

## **Ag Engineering and Agronomy Farm and Central Iowa Research Farms Summary**

**RFR-A20119**

### **Farms Staff**

**Ag Engineering/Agronomy Farm (AEA), 1308 U Avenue, Boone, IA  
515-296-4081 Ag Engineering office/515-296-4082 Agronomy office**

Superintendent ..... Mike Fiscus  
Manager, Ag Engineering ..... Nathan Meyers  
Ag Specialist ..... Zachary Koopman  
Ag Specialist ..... Nick Upah  
Farm Equipment Mechanic ..... Jeff Erb

**Central Iowa Farms (CIF), ISU Curtiss Farm, 2219 State Avenue, Ames, IA, 515-290-1498**

Superintendent ..... Kent Berns  
Ag Specialist (½ time CIF, ½ time CAD) ..... Karl Nicolaus  
Farm Equipment Operator ..... John Reinhart

**College Shop, 52099 260<sup>th</sup> Street, Ames, IA, 641-751-0280**

Farm Equipment Mechanic ..... Dan Crosman

**Committee for Agricultural Development (CAD), 103 Curtiss Hall**

**Seed Plant, 2219 State Avenue, Ames, IA, 515-291-0507**

Superintendent ..... Kevin Scholbrock  
Ag Specialist (½ time CIF, ½ time CAD) ..... Karl Nicolaus

**Compost Facility, 52271 260<sup>th</sup> Street, Ames, IA, 515-450-0581**

Ag Specialist ..... Steve Jonas  
Research Associate ..... Arlie Penner

**BioCentury Research Farm, 1327 U Avenue, Boone, IA, 515-296-6300**

Manager ..... Andrew Suby  
Building Services Specialist ..... Rob Hartmann

Associate Dean for Operations ..... Mark Honeyman  
Farms Manager ..... Tim Goode

103 Curtiss Hall, 513 Farm House Lane  
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## Ag Engineering and Agronomy Farm Farm and Weather Summary

Mike Fiscus, farm superintendent  
Nathan Meyers, manager

### Farm Comments

*Field days and tours.* The farm hosted 1,088 visitors during a virtual session held in late summer.

*Developments.* The farm continued essential field research projects under COVID-19 guidelines. Social distancing rules were required and followed among all farm staff and research projects when conducting field research. Research efforts at the farm were down just slightly, as most research efforts were deemed essential.

The farm escaped severe damage from the August 10 derecho event. Two machine doors were damaged, plus some tree damage at the residence. Crops sustained minor to moderate wind damage, with all of the corn and soybean crops harvestable. Some modifications were made to the combine corn head to help with the harvest of lodged corn. Nathan Meyers has submitted an article in this report of modifications made, and an analysis of harvesting lodged corn. Yields of corn and soybean crops were lower in 2020 due to the derecho and dry weather from mid-June through September.

*Facilities and equipment.* The Plant Pathology group constructed a new machine shed as an addition to their current facility at the AEA Farm. It will serve as machinery storage for plot and truck/trailer equipment. The shed features a full cement floor with electricity and two overhead doors. The addition of the new shed will allow for additional lab and workspace in the existing facility.

### Crop Season Comments

Oat seeding started March 31 and completed April 8. Oats were harvested in mid-July, with average yields of 110 bushels/acre.

Corn planting started April 22 and was completed by May 15. Harvest began September 18 and was completed by October 28. Yields averaged 172 bushels/acre, 20 to 30 bushels below normal. Dry weather in mid to late summer, and the derecho event August 10, contributed to the lower corn yields.

Soybean planting began May 8 and was completed by June 9. Harvest began September 21 and was completed by October 10. The whole farm average was 50 bushels/acre. Yield reductions were due to dry summer weather.

### Weather Comments

*Winter.* Total snowfall for January, February, and March was 14 in. with a rainfall equivalent of 3.91 in.

*Spring.* A rainfall total of 8.34 in. was recorded for the months of April, May, and June (Table 1). There also were two snow events April 15 and 17, which brought 1.2 in. of snow. The last killing frost occurred April 17, with a low temperature of 15°F. June was a very warm month, averaging 4.85°F above normal. There were 7 days of 90 degrees or above in June.

*Summer.* A total of 7 in. of rain fell during the summer months from July through September, which was 4.31 in. below normal, and led to reduced yields of corn and soybean. Warm temperatures in July and August also contributed some stress on the crops. Both months recorded 7 days of 90 degrees or above temperatures.

*Fall.* A total of 3.81 in. of rain was recorded for the months of October through December. The first killing frost occurred October 19, with 1 in. of snow on the same day. December recorded 7.5 in. of snowfall for the month.

A total of 23.06 in. of rain was recorded for 2020. The total moisture for the year was 9.27 in. below normal (Table 2).

**Table 1. Monthly rainfall and average temperatures during the 2020 growing season at the ISU Ag Engineering/Agronomy Research Farm, Boone, IA.**

Month	Rainfall (in.)		Avg. temperature (°F)		Days 90°F or above
	2020	Deviation from normal	2020	Deviation from normal	
March	2.65	0.86	42	6.08	0
April	1.49	-1.72	48	-1.67	0
May	5.28	0.83	60	-0.87	0
June	1.57	-3.23	75	4.85	7
July	2.79	-0.89	76	1.65	7
August	1.02	-2.98	73	0.99	7
September	3.19	-0.44	64	-0.37	2
October	1.07	-1.38	48	-4.49	0
Totals	19.06	-8.95			23

**Table 2. Ag Engineering/Agronomy Research Farm 11-yr summary of monthly precipitation.**

Mo.	NR <sup>1</sup>	ANR <sup>2</sup>	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Jan	0.79	0.79	1.17	0.70	0.26	0.41	0.10	0.19	0.60	1.85	1.31	0.54	0.76
Feb	0.94	1.73	0.75	1.06	1.74	0.73	1.15	0.94	0.68	1.20	1.16	1.70	0.05
Mar	1.79	3.52	2.07	0.79	2.49	1.48	1.00	0.21	1.48	3.11	2.49	1.50	2.65
Apr	3.23	6.75	3.66	4.41	4.79	5.81	4.75	3.45	4.09	3.06	1.27	1.94	1.49
May	4.41	11.16	3.64	4.62	2.46	7.09	4.26	4.57	4.28	6.16	3.98	8.32	5.28
Jun	4.83	15.99	11.17	5.05	2.94	3.01	8.86	6.90	0.97	1.73	11.10	3.97	1.57
July	3.68	19.67	6.74	3.90	1.47	1.01	2.88	5.96	5.85	0.99	4.21	4.61	2.79
Aug	4.02	23.69	11.21	3.58	2.98	2.18	5.70	8.26	8.23	3.34	8.41	1.30	1.02
Sept	3.62	27.31	6.57	2.02	1.85	1.19	5.55	5.05	7.90	1.80	6.75	4.56	3.19
Oct	2.43	29.74	0.38	0.86	2.34	2.50	3.75	1.27	0.59	6.07	4.85	5.24	1.07
Nov	1.53	31.27	2.23	2.72	0.90	1.40	0.71	2.75	1.74	0.26	1.62	1.33	1.95
Dec	1.05	32.32	0.80	2.23	1.02	0.32	1.15	5.05	1.17	0.17	2.62	1.08	0.79
Tot.	32.32		50.39	31.94	25.24	27.13	39.86	44.60	37.58	29.74	49.77	36.09	23.06
Departure from normal			18.07	-0.38	-7.08	-5.19	7.54	12.28	5.26	-2.58	17.45	3.71	-9.27

<sup>1</sup>NR = normal rainfall.

<sup>2</sup>ANR = accumulated normal rainfall.

## Project List

<u>Project-Agronomy Farm</u>	<u>Department</u>	<u>Project Leader</u>
Agrocete corn and soybean trial	Agronomy	S. Archontoulis
Bayer corn production water quality trial	Agronomy	S. Archontoulis/M. Castellano
BCRF plant zoo	BCRF	A. Suby
Bioreactor evaluation trial	ABE	M. Soupir
Cereal rye seeding rate/timing trial	Agronomy	M. Licht
Comparison of biofuel systems (COBS)	Agronomy	M. Liebman
Corn and soybean fungicide trials	Plant Pathology	A. Robertson
Corn and soybean hail study	Plant Pathology	D. Mueller
Corn and soybean yield trials	ICIA	J. Rouse
Corn breeding	Agronomy	J. Edwards
Corn breeding	Agronomy	P. Scott
Corn breeding	Entomology/USDA	C. Abel
Corn breeding/double haploid research	Agronomy	T. Lubberstedt
Corn breeding/nursery trial	Agronomy	P. Schnable
Corn breeding/plant pathology trials	Plant Pathology	N. Lauter
Corn breeding/sorghum breeding	Agronomy	J. Yu
Corn cover crop disease trial	Plant Pathology	A. Robertson
Corn greensnap trial	Agronomy	M. Licht
Corn gypsum fertility trial	Agronomy	A. Mallarino
Corn hybrid nitrogen efficiency trial	Agronomy	J. Edwards/S. Archontoulis
Corn rootworm research	Entomology/USDA	A. Gassmann
Corn seed health trial	Agronomy	M. Licht/M. McDaniel
Corn seedling disease research	Seed Science	G. Munkvold
DOP soybean relative maturity trial	ISU On-Farm	Z. Koopman/M. Witt
Drainage tile depth study installation	Agronomy	M. Castellano
Enviratron facility project	GDCB	S. Howell/S. Whitham
FEEL research plots	Plant Pathology	D. Mueller
Foliar AMS on soybean	ISU On-Farm	Z. Koopman/M. Witt
Foliar biological treatment on soybeans	ISU On-Farm	Z. Koopman/M. Witt
Forage and biomass production systems	Agronomy	K. Moore
Forecast and assessment of cropping systems trial (FACTS plots)	Agronomy	S. Archontoulis
Glycerin product soybean evaluation trial	Agronomy	M. McDaniel
Hermann Farm soil nutrient runoff/cover crop trial	Agronomy/ABE	A. Mallarino/M. Helmers
Humic acid corn and soybean trials	NLAE	D. Dinnes
LEBRC lab facility	ABE	B. Ramirez
Liventia corn trial	Agronomy	M. Licht
Long-term continuous corn tillage study	Agronomy	M. Al-Kaisi
Long-term nitrogen trial	Agronomy	S. Archontoulis
Long-term tillage study	Agronomy	M. Al-Kaisi
Miscanthus research	Agronomy	E. Heaton
Miscanthus/corn nitrogen trial	Agronomy	E. Heaton

<b><u>Project-Agronomy Farm (continued)</u></b>	<b><u>Department</u></b>	<b><u>Project Leader</u></b>
Mung bean research	Agronomy	A. Singh
Oat variety trial	Practical Farmers	M. Schnable
Organic corn breeding	Agronomy	J. Edwards/T. Lubberstedt
Organic cropping systems trial	NLAE	T. Sauer
Oxbow and bioreactor, Uthe Farm	ABE	M. Soupir
Pivot Bio corn trial	Agronomy	M. Castellano
Plant pathology corn-soybean tillage trial	Plant Pathology	D. Mueller
Plant pathology cover crop trial	Plant Pathology	S. Eggenberger
Plant pathology soybean disease trials	Plant Pathology	D. Mueller
Plot combine plant imaging trial	ABE	M. Darr
Poultry manure/water quality plots	ABE	M. Soupir
Prairie forbs establishment trials	Entomology/USDA	R. Hellmich
Robotic plant imaging study	ABE	L. Tang
Rye nitrogen utilization trial	Agronomy	J. Sawyer
Saturated buffer observation trials	NREM	T. Isenhardt
Soil compaction tire trial	ABE	S. Birrell
Soil cube project	ABE	M. Helmers
Soil dynamics lab	ABE	M. Tekeste/B. Steward
Sorghum breeding	Agronomy	M. Salas
Soybean aphid suction trap	Entomology	E. Hodgson
Soybean breeding	Agronomy	D. Singh
Soybean cyst nematode yield trials	Plant Pathology	G. Tylka/G. Gebhart
Soybean genetic mapping	USDA	J. Hayes
Soybean inoculant trial	Agronomy	S. Archontoulis
Soybean planting population study	ISU On-Farm	Z. Koopman/M. Witt
Soybean SCN trials and research	Plant Pathology	C. Marett/G. Tylka
Sustainable ag cropping systems	Agronomy	M. Liebman
Switchgrass variety trial	Agronomy	E. Heaton
TerraSync corn trial	Agronomy	M. Licht
Urea nitrogen rate corn trials	Agronomy	M. Castellano
USDA/plant physiology	NLAE	T. Sauer
Weed Science cover crop trial	Agronomy	P. Jha
Winter Rye Variety trial	Practical Farmers	M. Schnable

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 Heartland Ag Supply

Gandy Corporation  
 J & M Manufacturing  
 John Deere  
 Bayer CropScience  
 Nutrien Ag Solutions

## Central Iowa Farms Farm and Weather Summary

Kent Berns, farms superintendent

### Farm Comments

The ISU Central Iowa Farms consist of farmland in Story and Boone counties. There were 2,376 crop acres under Central Farms management in 2020, with 445 acres devoted to intensive plot research. The additional acres were used for large-scale research, equipment testing, silage production, and manure application. The student-managed Ag 450 Farm rented approximately 185 acres and sharecropped another 52 acres. The Ag 450 Farm also was hired to perform custom farm work on a portion of the Central Iowa Farms.

*New projects.* The tile zone wetland was created at South Woodruff. Small atmospheric monitoring plots were added to the Kitchen Farm.

Other tile and waterway repairs and improvements will continue. Cereal rye was broadcast spread on no-till acres after harvest. Oats were used as a cover crop on acres harvested for corn silage. The irrigator at the ISU Curtiss Farm was operated twice during the season. The east field at the Bilsland Farm was used for sprayer development. Construction began on the ISU Kent Feed Mill and Grain Complex at the Curtiss Farm.

### Crop Season Comments

The 2020 planting season was normal. Corn planting began April 20. Bulk soybean was planted early May. The summer was dry and the crop progressed at a pace slightly ahead of normal. Disease pressures were minor. Insect pressure seemed more than recent years.

A major derecho windstorm occurred August 10. The storm brought hail to the Bilsland Farm and soybean had over 60 percent adjusted hail loss. The wind insured corn fields had 2 percent to 46 percent adjusted wind loss.

Corn silage yields averaged 19 tons/acre at an 8-in. cut height with 65 percent moisture. A total of 306 corn acres were harvested for silage. Those acres were tilled and seeded to a cover crop. Bulk corn grain yields averaged 170 bushels/acre and harvest was completed mid-November.

Large field soybean planting began May 7 and was completed May 16. E3 soybean (soybean with three herbicide tolerant traits: 2,4-D, glyphosate, and glufosinate) were planted on approximately half of the bulk acres. Fall harvesting of down corn began September 25 at 19 percent moisture. Corn harvest completed late November. Soybean harvest began early October and was completed in late October.

Covid-19 affected plot research in 2020. Some projects were cancelled and some studies postponed. Other projects increased work in the Ames area because of travel restrictions, which made travel to outlying farms more difficult.

### Weather Comments

The Ag Engineering/Agronomy Farm weather summary (Table 1, page 3) represents the weather data for all of the farms in central Iowa covered by this report.

## **Project List**

<b><u>Project-Central IA Farms</u></b>	<b><u>Farm Location</u></b>	<b><u>Project Leader</u></b>
2020 evaluations + graduate	Curtiss Farm	D. Franzenburg
COC, rootworm evaluation/trap	Johnson 16, 17	A. Gassmann
Conditioner/surfactant eval	West Curtiss 2	D. Franzenburg
Continuous corn plot 100+yrs	Animal Science	M. Honeyman
Corn aphid	Johnson 1	G. Vannostrand
Corn disease	West Curtiss 2	S. Navi
Corn genetics nursery	Curtiss	P. Becraft
Corn genetics nursery	Section 19	T. Bierwagen
Corn genetics nursery	Curtiss	T. Bierwagen
Corn genetics nursery	Curtiss	L. Coffey
Corn genetics nursery	Johnson	L. Coffey
Corn genetics nursery	Section 19	U. Frei
Corn genetics nursery	Curtiss 8	M. Hufford
Corn genetics nursery	Curtiss 8	T. Peterson
Corn genetics nursery	Section 19	E. Vollbrecht
Corn isolation	Packer	C. Gardner
Corn isolation	Equine	T. Peterson
Corn isolation 3x	Beef Teaching	J. Yu
Corn modeling vs maturity	East Curtiss	B. Hornbuckle
Corn nursery	Curtiss	D. Wright
Corn nursery	Section 19	P. Scott
Eddy covariance plots	Kitchen	A. Vanlooke
First year corn insect	North Woodruff	A. Gassmann
First year corn insect	Johnson 13	A. Gassmann
Foliar feeding evaluation	Bulk	A. Dean
Genetics grow out, non-irrigated	Curtiss 10/12	E. Vollbrecht
Genetics nursery irrigated	Curtiss 10	E. Vollbrecht
Hansen LC Plot	Hansen	B. Hornbuckle
Hoops	Curtiss 5 and 9	D. Franzenburg
IDC x cover crop	Johnson 19	L. Leandro
Imaging	Bennett	L. Coffey
Insect cages/population survey	Section 19	A. Dean
Insect cages/population survey	Dairy	R. Ritland
Japanese beetles	Johnson 6	G. Vannostrand
Machinery fallow	Boone County	M. Darr
Machinery test track	East Dairy	M. Darr
Maintain SCN levels	South Woodruff	C. Marett
Milkweed	Johnson 22	R. Hartzler
Miscanthus in potholes	North Woodruff	E. Heaton

<b><u>Project-Central IA Farms (continued)</u></b>	<b><u>Farm Location</u></b>	<b><u>Project Leader</u></b>
Miscanthus in potholes	South Woodruff	E. Heaton
Moisture based modeling	East Curtiss	B. Hornbuckle
Monarch	East Curtiss	R. Helmich
Nitrogen rate imaging	Kelley	L. Coffey
Nitrogen rate imaging	Bennett	L. Coffey
Nutrient placement	Boone County	M. Darr
Off year	West Curtiss Farm	D. Franzenburg
Pipeline recovery	North Woodruff	E. Ebrahimi-Mollabashi
Poplar tree propagation	Applied Science	D. Buchman
Pothole water quality	Section 19	A. Kalieta
Prairie seeding ratios	South Woodruff	B. Wilsey
RW trait	Johnson 7 c-c	A. Gassmann
RW trait	Kelley c-c	A. Gassmann
Saturated buffer	West Dairy	T. Isenhardt
Soybean disease	Johnson 3,4,5	S. Wiggs
SCN planting	Johnson	G. Gebhart
SDS x cover crop	Hinds 9	L. Leandro
Seedcorn maggot	North Woodruff	A. Gassmann
Seedcorn maggot	Johnson 8	A. Gassmann
Soil gas flux sampling	Been	S. Hall
Soil gas flux sampling	North Woodruff	S. Hall
Sorghum breeding	Curtiss 5	M. Salas
Sorghum cold vigor evaluation	Curtiss 5	M. Salas
Sorghum genetics	South Woodruff	K. Scholbrock
Sorghum genetics	Applied Science	K. Scholbrock
Soybean at Dairy Farm	Main Dairy	D. Franzenburg
Soybean cages/grow out	Johnson 3	I. Valmorbidia
Soybean disease	West Curtiss 4	S. Navi
Soybean nursery	Curtiss	D. Wright
Soybean pathology	Hinds 10/Johnson North	S. Wiggs
Sprayer development	Boone County	M. Darr
Swan tracking	Kelley	S. Dinsmore
Tile zone wetland	South Woodruff	W. Crumpton
Trap crop	Johnson	A. Gassmann
Water quality	USDA plots	B. Knutsen
Waterhemp	Johnson 23/Moore	R. Hartzler
Weed population	Curtiss 9 and 5	D. Franzenburg
Weed resistance	Vet Med	D. Franzenburg
Wildlife population sampling	Kelley	A. Janke