

Horticulture Research Station Summary

RFR-A1901

Farm Staff

Superintendent Nick Howell
 Agricultural Specialist Brandon Carpenter
 Agricultural Specialist Chad Arnold
 Field Lab Technician Lynn Schroeder
 Equipment Operator Jeff Braland
 Turfgrass Research Associate Ben Pease

Associate Dean Mark Honeyman
 Farms Manager Tim Goode
 103 Curtiss Hall, ISU

Horticulture Research Station
 55519 170th Street
 Ames, IA 50010
 515-232-4786 office and Fax
 nhowell@iastate.edu

Location: Three miles north of Ames on Highway 69,
 turn east on 170th Street about 1½ miles.

Farm and Weather Summary

Nick Howell, farm superintendent

Farm Comments

Staffing. Permanent staff remained unchanged in 2019.

Graduate students. Jean Yost continued as a graduate assistant working on hydroponic greenhouse research. Moriah Bilenky finished her M.S. degree and will continue with her Ph.D. under the direction of Ajay Nair in 2020. Former undergraduate student Taylor Mauch will fill Moriah's assistantship in May 2020 and will work in vegetable production.

Students. This season two students completed internships. Azucena (Suzie) Castillo, senior in agronomy, completed a student internship managing a food production enterprise from planting to harvest. This included choosing and growing crops and marketing the produce on the station's FoodLo.cals website. A variety of vegetables were grown, including several pepper varieties, kale, eggplant, kohlrabi, cabbage, carrots, beets, and other vegetables. Sam Blair, senior in ag systems technology, grew tomato varieties in high tunnels for the FoodLo.cals website.

Research. The Horticulture Station's main function continues to be research. With 84 projects and 27 investigators involved, the range of projects was diverse. Hops, apples, grapes, peppers, garlic, cantaloupe and other melons, sweet potatoes, soybeans, and corn were grown for research. Ornamental crops, such as turfgrass, shade trees, and herbaceous perennials also were used for research purposes. Projects involving bees, wasps, and tree swallows added more research diversity.

One significant new project under Ajay Nair was different types of biodegradable mulch. Research on the benefits of incorporating

chickens as a nutrient source in vegetable production was concluded. Nair continued looking at fertility rates in sweet potato production in 2019.

With Diana Cochran's departure from ISU, hops research was completed. This research looked at water and fertilizer requirements for hops production. In addition, a hops cultivar selection trial was completed.

Jennifer Savits of the Department of Food Science and Human Nutrition conducted several grape quality experiments in the vineyard.

In turfgrass, Adam Thoms' research focused on products and practices for athletic field management.

Grace Wilkinson and Mike Weber researched the effects of nutrient loads on aquatic life in bodies of water using the newly renovated ponds at the Aquatic Research Facility. After seven years, this facility was brought back into use after the installation of 90 tons of bentonite in 2018.

Landscape and infrastructure. In 2019, the station began clearing the remnant oak/hickory savanna and adjacent timber of invasive and non-native plant species. With a series of burns and weed kills over the next two years, the goal is to restore the savanna and woodland ecosystems to pre-settlement conditions. This project is part of the larger prairie restoration, which started in 2015.

The station began a tree replanting program in 2019. Burr, White, and Red oaks were planted in locations where other dead and dying trees had been removed. In all, 13 trees were planted.

Infrastructure improvements continued in 2019. The original sections of irrigation dating to the farm's construction in 1967 were abandoned and replaced. New laterals were installed so the land can be irrigated with both overhead and trickle irrigation. In addition, a new trickle irrigation system was installed in the orchards, allowing better management of fruit size. With all of the irrigation improvements, virtually all tillable land has access to irrigation.

Construction of a new rolling high tunnel began in 2019. Donated by Rimol Greenhouse Systems, this high tunnel will be rolled on tracks to three locations. This will allow research on food crop rotations in rolling tunnels for the industry.

Improvements in the shop included covering the interior walls with white sheet metal. This and the addition of task lighting made the shop a brighter and safer workspace.

Industry and the public. The research station hosted seven field days in 2019 for people interested in vegetable and fruit production, turfgrass, cover crops, general home gardening, bees, and pollinators. The most notable was the Iowa Honey Producers Association field day. This first time day-long event in mid-June offered visitors information on new honey production equipment to honey judging. Tours and demonstrations at the bee facility and prairie were offered. More than 120 people attended.

In addition to field days, the farm hosted 17 tours and five other events and meetings for the public. Over 900 people visited the station in 2019.

Weather Comments

Winter 2018-2019. Extremely cold temperatures (polar vortex) caused significant damage to the high tunnel peaches and some apple varieties that were over cropped in 2018. Significant damage also occurred to the hops planting as a result of the cold conditions.

Spring 2019. A slow warm-up brought the apples and grapes out of dormancy about two weeks later than normal. Precipitation was above normal in May, causing a delay in the planting of annual vegetable and bulk corn crops. Cooler than normal highs and lows in March, April, and May were experienced.

Summer 2019. Above normal precipitation delayed planting projects until June. Dry conditions continued into August resulting in heavy crop irrigation. Lake water levels dropped 18 in. during this period. Temperatures remained below normal.

Fall 2018. Well above normal precipitation and below normal high and low temperatures resulted in a delay in root and bulk crop harvest. Pumpkin quality and harvest also was affected by the excessive moisture. Apple and other vegetable crop harvests were unaffected by weather conditions.

Acknowledgements

I would like to thank the farm crew of Brandon Carpenter, Chad Arnold, Lynn Schroeder, Jeff Braland, Ben Pease, and Diane Krause, and graduate students Moriah Bilenky and Jean Yost, for their hard work. Thanks also to student interns, Azucena (Suzie) Castillo and Sam Blair, student workers Eric

Hall-Floden, Taylor Mauch, and all other student workers for the excellent job they did this past season.

Horticulture Research Station staff would like to thank Rimol Greenhouse Systems for their generous contribution of a rolling high tunnel.

Table 1. Horticulture Research Station, Ames, monthly rainfall and average temperatures for 2019.

Month	Rainfall (in.)			Temperature (°F)			Days 90° or above
	2019	Deviation from normal	High 2019	Deviation from normal	Low 2019	Deviation from normal	
March	1.13	-0.87	40.4	-8.2	21.9	-6.5	0
April	2.35	-1.55	62.6	-0.8	38.2	-1.5	0
May	7.10	+2.40	68.5	-6.3	48.1	-4.2	1
June	3.69	-0.81	79.8	-3.9	61.3	-1.2	3
July	3.34	-0.56	86.1	-0.3	64.9	-1.1	7
August	1.59	-3.41	81.3	-3.1	59.2	+3.8	0
September	6.03	+2.83	80.2	+1.2	58.8	-3.8	0
October	<u>5.60</u>	<u>+3.20</u>	57.1	-8.0	36.0	-6.2	<u>0</u>
Total	30.83	+1.23					11

<u>Project</u>	<u>Project Leader</u>
Soybean line expansion	G. Beattie
Brussels sprouts production project	B. Carpenter
Garlic mulch study	B. Carpenter
Gourd production project	B. Carpenter
Mini tunnel flower production project	B. Carpenter
Mini tunnel vegetable production project	B. Carpenter
Onion production project	B. Carpenter
Pepper production internship	B. Carpenter
Pumpkin production project	B. Carpenter
Student high tunnel tomato production	B. Carpenter
Creeping bentgrass fairway height	N. Christians
Creeping bentgrass green height	N. Christians
Creeping bentgrass plug recovery study	N. Christians
Creeping bentgrass divot recovery study	N. Christians
Kentucky bluegrass divot recovery study	N. Christians
Kentucky bluegrass full sun	N. Christians
Kentucky bluegrass plug recovery study	N. Christians
Ornamental grass demonstration plots	N. Christians
Perennial ryegrass full sun	N. Christians
Hardy peach trial	D. Cochran
Hardy/disease resistance pear trial	D. Cochran
Herbicide study	D. Cochran
High tunnel peach study	D. Cochran
Hops cultivar study	D. Cochran
Hops moisture and plant nutrition study	D. Cochran
NC140 apple study	D. Cochran
NE1020 wine grape trial	D. Cochran
Student orchard	D. Cochran
Plant growth regulator field study	C. Curry
Organic mulch evaluation study	M. Gleason
Organic pollination study	M. Gleason
Redbud breeding trial	W. Graves
Weed study	R. Hartzler
Home demonstration garden	C. Haynes
Food production internship project	N. Howell

Project – continued**Project Leader**

Ash pollination study	J. Iles
Flowering crab trial	J. Iles
Shade tree trial	J. Iles
Tree Swallow nesting	R. Klaver
Turfgrass cover crop study	A. Lenssen
Soybean quality increase project	D. Mueller
Biodegradable plastic mulch study	A. Nair
Broccoli row cover study	A. Nair
High tunnel melon study	A. Nair
Organic cover crop study	A. Nair
Sweet potato study	A. Nair
Vegetable/chicken production project	A. Nair
Pythium corn study	S. Navi
Pythium field pea study	S. Navi
Pythium spinach study	S. Navi
Post-emergent crabgrass control trial	B. Pease
AgP2P sales/inventory management app	A. Plastina
PPO soy effects on seedling disease pressure	A. Robertson
Rye cover crop effects of corn stand and ear development	A. Robertson
Soybean seed treatment study	A. Robertson
La Crescent styles aromas study	J. Savits
La Crescent styles co-inoculation	J. Savits
La Crescent styles cryo extraction	J. Savits
La Crescent styles neutral barrel fermentation study	J. Savits
Marquette berry protein analysis	J. Savits
Christmas bird count	B. Stewart
Good Earth Student Farm	Student Leaders
Perennial CRF study	G. Thompson
Effect of leaf cell size on Kentucky bluegrass traffic tolerance	A. Thoms
Extended fertility release trial	A. Thoms
Fall herbicide timing and product trial	A. Thoms

Project – continued**Project Leader**

Humic acid fertilizer trial under traffic	A. Thoms
Hybrid turfgrass system trial	A. Thoms
Kentucky bluegrass shade NTEP trial	A. Thoms
NCERA multi-state organic weed control trial	A. Thoms
Physiological responses of Kentucky bluegrass to simulated athletic field traffic	A. Thoms
Soil fertility and soil health trial	A. Thoms
Tall fescue shade NTEP trial	A. Thoms
Tall fescue traffic NTEP trial	A. Thoms
USGA putting green fertility and soil health trial	A. Thoms
USGA putting green hollow tine aerification recycling trial	A. Thoms
Wastewater algae fertilizer pellet trial	A. Thoms
Bee stock hives	A. Toth
Wasp study	A. Toth
Fish overwintering study	M. Weber
Aquatic nutrient load study	G. Wilkinson
Lake mapping project	G. Wilkinson
