Northeast Research Farm Summary

RFR-A13108

Northeast Iowa Agricultural Experimental Association
2013–2014

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103 Curtiss Hall, ISU

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103 Curtiss Hall, ISU
Farm and Weather Summary

Ken Pecinovsky, farm superintendent

Farm Comments
Field days and tours. More than 500 people attended five field days at the ISU Northeast Research Farm (NERF) in 2013. More than 5,000 people visited the Borlaug Learning Center (BLC). The BLC hosted over 100 events ranging from farmland leasing/insurance meetings to agronomy, horticulture, and livestock extension trainings. The summer field day dealt with issues related to our wet spring and subsequent late plantings, with discussions on crop development, nitrogen management, glyphosate-resistant weeds and foliar diseases. The fall field day included information on the wet planting season with discussions on drying and storing wet crops and determining crop maturities, and yield and grain market projections. Soil drainage management was presented during a tile drainage installation demonstration on four acres of untiled ground near the research farm building site.

New projects. Evaluation of energy use with field implements and corn dryers, M. Hanna; Evaluation of cover crop mixtures in corn and soybeans, Iowa Learning Farms; Evaluation of in-furrow planter applied products and seed treatments, various researchers; Foliar fungicides and fertilizer/soil amendments in alfalfa, B. Lang.

Numerous studies looking at tillage, plant populations, row spacing, and fungicide use (foliar, seed treatment, application timings) in corn and soybeans were conducted by A. Robertson, X.B. Yang, D. Mueller, and ISU NERF.

Crop Season Comments
Field work began on April 26 (38 days later than in 2012). On April 28, oat and alfalfa plots were planted with slow emergence in wet soils following seeding. On May 2, 0.6 in. of rain and 5.1 in. of snow fell, followed by frequent rains until the end of June. The first planting dates of corn and soybeans occurred on April 28 and the next planting ‘window’ was May 13-19, despite 0.4 in. of rain during that week. Frequent rains only allowed another nine days that were marginally dry to plant and corn/soybean plantings were completed on June 20.

Corn harvest began on October 17 (1 month later than in 2012) and was completed November 11. Corn yields varied according to planting date, but all were above average, mostly as a result of a delayed October 20 frost date that allowed late planted corn to mature. Corn yields on rotated acres ranged from 170 to 230 bushels/acre and averaged 190 bushels/acre. Continuous corn yields ranged from 160 to 200 bushels/acre and averaged 175 bushels/acre.

Soybean harvest began on September 27 and was completed October 24. Soybean yields were good despite late plantings. Late-planted soybeans required an insecticide treatment for aphids. Soybean yields benefitted from 2.65 and 3.29 in. of rain in July and August, respectively. Yields ranged from 50 to 80 bushels/acre and averaged 55 bushels/acre.

Weather Comments
Winter 2012–2013. The first measurable snowfall occurred December 9, 2012, and the last snow for the season was on May 2, 2013, with a total of 37.2 in. recorded (18.5 in. more than the previous winter). The 4-in. soil temperature remained below 50°F after October 20, 2012, and the topsoil froze on December 9 stopping any further tillage.
Spring 2013. The frost was out of the top 2 ft of soil after April 29 (7 weeks later than 2012), and the 4-in. average soil temperature remained above 50°F on May 5. Corn and soybeans planted on April 30, began to emerge on May 16. The last killing frost was on May 12 (1 month later than 2012). Frequent rain events allowed three days in April, six days in May, and six days in June to plant crops, despite marginally wet soil conditions that may cause soil compaction issues in 2014. Corn and soybeans planted from May 13-17, with adequate sub-surface tile drainage, had the best final stands and grain yields, due to a 7-day period of warm weather (averaging 83.3°F) causing quick seedling emergence. Fields planted after May 17 had reduced plant stands, due to wet soil conditions where tile drainage was not adequate.

Summer 2013. Rain occurred on 14 days in June causing many farmers to never plant all of their crops with several planting cover crops in July and August or leaving the ground bare. In July, measurable rain fell on seven days and above normal air temperatures for the first three weeks helped crops catch up from late plantings. Corn pollination was about three weeks later than normal due to delayed planting. Cooler air temperatures during late July and August caused a slow grain-fill period, increasing yields despite low rainfall for the rest of the growing season. The soybean yields benefitted from 3.29 in. of August rain and delayed frost date.

Fall 2013. Corn silage was harvested in late September and physiological maturity of corn occurred in early October, depending on variety and planting date. A delayed October 20 plant-killing freeze (25°F) allowed late-planted crops to mature. A total of 2,639 heat units were recorded from May through September of 2013 compared with 2,862 in 2012. From April through November, 35.03 in. of rainfall was recorded, which was 5.19 in. above the 30-yr average.

September and October rainfall was 1.95 and 1.19 in. below normal with minimal harvest delays. This was helpful due to the late start of harvest. Delayed planting resulted in wetter corn grain moisture (24-28%) at harvest, requiring more liquid propane fuel to dry corn. The 4-in. soil temperature remained below 50°F after November 1. Topsoil froze on November 22, stopping any further tillage operations.

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 2013 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>6.40</td>
<td>+2.82</td>
<td>14</td>
<td>42.2</td>
<td>-5.5</td>
<td>85</td>
<td>0</td>
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<tr>
<td>May</td>
<td>9.92</td>
<td>+5.47</td>
<td>19</td>
<td>58.2</td>
<td>-1.1</td>
<td>344</td>
<td>1</td>
</tr>
<tr>
<td>June</td>
<td>8.22</td>
<td>+3.15</td>
<td>14</td>
<td>68.3</td>
<td>-0.6</td>
<td>548</td>
<td>2</td>
</tr>
<tr>
<td>July</td>
<td>2.65</td>
<td>-2.06</td>
<td>8</td>
<td>71.7</td>
<td>-0.4</td>
<td>645</td>
<td>10</td>
</tr>
<tr>
<td>August</td>
<td>3.29</td>
<td>-0.94</td>
<td>7</td>
<td>70.3</td>
<td>+0.6</td>
<td>615</td>
<td>4</td>
</tr>
<tr>
<td>September</td>
<td>1.14</td>
<td>-1.95</td>
<td>7</td>
<td>65.3</td>
<td>+3.5</td>
<td>487</td>
<td>3</td>
</tr>
<tr>
<td>October</td>
<td>1.46</td>
<td>-1.19</td>
<td>11</td>
<td>49.7</td>
<td>+0.4</td>
<td>199</td>
<td>0</td>
</tr>
<tr>
<td>November</td>
<td>1.95</td>
<td>+0.14</td>
<td>8</td>
<td>32.2</td>
<td>-2.7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35.03</td>
<td>+5.44</td>
<td>88</td>
<td>1st hard freeze: 25°F (10/20/13)</td>
<td>20</td>
<td></td>
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</table>

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

<table>
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<th>Project Leader</th>
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<td>B. Lang</td>
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<tr>
<td>Asparagus variety trial</td>
<td>P. O’Malley</td>
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<tr>
<td>Bt trait/corn variety × fungicide study</td>
<td>ISU NERF</td>
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<tr>
<td>Corn planting date × relative maturity × fungicide study</td>
<td>ISU NERF</td>
</tr>
<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>
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<tr>
<td>Crop N sensing × N rates study</td>
<td>J. Sawyer</td>
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<tr>
<td>Crop rotation × seed treatment × tillage × planting population study</td>
<td>ISU NERF</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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<tr>
<td>Evaluation of planter applied in-furrow seed treatment strategies</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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<tr>
<td>Evaluation of cover crops and nitrogen rates on corn</td>
<td>J. Sawyer</td>
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<tr>
<td>Evaluation of foliar fungicides, application timings, and seed treatments on corn and soybean diseases</td>
<td>A. Robertson/D. Mueller/XB Yang</td>
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<tr>
<td>Evaluation of humic acid and N rates on corn</td>
<td>D. Olk</td>
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<tr>
<td>Evaluation of multiple resistances to soybean aphids</td>
<td>E. Hodgson/M. O’Neal</td>
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<tr>
<td>Evaluation of soybean aphid and seed treatments</td>
<td>E. Hodgson</td>
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<td>Evaluation of soybean aphid flight populations from a suction trap monitor</td>
<td>D. Voegtlin</td>
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<tr>
<td>Evaluation of soybean varieties and soybean disease/insect control</td>
<td>ISU NERF</td>
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<tr>
<td>Evaluation of water tables, tiling methods, and tile spacing distances</td>
<td>ISU NERF</td>
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<tr>
<td>Evaluation of weed management strategies in corn and soybeans</td>
<td>M. Owen</td>
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<tr>
<td>Home demonstration garden</td>
<td>C. Haynes</td>
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<tr>
<td>Hydrogeology water quality studies in the Devonian Aquifer and near tile drainage</td>
<td>B. Simpkins</td>
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<tr>
<td>Insecticide and fungicide interactions in soybeans</td>
<td>D. Mueller</td>
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<tr>
<td>Iowa Crop Improvement Association soybean variety trials</td>
<td>J. Rouse</td>
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<tr>
<td>K rate × Bt rootworm isoline comparison study (2 studies)</td>
<td>A. Mallarino</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 × crop rotation studies</td>
<td>M. Al-Kaisi/M. Hanna</td>
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<td>Nitrogen rates following fall injected swine manure</td>
<td>ISU NERF</td>
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<tr>
<td>Oat variety study</td>
<td>ISU NERF</td>
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<tr>
<td>Pawpaw tree winter hardiness demonstration</td>
<td>P. O’Malley</td>
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<tr>
<td>Phosphorus and potassium placement and rate in different tillages</td>
<td>A. Mallarino</td>
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<tr>
<td>Phosphorus rate × P source study</td>
<td>A. Mallarino</td>
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<tr>
<td>Rate of lime study</td>
<td>ISU NERF</td>
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## Research Project/Demonstration (continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Project Leader</th>
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<tr>
<td>Soybean planting date × variety maturity × insecticide/fungicide</td>
<td>ISU NERF</td>
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<tr>
<td>Soybean population × row spacing study</td>
<td>T. Basol</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>
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<tr>
<td>Water quality with use of bioreactor</td>
<td>M. Helmers</td>
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</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.

- Agrigold Hybrids
- Agriliance, LLC
- AMVAC Corporation
- Asgrow Seed Company
- BASF Corporation
- Bayer Crop Science
- CSPMP Crop Consulting
- CDS-John Blue Company
- Dekalb Genetics
- Demco-Dethmers Mfg. Company
- Dennis Weibke
- Don Vetter
- Gandy Company
- George Cummins
- Great Plains Manufacturing Co.
- ISU Entomology Department
- ISU Weed Science Department
- Johnson Drainage Plows
- Kinze Manufacturing
- Kuhn-Krause Corporation
- Kruger Seed Company
- MBS Farms / Farmers Feed & Grain
- Midwest Pipe Supply
- Monsanto Company
- National Lab for Ag & Environment
- PCS Fertilizer
- Pioneer Hi-Bred International
- Plainfield Welding and Repair
- Spraying Systems Company
- Stutzman’s Incorporated
- Sukup Manufacturing
- Swartzrock Implement
- Syngenta Crop Protection
- Syngenta NK Brand Seeds
- Winterhaven Vineyard
- Yetter Manufacturing

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

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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

Corn and Soybean Production with a Winter Rye Cover Crop RFR-A1256 ............. ISRF12-13
Antibiotic Resistant Bacteria and Resistance Genes in Crop Fields RFR-A1260 ........ ISRF12-13
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
Hydraulic Performance of the Denitrification RFR-A11116 ...................................... ISRF11-13
Effect of Sulfur and Boron Fertilization on Alfalfa RFR-A11113 ............................... ISRF11-13
Corn Population Research RFR-A10112 ................................................................. ISRF10-13
The Suction Trap Network Documents Soybean Aphid Migrations RFR-A10105 ....... ISRF10-13
Phosphorus and Potassium Placement Methods and Tillage Effects
  on Yield of Corn and Soybean RFR-A10110 .......................................................... ISRF10-13
Crop and Soil Responses to Rates of Lime RFR-A9096 .......................................... ISRF09-13
Role of Directly Connected Macropores on Pathogen Transport
  to Subsurface Drainage Water RFR-A9116 ............................................................ ISRF09-13
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Soybean Yield Influenced by Planting Date and Plant Population ............................... ISRF05-13
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
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