<tr>
<td>September</td>
<td>2.25</td>
<td>-0.75</td>
<td>6</td>
<td>66.4</td>
<td>+4.1</td>
<td>503</td>
</tr>
<tr>
<td>October</td>
<td>4.86</td>
<td>+2.46</td>
<td>10</td>
<td>53.4</td>
<td>+3.9</td>
<td>250</td>
</tr>
<tr>
<td>November</td>
<td>0.37</td>
<td>-1.39</td>
<td>6</td>
<td>44.4</td>
<td>+8.8</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>31.83</td>
<td>+1.56</td>
<td>73</td>
<td>1st hard freeze: 22°F (10/29/17)</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

*183 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 ISU NERF</td>
</tr>
<tr>
<td>Bt trait/corn variety x fungicide study</td>
<td>M. Hanna</td>
</tr>
<tr>
<td>Corn drying energy usage study</td>
<td>M. Licht</td>
</tr>
<tr>
<td>Corn planting date x relative maturity study</td>
<td>J. Sawyer ISU NERF</td>
</tr>
<tr>
<td>Corn nitrogen rates and tillage in a corn-soybean crop rotation</td>
<td>ISU NERF</td>
</tr>
<tr>
<td>Corn head comparison of knife rolls vs. OEM stalk rolls</td>
<td>E. Juchems</td>
</tr>
<tr>
<td>Cover crop mixture studies in corn and soybeans</td>
<td>J. Sawyer/A. Mallarino ISU NERF</td>
</tr>
<tr>
<td>Crop N rate x crop rotation studies</td>
<td>S. Archontoulis</td>
</tr>
<tr>
<td>Crop rotation x corn variety x tillage x planting population study</td>
<td>M. Castellano</td>
</tr>
<tr>
<td>Crop growth modeling</td>
<td>A. Gassmann ISU NERF</td>
</tr>
<tr>
<td>Corn and soybean planting date x nitrogen rate on corn study</td>
<td>A. Robertson/D. Mueller/ISU NERF/AX Yang/S. Navi</td>
</tr>
<tr>
<td>Evaluation of corn rootworm insecticides and genetic seed traits</td>
<td>L. Jackson/ J. Meissen ISU NERF</td>
</tr>
<tr>
<td>Evaluation of foliar fungicides, application timings, and seed</td>
<td>D. Lagos-Kutz</td>
</tr>
<tr>
<td>treatments on corn and soybean diseases</td>
<td>D. Hodgson</td>
</tr>
<tr>
<td>Evaluation of gypsum rates on corn and soybean yields</td>
<td>M. Owen</td>
</tr>
<tr>
<td>Evaluation of fungicide application timings &amp; placement</td>
<td>A. Mallarino</td>
</tr>
<tr>
<td>Evaluation of in-furrow products and corn planting dates</td>
<td>C. Haynes</td>
</tr>
<tr>
<td>Evaluation of seed mixes/mowing on prairie establishment</td>
<td>B. Simpkins</td>
</tr>
<tr>
<td>Evaluation of soybean aphid flight population monitoring</td>
<td>J. Rouse</td>
</tr>
<tr>
<td>Evaluation of soybean aphid foliar and seed treatment insecticides</td>
<td>A. Mallarino</td>
</tr>
<tr>
<td>Evaluation of water tables, tiling methods, and tile spacing distances</td>
<td>M. Al-Kaisi/M. Hanna ISU NERF</td>
</tr>
<tr>
<td>Evaluation of weed management strategies in corn and soybeans</td>
<td>A. Mallarino</td>
</tr>
<tr>
<td>Gypsum rate study in corn and soybeans</td>
<td>A. Mallarino</td>
</tr>
<tr>
<td>Hydrogeology water quality studies in the Devonian Aquifer</td>
<td>C. Haynes</td>
</tr>
<tr>
<td>Iowa Crop Improvement Association corn and soybean variety trials</td>
<td>P. O’Malley ISU NERF</td>
</tr>
<tr>
<td>K rate x residual soil K studies on corn and soybeans</td>
<td>M. Licht ISU NERF</td>
</tr>
<tr>
<td>Long-term P-K rate study</td>
<td>ISU NERF</td>
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<tr>
<td>Long-term tillage x crop rotation studies</td>
<td>A. Mallarino</td>
</tr>
<tr>
<td>Milkweed and pollinator species x Monarch butterfly evaluation</td>
<td>P. O’Malley ISU NERF</td>
</tr>
<tr>
<td>Nitrogen rates following fall injected swine manure</td>
<td>A. Mallarino</td>
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<tr>
<td>Oat variety studies</td>
<td>ISU NERF</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>M. Al-Kaisi/M. Hanna ISU NERF</td>
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<tr>
<td>Soybean seed treatment x disease control studies</td>
<td>A. Mallarino</td>
</tr>
<tr>
<td>Water quality study (cover crops, crop rotation, fertilizer</td>
<td>M. Helmers/ A. Mallarino ISU NERF</td>
</tr>
<tr>
<td>source/application timing</td>
<td></td>
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<tr>
<td>Water quality tracing of antibiotics in soils with manure applications</td>
<td>M. Soupir/T. Moorman</td>
</tr>
<tr>
<td>Water quality with use of bioreactor</td>
<td>M. Helmers</td>
</tr>
</tbody>
</table>
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
Asgrow Seed Company
BASF Corporation
Beck’s Hybrids
Brian Lang ISU Extension
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Calmer Corn Heads
Case IH Corporation
CDS-John Blue Company
Cropwise Consulting
Dairyland Seed Company
Dekalb Genetics
Dennis Weibke
Gandy Company
Glen Zubrod
ISU Weed Science Program
Johnson Drainage Plows
John Fox
Kruger Seed Company

Kuhn North America, Inc.
MBS Farms / Farmers Feed & Grain
Mike Shaw
Monsanto Company
Mitas North America, Inc.
Potash Corp
Pioneer Hi-Bred International
Raven Industries
Renk Seed Company
Smidt Crop Management, Inc.
Sukup Manufacturing
Swartzrock Implement
Syngenta Crop Protection
Syngenta NK Brand Seeds
Timewell Drainage Products
USDA National Lab for Ag & Environment
Winfield Solutions, LLC
Yetter Manufacturing Company

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

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

Phosphorus and Potassium Placement for Corn and Soybeans
  Managed with Tillage or No Tillage RFR-A1682 .......................................... ISRF16-13
Field Test for Effects of Cross-Resistance on Root Injury to Bt Corn
  By Western Corn Rootworm RFR-A1694 .................................................. ISRF16-13
Denitrification Bioreactor in Northeast Iowa RFR-A1696 .................................. ISRF16-13
Corn Yield Response to Nitrogen Fertilizer Application Timing RFR-A1691 ........ ISRF16-13
Enhancing Corn Yield in a Winter Cereal Rye Cover Crop System RFR-A1683 ....... ISRF16-13
Demonstrating Cover Crop Mixtures on Iowa Farmland: Management, Soil Health,
  and water quality benefits RFR-A1590 .................................................. ISRF15-13
Corn and Soybean Yield Responses to Micronutrients in NE Iowa RFR-A14106 ...... 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
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Role of Directly Connected Macropores on Pathogen Transport
  to Subsurface Drainage Water RFR-A9116 ............................................. ISRF09-13
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Development of Methodologies to Reduce the DCAD
  of Hay for Transition Dairy Cows ......................................................... ISRF07-13
Sulfur Deficiency in Northeast Iowa Alfalfa Production ................................ ISRF06-13
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
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