

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

**RFR-A14112**

## **Farms Staff**

### **Ag Engineering/Agronomy Farm**

Manager, Agronomy Farm..... Mike Fiscus  
Manager, Ag Engineering Farm ..... Richard VanDePol  
Manager, Operations..... Will Emley  
Ag Specialist, GPS Technologies ..... Nathan Meyers  
Ag Specialist, On-Farm Cooperator Trials ..... Zachary Koopman

Farm Equipment Mechanic..... Jeff Erb  
Farm Equipment Operator ..... Dan Crosman  
Farm Equipment Operator ..... Dale Niedermann

### **Central Iowa Farms**

Superintendent ..... Kent Berns  
Farm Equipment Operator ..... John Reinhart

### **BioCentury Research Farm**

Manager ..... Andrew Suby  
Ag Specialist ..... Nathan Meyers

Research Farms Coordinator..... Mark Honeyman  
Farms Manager ..... Tim Goode

103 Curtiss Hall  
Iowa State University

Ag Engineering/Agronomy Research Farm

1308 U Avenue

Boone, IA 50036

515-296-4081 Ag Engineering office phone

515-296-4082 Agronomy office phone

Location: West of Ames on Highway 30, across from the United Community School

Central Iowa Research Farms

in Story and Boone counties

ISU Curtiss Farm

2219 State Avenue

Iowa State University

Ames, IA 50014

515-290-1498

## Ag Engineering and Agronomy Farm Farm and Weather Summary

Mike Fiscus, ag specialist  
Richard VanDePol, ag specialist

### Farm Comments

*Field days and tours.* The Ag Engineering and Agronomy (AEA) Farm hosted a total of 535 visitors at the farm in 2014. Visitors included a group of 8<sup>th</sup> grade students from the West Delaware School District and a group of agronomists from China. We also hosted 331 visitors from the countries of Brazil, Argentina, Russia, Cambodia, Niger, and India in association with the Farm Progress Show during the last week of August. On September 10, we hosted the 50<sup>th</sup> anniversary celebration of the Ag Engineering and Agronomy Farm, celebrating its history and research activities at the current Boone County location. The farm was established in 1964. Many former faculty members, research associates, students, and employees attended a mid-day event that included a slide show of past events, a machinery display of current and past equipment used at the farm, and a lunch with grilling provided by the ISU Agronomy Club. There were 150 visitors in attendance for the celebration.

*Developments.* Installation of a new weather station was completed as part of the ISU statewide system. The new station records air temperature, rainfall, soil temperature depths from 4 to 50 in. deep, wind speed and direction, solar radiation, and soil moisture levels from 12 to 50 in. Data from this station can be accessed via the ISU Mesonet Site.

*Facilities and equipment.* A new boiler was installed in the main building to replace the original boiler that was installed in 1964. A new shop ventilation system was installed to remove exhaust fumes from inside the shop. An 11,000-bushel grain drying bin was

erected at the Marsden Farm and used to dry a portion of the 2014 harvest.

Two John Deere 9450 combines were converted to utilize a Harvest Master weigh system for collection of plot weights in corn, soybean, and small grains. A total of 5,033 plots were harvested with the two machines for several ISU research projects from the Agronomy, Ag Engineering, Plant Pathology, and Entomology departments.

*New projects.* A new water quality study was initiated in the Field 5 area. Nine concrete bunker style containers (bioreactors) were installed to be filled with wood chips as a medium to run tile water through. This will study the effects of microbial removal of nutrients from the tile water. Actual operation will begin in 2015.

The ISU Hermann Farm will be the site of a water quality, cover crop, and fertility study. This study was initiated in 2014 and will be the responsibility of the AEA Farm. The study has several flumes to measure and sample runoff.

The LEBRC (Livestock Environment Building Research Center) facility on the east side of the farm was remodeled in order to receive live birds (chickens) for an upcoming study.

### Crop Season Comments

Oat seeding was completed April 9. The oats were harvested in mid-July, with average yields of 75 bushel/acre.

Corn planting started April 23 and was completed by June 25. Harvest began September 29 and was completed by

November 10. Yields were variable with a range of 135–220 bushels/acre.

Soybean planting began May 6 and was completed June 16. Harvest began October 10 and was completed October 28. Yields ranged from 35–68 bushels/acre.

### Weather Comments

*Winter.* Total snowfall of 29.5 in. was recorded with a total moisture equivalent of 1.95 in., including rainfall and snowfall events.

*Spring.* A rainfall total of 10.01 inches was recorded for the months of March, April, and May. The last frost date was April 17, with the last hard freeze on April 18. Soil temperatures

at the 4-in. depth began to average 50°F on April 20, then cooled into the 40s again until April 28, when they returned to the 50s.

*Summer.* A total of 17.44 in. of rain fell during the summer months of June through August. Rainfall for June was 8.86 in., with 5.7 in. received in August. A total of 10.04 in. of rain came during August 1 through September 13.

*Fall.* A total of 10.01 in. of rain was recorded for September through November with the first measurable snowfall of 1 in. falling on November 15. The first hard freeze occurred on October 31 with a temperature of 25°F.

A total of 39.86 in. of rain was recorded for 2014, 7.74 in. above normal (Table 2).

**Table 1. Monthly rainfall and average temperatures during the 2014 growing season at the ISU Ag Engineering/Agronomy Research Farm, Boone, IA.**

Month	Rainfall (in.)		Temperature (°F)		Days 90°F or above
	2014	Deviation from normal	2014	Deviation from normal	
March	1.00	-0.80	36	-3	0
April	4.75	1.51	50	0	0
May	4.26	-0.15	61	+1	0
June	8.86	4.05	70	+1	0
July	2.88	-0.80	74	-4	0
August	5.70	1.78	72	-1	2
September	5.55	1.99	64	-2	1
October	3.75	1.34	52	-1	0
Totals	36.75	8.92			3

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

Mo.	NR <sup>1</sup>	ANR <sup>2</sup>	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Jan	0.80	0.80	0.71	0.50	0.62	0.56	0.24	0.95	1.17	0.70	0.26	0.41	0.10
Feb	0.93	1.73	1.41	1.83	0.41	1.77	0.71	0.25	0.75	1.06	1.74	0.73	1.15
Mar	1.78	3.51	3.52	1.38	2.63	3.09	2.71	4.07	2.07	0.79	2.49	1.48	1.00
Apr	3.24	6.75	2.40	3.29	4.30	5.99	5.22	4.56	3.66	4.41	4.79	5.81	4.75
May	4.41	11.16	8.18	4.38	2.15	6.67	8.49	3.78	3.64	4.62	2.46	7.09	4.26
Jun	4.82	15.98	3.59	4.89	0.81	2.03	10.68	4.11	11.17	5.05	2.94	3.01	8.86
July	3.66	19.64	1.96	4.10	5.56	2.95	9.28	2.75	6.74	3.90	1.47	1.01	2.88
Aug	3.92	23.56	5.19	6.76	6.16	7.89	2.10	4.84	11.21	3.58	2.98	2.18	5.70
Sept	3.56	27.12	1.34	4.36	7.51	1.90	3.09	0.96	6.57	2.02	1.85	1.19	5.55
Oct	2.41	29.53	1.79	0.35	2.53	5.41	3.63	7.33	0.38	0.86	2.34	2.50	3.75
Nov	1.54	31.07	3.01	1.89	1.56	0.14	2.59	1.38	2.23	2.72	0.90	1.40	0.71
Dec	1.02	32.09	0.46	0.94	2.67	1.90	1.20	1.96	0.80	2.23	1.02	0.32	1.15
Tot.	32.09		33.56	34.67	36.91	40.30	49.94	36.94	50.39	31.94	25.24	27.13	39.86
Departure from Normal			1.45	2.56	4.80	8.19	17.83	4.83	18.28	-0.17	-6.84	-4.98	7.77

<sup>1</sup>NR = normal rainfall.<sup>2</sup>ANR = accumulated normal rainfall.

## Project List

### Project-Agronomy Farm

Alternative biomass cropping research  
 BCRF plant zoo  
 Biochar research trials  
 Canola date of planting study  
 Canola sustainable cropping rotation  
 Comparison of biofuel systems (COBS)  
 Corn and sorghum water use trial  
 Corn and soybean date of planting studies  
 Corn breeding  
 Corn breeding  
 Corn breeding  
 Corn breeding  
 Corn breeding  
 Corn nitrogen volatilization trial  
 Corn plant population study  
 Corn residue removal study  
 Corn rootworm research  
 Corn rootworm/plant pathology trials  
 Corn stover/biomass research trials  
 Corn/soybean cover crop research  
 Corn stover biomass removal trial  
 Corn yield trials and observation plots  
 FEEL research plots  
 Forage and biomass production systems

### Department

Agronomy/NREM  
 BCRF  
 Agronomy  
 Agronomy  
 Agronomy  
 Agronomy/ABE  
 Agronomy  
 Agronomy  
 Agronomy  
 Agronomy  
 Agronomy  
 Entomology/USDA  
 Agronomy  
 Agronomy/Extension  
 Agronomy  
 USDA  
 Plant Pathology  
 Ag/Biosystems Eng  
 Agronomy  
 ABE/USDA  
 ICIA  
 Agronomy/Plant Path  
 Agronomy

### Project Leader

E. Heaton/L. Schulte-Moore  
 A. Suby  
 D. Laird  
 M. Wiedenhoef  
 M. Wiedenhoef  
 M. Liebman/M. Helmers  
 A. VanLoocke  
 M. Licht  
 J. Yu  
 J. Edwards  
 P. Scott  
 T. Lubberstedt  
 C. Abel  
 J. Sawyer  
 M. Licht  
 M. Al-Kaisi  
 A. Gassmann  
 N. Lauter  
 S. Birrell  
 J. Sawyer  
 S. Birrell/D. Karlen  
 J. Rouse  
 D. Mueller  
 K. Moore

**Project-Agronomy Farm (continued)**

<b><u>Project-Agronomy Farm (continued)</u></b>	<b><u>Department</u></b>	<b><u>Project Leader</u></b>
Forage species study (Independent Co.)	Agronomy	K. Moore/Dow Chem.
Global maize production study	Agronomy	J. Sawyer
Humic acid study	USDA	D. Dinnes
Long-term continuous corn tillage study	Agronomy	M. Al-Kaisi
Long-term nitrogen trial	Agronomy	J. Sawyer
Long-term tillage study	Agronomy	M. Al-Kaisi
Organic corn breeding	Agronomy	J. Edwards
Organic cover crop research	Agronomy	K. Delate
Plant Pathology corn-soybean tillage trial	Plant Pathology	D. Mueller
Plant Pathology soybean disease trials	Plant Pathology	D. Mueller
Soil fertility research	Agronomy	A. Mallarino
Sorghum breeding	Agronomy	M. Salas-Fernandez
Soybean and corn emergence trials	Seed Science	S. Goggi
Soybean and corn Plant Pathology trials	Plant Pathology	A. Robertson
Soybean breeding	Agronomy	W. Fehr
Soybean breeding	Agronomy	D. Singh
Soybean cyst nematode trials	Plant Pathology	G. Tylka/S. Cianzio
Soybean disease research	Plant Pathology	L. Leandro
Soybean disease trials and research	Plant Pathology	C. Marett/G. Tylka
Soybean production research	Agronomy	A. Lenssen
Soybean/corn disease research	Seed Science	G. Munkvold
Sustainable ag cropping systems	Agronomy	M. Liebman
Switchgrass/miscanthus research	Agronomy	E. Heaton

**Projects on site, Ag Engineering**

<b><u>Projects on site, Ag Engineering</u></b>	<b><u>Project Leader</u></b>
Ag drainage well	M. Helmers
Biomass harvest systems	M. Darr
Biomass harvesting	S. Birrell/John Deere
Bioreactors	M. Soupir
COBS project-South Reynoldson Farm	M. Helmers/M. Thompson/M. Liebman
LEBRC Lab	AEA Farm/R. VanDePol
Manure/water quality plots	M. Soupir
Teaching (GPS technology)	M. Darr
Soil nutrient/biomass harvest	S. Birrell/D. Karlen/USDA
Wetlands	M. Helmers
USDA organic/water quality plots	C. Cambardella
USDA plots	USDA researchers and Syngenta
USDA/plant physiology	T. Kaspar

## Central Iowa Farms Farm and Weather Summary

Kent Berns, superintendent

### Farm Comments

The ISU Central Iowa Farms consist of farmland in Story and Boone counties. There were 2,261 crop acres under Central Farms management with 370 acres devoted to intensive small 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 433 acres, of which 59 acres were 50/50 sharecropped. The Ag 450 Farm also was hired to perform custom farm work on a portion of the Central Iowa Farm acres.

We continued to make numerous tile and waterway repairs and improvements at many farms. Construction was completed on a 60 ft × 128 ft machine shed. A 105 horsepower tractor was purchased to replace a similar sized 20-yr old tractor. A 16-row electric drive planter was purchased to replace the 12-row planter. A bulk box seed tender also was purchased.

*Projects.* A project list is available in this report.

### Crop Season Comments

The 2014 season again was extremely challenging with cool temperatures and excessive precipitation. Our planting start and progression was delayed numerous times

while waiting for software updates for the new planter. June had very few days for spraying or nitrogen side dressing. An airplane was hired to complete nitrogen application.

Japanese beetle populations crashed and were not a problem during the 2014 season. A few soybean plots at the Curtiss Farm required treatment for soybean aphid. Northern leaf blight and other diseases were evident in certain hybrids. 2014 was the 100th year for the continuous corn plot.

Corn planting began on May 4 and was completed on May 19. Corn silage yields averaged 22 tons/acre at a 16-in. cut height and at 67 percent moisture. 375 corn acres were harvested for silage. Bulk corn grain yields averaged 194 bushels/acre. Harvest primarily occurred in November.

Soybean planting began on June 8 and was completed on June 24. Soybean aphid levels remained low during the growing season. Yields averaged 48 bushels/acre. Fall harvesting of corn and soybeans began on October 3 and was completed on November 21.

### 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 Iowa Farms</u></b>	<b><u>Farm Location</u></b>	<b><u>Project Leader</u></b>
Prairie × rodent	Applied Science	B. Mortensen
Corn isolation	Applied Science	F. Engstrom
Forestry breeding	Applied Science	R. Hall
Isolation	Beach Bottom	J. Edwards
Corn isolation	Beach Bottom	G. Fuente
Corn isolation 3x	Beef Teaching	P. White
Corn remote sensing	Been	B. Hornbuckle
Inbred growout	Bennett	J. Edwards
Monsanto trial	Bennett	G. Gebhart
Soybean SCN yield trial	Bennett	G. Gebhart
Sprayer guidance	Bilsland	M. Darr
Bee hive	Century Corn Plot	G. Morgal
Bee survey	Curtiss	T. Baker
Growout	Curtiss	X.B. Yang
Breeding, irrigated	Curtiss	P. Becraft
Breeding, irrigated	Curtiss	L. Coffey
Weed science	Curtiss	D. Franzenburg
Weed science	Curtiss	D. Franzenburg
Corn nursery	Curtiss	M. Hufford
Soybean breeding	Curtiss	L. Li
Captiva study	Curtiss	M. Johnson
Corn nursery	Curtiss	M. Muszynski
Corn nursery	Curtiss	A. Myers
Breeding, irrigated	Curtiss	T. Peterson
Breeding, irrigated	Curtiss	E. Vollbrecht
Breeding, non-irrigated	Curtiss	E. Vollbrecht
Breeding, irrigated	Curtiss	K. Warnberg
Soybean disease	Curtiss	S. Wiggs
Corn isolation	Dog Track	L. Coffey
Sorghum breeding	East Curtiss	M. Salas-Fernandez
Teaching plots	Hanson	E. Christian
Forensics	Hinds	J. Berry
Forestry breeding	Hinds	E. Hall
Miscanthus nursery	Hinds	E. Heaton
SDS	Hinds	L. Leandro
Soybean white mold	Hinds	S. Navi
Soybean charcoal rot	Hinds	S. Nav
Soybean pathology	Hinds	S. Navi
Mesocosms	Hinds	A. Van Der Valk
Soybean pathology	Hinds	S. Wiggs
Soybean pathology	Hinds	G. Gebhart
Floral provisioning	Johnson	T. Baker
Corn insects	Johnson	R. Helmich
Micro nutrient	Johnson	A. Mallarino
Plant Path	Johnson	G. Munkvold
No-till soybeans	Johnson	G. Munkvold

<b><u>Project-Central Iowa Farms</u></b>	<b><u>Farm Location</u></b>	<b><u>Project Leader</u></b>
Syngenta	Johnson	G. Vannostrand
Syngenta	Johnson	G. Vannostrand
Bayer	Johnson	G. Vannostrand
Japanese beetle	Johnson	G. Vannostrand
Entomology	Johnson	A. Varenhorst
Seedcorn maggot	Johnson	P. Weber
Black cutworm	Johnson	P. Weber
Rootworm trials	Johnson	P. Weber
Soybean cover crop	Main Dairy	A. Lenssen
Herbicide × hybrid evaluation	North Woodruff	D. Franzenburg
Corn isolation	North Packer	G. Fuente
Fuel consumption	Numerous	M. Hanna
Harvest performance	Numerous	M. Darr
Stover harvest	Numerous	M. Darr
Precision/modeling	Numerous	M. Darr
Isolation	Packer	J. Edwards
Corn isolation	Pony Track	L. Coffey
Wireworm	Ruminant Nutrition	P. Weber
Corn isolation	South 16th	T. Peterson
Soybean future scn	South Woodruff	G. Gebhart
SCN yield trials	South Woodruff	G. Gebhart
Corn nursery	South Woodruff	M. Muszynski
Corn isolation	South Woodruff	E. Vollbrecht
Switchgrass × N	South Woodruff	E. Heaton
Corn nursery	South Woodruff	L. Li
SCN	South Woodruff	C. Maret
Fungicide trial	South Woodruff	J. Shriver
Corn cover crop	West Curtiss	A. Lenssen
Entomology	West Curtiss	A. Varenhorst
Seed treatment	West Curtiss	C. Arnold
Forensics	West Dairy	J. Berry
Corn isolation	West Old Dairy	L. Coffey
Nursery	Woodruff	P. Becraft
Regulatory nursery	Woodruff	T. Bierwagen
Regulatory nursery	Woodruff	T. Peterson
Regulatory nursery	Woodruff	E. Vollbrecht