2016

Northeast Research Farm Summary

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Northeast Research Farm Summary

RFR-A15102

Northeast Iowa Agricultural Experimental Association
2015–2016

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Farm and Weather Summary

Ken Pecinovsky, farm superintendent

Farm Comments
Field days and tours. More than 800 people attended 10 field days/farm tours at the ISU Northeast Research Farm (NERF) in 2015. More than 5,000 people visited the Borlaug Learning Center (BLC). The BLC hosted nearly 150 events ranging from farmland leasing/insurance meetings to agronomy, horticulture, and livestock/crops extension trainings. The summer field day included information on our water quality research, nitrogen management, advantages of diverse crop rotations, and meteorological weather predictions. The fall field day included information on corn rootworm research, long-term tillage comparisons, a crop development update, and yield/grain marketing predictions based on current supply and demand. A soil drainage management workshop was held with a tile drainage installation demonstration on three acres of land.

New projects. Corn rootworm trait/tent studies, A. Gassman; Hybrid/inbred corn variety testing grown in no nitrogen/normal nitrogen rate environments, T. Lubberstedt; Milkweed species/monarch butterfly study, R. Hellmich; Prairie mix establishment study, L. Jackson (UNI); and many evaluations of in-furrow planter-applied products and seed treatments, various researchers.

Crop Season Comments
On March 22 and April 1, oat and alfalfa plots were planted. Nitrogen applications began April 1. On April 7, nitrogen rates were weighed and hand spread on N rate studies. Corn and soybean research plot planting began April 18. Corn planting was completed May 9 and soybeans May 18 due to below-normal May rainfall.

Corn harvest began October 8 and was completed October 21, the fastest on record, due to no rainfall from September 29 until October 23. Corn yields were above the long-term average, mostly as a result of frequent, moderate rains throughout the growing season, and a cooler July and August during the grain-fill stage. Despite a summer with minimal heat stress, the October 17 frost date allowed late-planted corn to mature. Corn yields on rotated acres ranged from 180 to 250 bushels/acre and averaged 215 bushels/acre. Continuous corn yields ranged from 180 to 230 bushels/acre and averaged 200 bushels/acre.

Soybean harvest began September 16 and was completed October 8. Soybean yields were slightly above average, except some fields with sclerotinia stem rot (white mold) disease. Soybean aphids did not reach the economic thresholds for control with only 25/plant recorded August 28, before populations dropped. Yields ranged from 55 to 85 bushels/acre and averaged 65 bushels/acre.

Weather Comments
Winter 2014–2015. The first measurable snowfall occurred November 12, 2014, and the last snow for the season was April 9, 2015, with a total of 42.7 in. recorded. The 4-in. soil temperature remained below 50°F after October 28, 2014, and the topsoil froze November 13, thawed nine days later, and then froze again, stopping tillage.

Spring 2015. The frost was out of the top 2 ft of soil after March 26 and the 4-in. average soil temperature remained above 50°F on April 26. In April, half of the days were suitable for field work and eight days had precipitation. This resulted in 4.33 in. of precipitation, which was 0.52 in. above the 30-yr average. The last killing frost was April
23 for sensitive vegetation. In May, 20 days were suitable for field work and 13 days had precipitation. However, all rains were light, which didn’t cause any major planting delays.

**Summer 2015.** Measurable rain occurred on 11 days in June, allowing ample time for weed control and nitrogen side-dress applications. In July, rainfall was slightly below the 30-yr average and August was slightly above, although most August rainfall came toward the end of the month. July and August air temperatures were between 1 to 2°F below the 30-yr average, with only four days in August with considerable heat stress before late August rains arrived. This increased the corn yields from a slow grain-fill period with little stress.

Corn pollination occurred primarily the week of July 20. Northern Corn Leaf Blight ranged from mild to severe depending on corn hybrids, with infection starting prior to pollination. Corn yields increased with timely fungicide applications. September and October heat units were slightly above normal, which allowed corn to mature prior to frost, with many farmers not needing to dry their corn to 15 percent moisture. Only eight days in the growing season had air temperatures at or above 90°F.

**Fall 2015.** Physiological maturity of corn occurred during late September/early October, depending on variety and planting date. The first killing freeze occurred October 17 (22°F), allowing all crops to mature. A total of 2,747 heat units were recorded from May through September of 2015, about 100 more than the previous two years. From April through November, 30.01 in. of rain was recorded, which was 0.46 in. above the 30-yr average and matched the research farms 40-yr average. September through October rainfall was 1.07 in. below normal with minimal harvest delays. We had a record 30 days with no rain during harvest. Grain moisture during corn harvest started at 21 percent October 9 and was 14 percent October 20. The 4-in. soil temperature remained below 50°F after November 19. November and December precipitation broke previous records, with 3.55 and 3.97 in., respectively. Some flooding occurred from a 3.38 in. rainfall in December. The topsoil didn’t freeze until after December 25, with some tile drainage installations taking place before the start of 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 2015 growing season.**

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (in.)</th>
<th>Departure from normal</th>
<th>No. days of rain</th>
<th>Temperature (°F)*</th>
<th>Departure from normal</th>
<th>Growing degree days</th>
<th>Days 90°F+</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>4.33</td>
<td>+0.52</td>
<td>8</td>
<td>50.5</td>
<td>+2.5</td>
<td>207</td>
<td>0</td>
</tr>
<tr>
<td>May</td>
<td>3.50</td>
<td>-0.91</td>
<td>13</td>
<td>60.4</td>
<td>+0.8</td>
<td>369</td>
<td>0</td>
</tr>
<tr>
<td>June</td>
<td>5.78</td>
<td>+0.45</td>
<td>11</td>
<td>69.1</td>
<td>+0.2</td>
<td>567</td>
<td>1</td>
</tr>
<tr>
<td>July</td>
<td>4.00</td>
<td>-0.65</td>
<td>8</td>
<td>70.8</td>
<td>-1.2</td>
<td>638</td>
<td>3</td>
</tr>
<tr>
<td>August</td>
<td>4.63</td>
<td>+0.28</td>
<td>8</td>
<td>67.9</td>
<td>-1.6</td>
<td>615</td>
<td>1</td>
</tr>
<tr>
<td>September</td>
<td>2.61</td>
<td>-0.18</td>
<td>7</td>
<td>68.1</td>
<td>+6.1</td>
<td>558</td>
<td>3</td>
</tr>
<tr>
<td>October</td>
<td>1.61</td>
<td>-0.89</td>
<td>3</td>
<td>51.9</td>
<td>+2.6</td>
<td>215</td>
<td>0</td>
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<tr>
<td>November</td>
<td>3.55</td>
<td>+1.84</td>
<td>9</td>
<td>41.1</td>
<td>+6.5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30.01</td>
<td>+0.46</td>
<td>67</td>
<td>1° hard freeze: 22°F (10/17/15)</td>
<td>8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*177 frost-free days
### Research Farm Projects

<table>
<thead>
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<th>Research Project/Demonstration</th>
<th>Project Leader</th>
</tr>
</thead>
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<tr>
<td>Alfalfa nutrient and management studies</td>
<td>B. Lang</td>
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<td>Asparagus variety trial</td>
<td>P. O’Malley</td>
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<td>Bt trait/corn variety × fungicide study</td>
<td>ISU NERF</td>
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<tr>
<td>Corn planting date × relative maturity study</td>
<td>M. Licht</td>
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<tr>
<td>Cover crop × N fertilizer timing × tillage study</td>
<td>J. Sawyer</td>
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<tr>
<td>Cover crop mixture studies in corn and soybeans</td>
<td>E. Juchems</td>
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<tr>
<td>Crop N rate × crop rotation studies</td>
<td>J. Sawyer/A. Mallarino</td>
</tr>
<tr>
<td>Crop rotation × corn variety × tillage × planting population study</td>
<td>ISU NERF</td>
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<td>Evaluation of corn rootworm insecticides and genetic seed traits</td>
<td>A. Gassmann</td>
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<td>Evaluation of energy usage with field implements and corn dryers</td>
<td>M. Hanna</td>
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<td>Evaluation of foliar fungicides, application timings, and seed treatments on corn and soybean diseases</td>
<td>A. Robertson/D. Mueller/</td>
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<td>Evaluation of gypsum rates on corn and soybean yields</td>
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<td>Evaluation of in-furrow, vegetative, and reproductive stage fungicide</td>
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<td>Evaluation of prairie seed mixes and mowing on prairie strip establishment</td>
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<td>Evaluation of soybean aphid flight populations from a suction trap monitor</td>
<td>L. Jackson/D. Williams</td>
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<td>Evaluation of soybean aphid foliar and seed treatment insecticides</td>
<td>D. Voegtlin/</td>
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<td>Evaluation of water tables, tiling methods, and tile spacing distances</td>
<td>D. Lagos-Kutz</td>
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<td>Evaluation of weed management strategies in corn and soybeans</td>
<td>E. Hodgson</td>
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<td>Home demonstration garden</td>
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<td>Hydrogeology water quality studies in the Devonian Aquifer</td>
<td>M. Owen</td>
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<td>Iowa Crop Improvement Association corn and soybean variety trials</td>
<td>C. Haynes</td>
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<tr>
<td>K rate × Bt rootworm isoline comparison study (2 studies)</td>
<td>B. Simpkins</td>
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<tr>
<td>Long-term P-K rate study</td>
<td>J. Rouse</td>
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<td>Long-term tillage × crop rotation studies</td>
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<td>Milkweed species × Monarch butterfly evaluation</td>
<td>A. Mallarino</td>
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<td>Nitrogen rates following fall injected swine manure</td>
<td>M. Al-Kaisi/M. Hanna</td>
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<td>R. Hellmich</td>
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<td>Pawpaw tree winter hardiness demonstration</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 × P source study</td>
<td>A. Mallarino</td>
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<td>Rate of lime study</td>
<td>ISU NERF</td>
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<tr>
<td>Soybean planting date × relative maturity study</td>
<td>M. Licht</td>
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<tr>
<td>Soybean seed treatment × disease control study</td>
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<tr>
<td>Water quality study (cover crops, crop rotation, fertilizer source/application timing)</td>
<td>M. Helmers/A. Mallarino</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>
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</tbody>
</table>

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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.

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- Demco Mfg. Company
- Dennis Weibke
- Gandy Company
- George Cummins
- ISU Entomology Department
- ISU Weed Science Department
- Jim Johnson
- Kruger Seed Company
- MBS Farms/Farmers Feed & Grain
- Midwest Plastic Products Inc.
- Monsanto Company
- Mitas North America, Inc.
- National Lab for Ag & Environment
- PCS Fertilizer
- Pioneer Hi-Bred International
- Plainfield Welding and Repair
- Raven Industries
- Smidt Crop Management, Inc.
- Spraying Systems Company
- Stutzman’s Incorporated
- Sukup Manufacturing
- Syngenta Crop Protection
- Syngenta NK Brand Seeds
- Winfield Solutions, LLC
- Yetter Manufacturing

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Northeast Research and Demonstration Farm
3321 290th Street
Nashua, IA 50658

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Experiments in Previous Annual Reports

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
Corn and Soybean Production with a Winter Rye Cover Crop RFR-A13118 ..................ISRF13-13
Effect of Plant Population and Row Spacing on Soybean Yield RFR-A13117 ............ISRF13-13
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
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on Yield of Corn and Soybean RFR-A10110 ..................................................................ISRF10-13
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Effect of Four Tillage Systems and Two Crop Rotations on Placement of P and K .....ISRF05-13
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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
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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
Row Width and Variety Effects on Soybean Yield ......................................................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