

An aerial photograph of a farm. In the foreground, there are large fields of yellow and orange crops, likely soybeans. A white building with a flat roof is visible in the middle ground, surrounded by a paved area and some trees. In the background, there are more fields and a small town or village under a clear sky.

Farm and Weather Summary

Ken Pecinovsky—farm superintendent

Farm Comments

Field days and tours. More than 750 people attended 10 field day/farm tour events at the Iowa State Northeast Research and Demonstration Farm (NERF). Over 1,200 people visited the Borlaug Learning Center (BLC) and NERF. The BLC hosted over 50 events ranging from a three-day coop agronomist training event to a one-day planter workshop with three breakout sessions on different planter topics. Several livestock and crops extension trainings also were held, along with manure and pesticide applicator license trainings. At the March 16 association annual meeting, presentations were made on carbon market options for producers by Ann Johanns; challenges and opportunities of carbon storage and sequestration in Midwest landscapes by Keith Schilling; along with a review of 2021 research results. The June 22 summer field day included information on crop weather meteorological predictions for the 2022 season, Dennis Todey; soil fertility recommendations during high fertilizer prices by Antonio Mallarino; soybean cyst nematode management by Greg Tylka; and crop disease and tar spot management by Alison Robertson. A special corn rootworm management field day was held July 19 by Erin Hodgson. The August 24 fall field day included topics on carbon science for carbon markets by Lisa Schulte Moore; corn rootworm resistance management and new technologies by Erin Hodgson, Ashley Dean, Bill Long, and Edwin Benkert; soybean disease update by Steve Harris; and an update on the farm's water quality research project by Dan Anderson. Tours of field research studies were held during these field day events.

New projects. Corn variety x fungicide study looking at Tar Spot control, A. Robertson; Water use efficiency biostimulant product evaluation on corn and soybean, S. Archontoulis; soybean variety growth type x soybean population study, M. Licht; nitrogen byproduct study on corn, D. Anderson; soybean variety tolerance to SDS disease, S. Navi; and rye termination date x soybean study, NERF.

Crop Season Comments

In the fall of 2021, 4.5 in. and 2.0 in. of precipitation fell in October and November, respectively, causing tile lines to start draining excess water, after limited-to-no tile drainage for most of the growing season. Sump pumps were removed December 3, 2021, and re-installed into the 36-1 acre water quality plots March 18, 2022, with minor drainage flow through July 20 and essentially minimal-to-no flow through September 23 and no flow for the rest of the growing season. This is the second year in a row the farm produced higher-than-expected corn and soybean yields, with minimal soil moisture reserves until almost early to mid-August. Higher relative humidity and only five days above 90°F in August and September also helped increase yields, due to less plant stress.

Oat and legume seeding occurred April 11, 12 days later than 2021, due to frequent light snow and rain events, and below normal late March and early April temperatures that wouldn't allow the soil to dry. April precipitation (4.27 in. in 16 days) delayed spring fertilizer applications and planting. On April 19, spring manure injection treatments were applied in water quality plots and preplant nitrogen applications began. In planting date studies, the first timings were planted April 12, followed by 14-day planting intervals, ending June 1. The majority of corn and soybean plots were planted starting May 12 and completed May 18 for corn and soybean. Only three substantial rain events occurred in the growing season, on June 25 (2.76 in.), August 6 (2.87 in.) and August 28 (2.16 in.). The research farm received 26.03 in., (0.71 in. less than 2021).

Corn harvest began October 10 and was completed November 3. Corn yields were average to above average, about equal to 2021 yields, despite not having the windstorm and subsequent lodging as in 2021. High yields could be contributed to optimal heat unit accumulation, receiving 2,816 GDUs May-September, (71 less than 2021 and 167 GDUs more than the past 29 year average), no heat stress during grain fill and August rainfall (6.74 in.). Corn yields on rotated acres ranged from 190 to 260 bushels/acre and averaged 225 bushels/acre. Continuous corn yields ranged from 180 to 250 bushels/acre and averaged 205 bushels/acre. Soybean harvest began September 26 and was completed October 9. Minimal sudden death syndrome (SDS) and white mold disease occurred this year, along with no economic thresholds of soybean aphid populations. Yields ranged from 55 to 80 bushels/acre and averaged 65 bushels/acre. Moisture holding capacity in different soil types caused most of the yield variation, since the farm had below normal rainfall up until August 6. Grain harvest went fast due to only 0.68 and 0.07 in. rainfall during corn and soybean harvest, respectively.

Weather Comments

Winter 2021-2022. The first measurable snowfall occurred November 11, 2021, and the last snow for the season was April 2, 2022, with a total of 18.6 in. recorded (9.1 in. less than the previous winter). The average 4 in. soil temperature remained below 50°F after November 10, 2021. Fall manure injection and tillage operations were completed by November 7 and 30, respectively. January, February and April were the only months this year where air temperatures were below the 30-year average.

Spring 2022. The 4 in. average soil temperature remained above 50°F on May 6. Most farmers completed corn and soybean planting in mid-May (three weeks later than 2021) due to frequent and cooler than normal temperatures for April and the first eight days of May. The last killing frost occurred April 26. May had 20 days suitable for field work.

Summer. May, June and July rainfall was -0.4, -0.16, and -1.98 in. below the 30-yr. average, respectively, but crop stress was less than 2021, due to only eight days of air temperatures above 90°F from June through August, compared with 21 days in 2021. Corn pollination started July 19-25, depending on corn relative maturity rating, (8-10 days later than 2021), due to mid-May planting. Total August rainfall was 6.74 in. and growing degree day accumulation for April through harvest was above normal, allowing crops to mature with minimal artificial drying of corn.

Foliar crop diseases were minimal in corn and soybean, similar to the past few years at the research farm. Tar Spot disease symptoms showed up in early August. Due to only 2.55 in. of rainfall in July, the disease started too late to reach economic thresholds. Some areas of northeast Iowa received up to 11.5 in. of July rainfall and tar spot disease did have economic yield reductions, if fungicides were not applied, with some fields prematurely dying prior to physiological maturity. Summer heat unit accumulations were above normal, which allowed corn to mature prior to frost. Thirteen days in the growing season had air temperatures at or above 90°F (9 days less than the previous year).

Fall. The first killing freeze occurred October 8 (27°F), 15 days earlier than 2021. A total of 2,816 heat units were recorded from May through September. April through November, 26.03 in. of rain was recorded, which was 0.74 in. less than 2021, and 4.76 in. less than the 30-yr. average.

Corn grain moisture during harvest stayed in a narrow range of 16-23%, depending on relative maturity of the corn varieties planted and timing of harvest. The 4 in. soil temperature remained below 50°F after November 10. On October 5–6, fall seeded cover crops and cool season forages were no-till drilled and emerged October 21, despite only 0.10 in. rain. Farmer fields that had aerially applied cover crops had slow emergence due to minimal September and October rainfall. Fall manure injection, fall fertilizer applications and tillage operations were completed from November 11 through November 29. The soil surface remained frozen during December with air temperatures -2.0°F below the 30-yr. average.

Acknowledgements

Thanks to Northeast Iowa Agricultural Experimental Association, Iowa State researchers and extension staff, and agribusiness people for their support.

Table 1. Monthly rainfall and average temperatures during the growing season.

Month	Rainfall, inches			Temperature °F			
	NERF	Departure from normal	Days of rain	NERF	Departure from normal	Growing degree days	Days 90°F+
April	3.62	+0.01	15	42.91	-4.51	79	0
May	4.10	-0.40	11	61.70	+2.36	402	3
June	5.22	-0.16	9	70.67	+1.27	599	5
July	2.55	-1.98	8	73.10	+1.09	706	0
August	6.74	+1.94	10	70.78	+1.11	647	3
September	1.03	-2.48	5	64.12	+1.27	462	2
October	0.75	-1.96	4	50.27	+0.25	238	0
November	2.02	+0.27	7	36.71	+0.62		0
Total	26.03	-4.76	69	1st hard freeze: 26°F October 8, 2022			13

*165 frost-free days