

Horticulture Research Station Summary

RFR-A1704

Station Staff

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

Associate Dean for Operations Mark Honeyman
 Farms Manager Tim Goode
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Horticulture Research Station
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Location: Three miles north of Ames on Highway 69,
 turn east on 170th Street about 1½ miles.

Station and Weather Summary

Nick Howell, station superintendent

Station Comments

Staffing. Ben Pease, Madison, Wisconsin, joined our team in February 2017 as turfgrass research associate. John Critser, graduate student working in grape research, resigned his position in July 2017. We are actively recruiting a new master's student to fill that position. Moriah Bilenky continues work on her master's degree in vegetable production techniques.

Students. This season two students completed internships. Eli Samo, horticulture sophomore, managed planting, care, and maintenance of the Home Demonstration Garden. The garden produces vegetables for local food pantries. Eli also managed master gardener volunteers by providing training and assistance in the harvesting and sanitation of the crops grown in the garden. At the end of the season, 2,400 lb of produce was harvested. The second intern, Ben Fox, horticulture senior, was responsible for the construction of a high tunnel. The tunnel was moved to the Horticulture Station from the ISU Armstrong Farm, Lewis, Iowa, and will be used to grow produce for the student production internship.

Research. The Horticulture Station's main function continues to be research. With 65 projects and 22 investigators involved, the range of projects is diverse. Hops, apples, grapes, tomatoes, peppers, garlic, squash, and melons were grown. Ornamental crops, such as turfgrass, shade trees, and flowering crabs, also were used for research purposes, and soybean trials were conducted. Projects involving bees, wasps, and tree swallows added more diversity.

A significant new Ph.D grad student level project under Ajay Nair began in 2017. This

study involved growing colored peppers in high tunnels under different levels of shade to prevent sunscald in hot Iowa summers. In order for this project to be properly replicated, three additional 15 ft x 30 ft high tunnel structures were constructed. Additional high tunnel research was conducted in a 36 ft x 90 ft tunnel. This project involved looking at the effects of tomato grafting to control soil-borne diseases. Research using cover crops continued. A cereal rye cultivar study and a study growing garlic using cover crops were completed in 2017.

Diana Cochran's hops research continued in 2017. This research looks at water and fertilizer requirements for hop production. The hop cultivar selection trial continued.

In turfgrass, Adam Thoms' first year of research focused on products and practices for athlete safety on athletic fields. The effects of products and cultural practices under simulated player compaction on athletic fields was examined.

Landscape and infrastructure. The new prairie made major strides in its establishment. Seeded in the fall of 2015, 10 acres of prairie was added below the dam of Horticulture Lake. This area, with its remnant oak/hickory savanna, was cleared of non-native and invasive woody plants in 2010. In 2015, the herbaceous vegetation was killed and seeded with a diverse prairie seed mix. In its second season, the prairie forbs were the predominant plant type to establish and it was extremely colorful all season long. Mark Rouw, big tree expert, documented the size of the ancient Burr oak. After measuring, it was found the tree is the 14th largest Burr oak in the state of Iowa and estimated to be over 300 years old. The prairie project is a part of the national Monarch butterfly habitat improvement

project and will not only benefit the Monarch butterfly but also provide the many other benefits of a diverse prairie.

After several years of removal of dead and dying landscape trees, replanting began in 2017. Five Heritage oaks and 10 White oaks were planted. The lilac hedge along the west edge of the front lawn was removed and a new red twig dogwood hedge was planted.

The apple sorter received significant improvements. The wooden 1940s era eliminator and conveyors were replaced with modern equipment. These improvements with the addition of a dunk tank in 2016 make it possible for the apples to be sanitized as part of the sorting and sizing process. A produce washer was added to the station's equipment inventory. Capable of washing and sanitizing a wide range of produce, a significant savings in labor processing fruit and vegetables for market has been achieved.

Industry and the public. The research station hosted five field days for people interested in vegetable and fruit production, hops, turfgrass, cover crops, and general home gardening. The most notable field day was the Horticulture Research Station's 50th anniversary celebration. This included tours of the station, apple sorter demonstrations, kid's games, and a farmer's market. A special presentation by Endowed Dean of the College of Agriculture and Life Sciences, now ISU President Wendy Wintersteen, and Horticulture chair Jeff Iles, acknowledged the years of important accomplishments that occurred and recognized all those who work at the station. A special recognition of the families of the former superintendents was given by Jeff Iles. The program ended with special guest Charity Nebbe, Iowa Public Radio, interviewing farm researchers about their work and their impressions of the station. Over 300 people attended the 50th anniversary celebration.

In addition to the field days, the station hosted 19 tours and eight other events and meetings for the industry and public. By the end of the season, more than 1,200 people visited the station.

Weather Comments

Winter 2016-2017. From December 2016 through February 2017, above normal high and low temperatures allowed early completion of pruning orchards and vineyards. Little bud damage occurred in early spring. Late winter precipitation was above normal.

Spring 2017. A late-season freeze caused considerable crop loss in the Chieftain apples. Precipitation was only slightly above normal in April and May, allowing timely planting of annual vegetable crops. Relatively normal high and low temperatures were experienced throughout the spring.

Summer 2017. Precipitation was below normal in June, July, and August requiring extensive irrigation for fruit, vegetable, and turfgrass research. Above normal heat made irrigation even more critical. Weather conditions were ideal for cucumber beetle infestations and significant damage was seen on watermelon and pumpkin crops.

Fall 2017. Drought conditions and above normal temperatures continued into fall, requiring irrigation in November for turfgrass research. At the end of the season, 6.7 million gallons were pumped for irrigation. Combined pumping and loss to evaporation brought Horticulture Lake water levels to 18 in. below normal.

Acknowledgements

I would like to thank the station crew Brandon Carpenter, Lynn Schroeder, Jeff Braland, and Ben Pease, and graduate student Moriah Bilenky for their hard work. Thanks also to student interns Eli Samo and Ben Fox, and

student workers Michaela Jenkins, Rachel Tan, Amanda VanScoy, and all other student workers for the excellent job they did this past season.

Nebbe, Tim Vanloo, and the Horticulture and Turf Clubs for their help with preparation and managing the Horticulture Research Station's 50th anniversary celebration. Their assistance helped make the day special.

Horticulture Research Station staff would like to thank Adam Thoms, Barb Clawson, Charity

Table 1. Horticulture Research Station, Ames, monthly rainfall and average temperatures for 2017.

Month	Rainfall (in.)		High 2017	Temperature (°F)		Days 90° or above	
	2017	Deviation from normal		Deviation from normal	Low 2017		Deviation from normal
March	3.15	+1.25	45.9	-1.5	27.9	+0.2	0
April	4.02	+0.20	61.8	-0.2	42.1	+3.4	0
May	5.23	+0.60	72.3	0.0	50.1	-0.5	0
June	2.99	-1.37	84.5	+3.7	59.3	-1.1	5
July	3.31	-0.47	86.9	+3.2	63.9	-0.1	9
August	2.44	-2.38	81.0	-0.5	56.6	-5.1	1
September	1.94	-1.07	81.5	+5.3	55.2	+2.2	6
October	<u>6.10</u>	<u>-3.83</u>	63.5	+0.4	43.2	+2.3	<u>0</u>
Total	29.18	-7.07					21

Project**Project Leader**

Butterfly tracking project	S. Bradbury
Brussels sprouts production project	B. Carpenter
Pepper production project	B. Carpenter
Pumpkin production project	B. Carpenter
Watermelon production project	B. Carpenter
Ornamental grass demonstration	N. Christians
Anuvia fertilizer trial	N. Christians
Kentucky bluegrass NTEP trial "Full Sun"	N. Christians
Natural herbicide trial	N. Christians
Perennial ryegrass NTEP trial	N. Christians
Tall fescue NTEP trial	N. Christians
Branched-chain amino acids on creeping bentgrass shoot density	N. Christians/I. Mertz
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 rootstock trial	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
Row cover removal project	M. Hanna
Home demonstration pollinator garden	C. Haynes
Master gardener food pantry study	C. Haynes
Milkweed demonstration	R. Hellmich
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
Christmas bird count	R. Klaver

Project (continued)**Project Leader**

Tree swallow nesting	R. Klaver
Perennial cover crop systems for maize and biomass	A. Lenssen
Cover crops garlic 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	A. Nair
Lettuce breeding project	A. Nair
Mini-tunnel pepper trial	A. Nair
Rye cultivar evaluation	A. Nair
Fine root study on woody ornamentals	J. Randall
Missouri gravel bed tree rooting study	J. Randall
Woody plant transplant study	J. Randall
Soybean breeding project	A. Singh
Good Earth student farm	Student Leaders
Robotic weeder imaging study	L. Tang
Cold-hardy bermudagrass cultivar trial under simulated traffic	A. Thoms
Athletic field cultivation methods	A. Thoms
Evaluation of corn gluten meal under simulated athletic field traffic	A. Thoms
Evaluation of tall fescue cutting height for athletic fields	A. Thoms
Golf course putting green organic matter recycling trial	A. Thoms
In-season wetting agent trial on athletic fields	A. Thoms
Kentucky bluegrass NTEP shade evaluation trial	A. Thoms
Lawn establishment timing by species study	A. Thoms
Season-long wetting agent trial on athletic fields	A. Thoms
Prairie effect on honey bee health	A. Toth
Characterizing pollen forage resources for honey bees on farms vs. prairies	A. Toth
Effects of virus infection on honey bee behavior	A. Toth
Nutritional depletion and social cohesion in honey bee colonies	A. Toth
Lake mapping project	G. Wilkinson