Horticulture Research Station Summary

RFR-A1825

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. Chad Arnold, agriculture specialist, joined the station staff in July. His primary responsibilities are bulk crop production and maintenance of equipment and facilities. Chad is a great addition to the staff. Jean Yost also joined the staff in 2018 as a graduate assistant from Atlanta, Georgia, working on hydroponics greenhouse research. Moriah Bilenky continues as graduate assistant working on vegetable production techniques.

Students. This season three students completed internships. Truman Brady, senior, agronomy/horticulture, completed the student internship managing food production enterprise from planting to harvest. This includes choosing and growing crops and marketing them on the station's FoodLo.cals website. Truman grew a diverse variety of vegetables including several tomato and pepper varieties, kale, eggplant, okra, kohlrabi, cabbage, carrots, and several other vegetable crops. Michaela Jenkins, senior, English, grew a green bell pepper crop contracted by Campus Dining Services. This field was a half-acre in size and yielded 7,000 lb of peppers. Michaela had the opportunity to learn how to grow a vegetable crop on a large scale. Eric Hall-Floden, sophomore, horticulture, completed an internship in high tunnel production of colored peppers and cucumbers.

Research. The Horticulture Station's main function continues to be research. With 80 projects and 22 investigators involved, the range of projects is diverse. Hops, apples, grapes, tomatoes, peppers, garlic, squash, melons, and soybeans were grown for research. Ornamental crops, such as turfgrass, shade trees, and flowering crabs, also were used for research purposes. Projects involving bees, wasps, and tree swallows added more research diversity.

One significant Ph.D level project under Ajay Nair–colored pepper production project in high tunnels–was finished. This project looked at the effect of three levels of shade on colored peppers. Nair's high tunnel tomato grafting project to control soilborne diseases was completed. Nair began a new project in 2018 looking at fertility rates in sweet potato production.

Diana Cochran's hops research continued. This research looks at water and fertilizer requirements for hops production, in addition to work on a hops cultivar selection trial.

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

Landscape and infrastructure. In 2018, the new 10-acre prairie was spectacular, demonstrating a new level of maturity. This area contains a remnant oak/hickory savanna with the 14th largest Burr oak in Iowa, which is estimated to be over 300 years old. The prairie was cleared of non-native invasive woody plants in 2010. In 2015, the herbaceous vegetation was killed and then seeded with a diverse prairie seed mix. In its third season, the prairie forbs formed waves of color across the prairie and the plant species showed evidence of segregating themselves to the areas where they are best suited for survival. The prairie project is part of the national Monarch butterfly habitat improvement project and was funded by the Iowa Monarch Conservation Consortium. It will not only benefit the Monarch butterfly but also provide many other benefits of a diverse prairie.

The station's 15 ash trees were treated in 2018 for the impending infection of the Emerald Ash Borer. Thanks to the generous donations of equipment and pesticides from representatives of SiteOne Landscape supply and Arborjet, we were able to make the first treatment and received a pledge of future treatments. These mature trees are an important part of the landscape and the treatments should insure their survival.

Several infrastructure improvements were completed in 2018. The shop's original roof was removed, the ceiling reinsulated, and a new roof installed. The pump station was insulated so the irrigation system can run later in the season. A new electrical service was installed in the high tunnel field. This upgrade will make the power supply more reliable and allow for the addition of new tunnels in the future. The largest infrastructure project was the renovation of the Aquatic Research Facility. These six ponds, built in 2005, were originally constructed to do fish production research projects. They were mothballed when funding ended in 2013. When attempting to bring the ponds back into use in 2016, they leaked making them unusable. To remedy the situation, 90 tons of bentonite was applied and incorporated into the six pond basins and they were refilled with water. With the ponds now repaired, research will focus on natural aquatic ecosystems.

Industry and the public. The research station hosted five field days for people interested in vegetable and fruit production, hops, turfgrass, cover crops, general home gardening, and bees and pollinators in 2018. The most notable field day was the Iowa Public Radio's Horticulture Day at the Station. This included tours of the farm, apple sorter demonstrations, children's games, and a farmer's market. A special program led by radio personality Charity Nebbe provided the audience the opportunity to ask related questions to the ISU horticulture experts. Despite rain and cool temperatures, 200 people attended.

In addition to the field days, the farm hosted 19 tours and five other events and meetings for the public. More than 1,200 people visited the station in 2018.

Weather Comments

Winter 2017-2018. From December 2017 through February 2018, below normal high and low temperatures delayed the pruning of orchards and vineyards. No bud damage occurred in early spring. Late winter precipitation was above normal.

Spring 2018. A slow warm-up brought the apples and grapes out of dormancy about two weeks later than normal. Precipitation was below normal in April and May, allowing timely planting of annual vegetable crops. Cooler than normal highs and lows in March and April and above normal highs and lows in May were experienced.

Summer 2018. Hot conditions in June reduced the effectiveness of chemical apple thinner resulting in an over-cropping of the apple orchards. This coupled with a dry period in July resulted in an excessive amount of small fruit produced in the orchards.

Fall 2018. Above normal precipitation and below normal high and low temperatures resulted in a delay in root and bulk crop harvest. Apple and other vegetable crop harvests were unaffected by weather conditions.

Acknowledgements

I would like to thank the farm crew Brandon Carpenter, Chad Arnold, Lynn Schroeder, Jeff Braland, and Ben Pease, and graduate students Moriah Bilenky and Jean Yost for their hard work. Thanks also to student interns Truman Brady, Michaela Jenkins, and Eric Hall-Floden and student workers Ben Fox, Taylor Mauch and all other student workers for the excellent job they did this past season.

Horticulture Research Station staff would like to thank both the Horticulture and Turf Clubs for their help with preparation and participation in the NPR field day. Their assistance helped make the day a success.

Table 1. Horticulture Research Station, Ames, monthly rainfall and average temperatures for 2018.

	Rainfall (in.)		Temperature (ºF)				Days
Month	2018	Deviation from normal	High 2018	Deviation from normal	Low 2018	Deviation from normal	90º or above
March	2.74	+0.74	43.4	-5.5	26.2	-2.4	0
April	1.77	-2.13	52.3	-11.6	28.5	-11.6	0
May	3.57	-1.13	79.9	+5.2	56.6	+4.4	5
June	9.24	+4.94	84.4	+0.7	63.7	+1.3	8
July	3.03	-0.87	83.5	-3.0	63.0	-3.1	5
August	7.87	+2.77	81.5	-2.9	62.7	-1.0	1
September	6.11	+3.01	76.4	-2.5	53.3	+1.5	3
October	4.19	+1.89	59.7	-5.5	37.7	-4.4	0
Total	38.52	+9.22					22

Project	Project Leader
Transgenic soybean project	M. Bhattacharyya
Brussels sprouts topping study	B. Carpenter
High tunnel pepper production internship	B. Carpenter
Onion production project	B. Carpenter
Pepper production internship	B. Carpenter
Pumpkin production project	B. Carpenter
Anuvia fertilizer trial	N. Christians
Branch chain amino acid trial	N. Christians
Broadleaf weed control with natural products.	N. Christians
Effect of soy byproduct on grass recovery trial 1	N. Christians
Effect of soy byproduct on grass recovery trial 2	N. Christians
Effect of soy byproduct on grass recovery trial 3	N. Christians
Effect of soy byproduct on grass recovery trial 4	N. Christians
Fairway height creeping bentgrass trial	N. Christians
Green height creeping bentgrass trial	N. Christians
Kentucky bluegrass trial-full sun	N. Christians
Ornamental grass trial	N. Christians
Perennial ryegrass trial	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
NE1020 wine grape trial	D. Cochran
Student orchard	D. Cochran
Organic transition mulch study	M. Gleason
Organic transition row cover study	M. Gleason
Strawberry disease study	M. Gleason
Redbud breeding trial	W. Graves
Weed study	R. Hartzler
Home demonstration pollinator garden	C. Haynes
Master gardener food pantry study	C. Haynes
Milkweed demonstration	R. Hellmich

Project (continued)	**Project Leader**
Artichoke over wintering study	N. Howell
Certified organic land project	N. Howell
Food production internship project	N. Howell
Ash pollination study	J. Iles
Flowering crab trial	J. Iles
Shade tree trial	J. Iles
Tree Swallow nesting	R. Klaver
Perennial cover crop systems for maize grain and biomass production	A. Lenssen
Broccoli row cover study	A. Nair
High tunnel fall crop succession planting	A. Nair
High tunnel tomato grafting	A. Nair
Integration of cover crop, vegetable and poultry production for sustainable cropping systems	A. Nair
Mini-tunnel pepper trial	A. Nair
Potato study succession planting study	A. Nair
Sweet potato fertility study	A. Nair
Pythium spinach study	S. Navi
Fine root study on woody ornamentals	J. Randall
Missouri gravel bed tree rooting study	J. Randall
Woody plant transplant study	J. Randall
Corn cover crop study	A. Robertson
Soybean herbicide project	A. Robertson
Soybean breeding project	A. Singh
Row cover project	B. Steward
Christmas bird count	T. Stewart
Good Earth Student Farm	Student leaders
Aeration fertilization recovery trial	A. Thoms
Athletic field wetting agent rate and product trial	A. Thoms
Fall timing of GameOn and Relzar herbicide testing trial	A. Thoms
Fertility product rate and timing trial	A. Thoms
Fiesta timing and rate weed control trial	A. Thoms
Hybrid turfgrass testing trial	A. Thoms

Project (continued)	**Project Leader**
Kentucky bluegrass NTEP shade trial	A. Thoms
Natural fertility product and rate timing trial	A. Thoms
NCERA-221 organic turfgrass weed control trial	A. Thoms
Physiological responses of Kentucky bluegrass to simulated athletic field traffic	A. Thoms
Putting green rootzone recycling trial	A. Thoms
Shockwave aeration performance trial	A. Thoms
Sure Power herbicide testing trial	A. Thoms
Tall fescue mowing height performance trial under simulated traffic	A. Thoms
Tall fescue NTEP shade trial	A. Thoms
Tall fescue NTEP traffic trial	A. Thoms
Bee nursery	A. Toth
Fish overwintering study	M. Weber
Lake mapping project	G. Wilkinson
Water pollution study	G. Wilkinson