Horticulture Research Station Summary

RFR-A1608

Farm Staff

Superintendent ..... Nick Howell
Agricultural Specialist ..... Brandon Carpenter
Field Lab Technician ..... Lynn Schroeder
Equipment Operator ..... Jeff Braland
Turfgrass Research Associate ..... Dan Strey (resigned June 2016)
Turfgrass Research Associate ..... Ben Pease (begins February 2017)

Research Farms Coordinator ..... 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. Dan Strey, research associate in turfgrass, took a position managing the turfgrass of the playing field at the Los Angeles Memorial Coliseum, home of the U.S.C. Trojans and L.A. Rams. The Horticulture Station thanks him for all his good work and wishes him the best. Ben Pease from Madison, Wisconsin, will join the staff as turfgrass research associate in February 2017.

The Horticulture Station recruited two graduate students in 2016. Moriah Bilenky, class of 2013, returned from Pennsylvania to pursue her master's degree. She will be studying vegetable production techniques using chickens and working with Dr. Ajay Nair. John Critser, Auburn class of 2016, moved from Alabama to study grape production techniques to reduce vigor and increase production. He is working with Dr. Diana Cochran.

Students in these assistantships work full-time as staff at the Horticulture Station during the late spring and summer months and attend classes during fall and spring semesters.

Students. This season two students completed internships. Elena Ingram, junior, worked on herb production and was responsible for final data collection of a long-running blackberry trellis study. Thabisa Mazur, junior, worked on developing our local foods enterprise. Beginning in January, she developed a field plan consisting of potential crops based on available markets, planting schedules, and production protocols for each crop. As the season progressed, she grew crops in the greenhouse, laid out the field, and planted the field. Throughout the season she managed field production, and as harvest began, she marketed each crop on the Horticulture Research Station Community Produce website, the Knoll, and to ISU Dining. The plan for next season is to expand this internship to include two qualified undergraduate students.

Research. The Horticulture Station's main function continues to be research. With 85 projects and 22 investigators involved, the range of projects is diverse. Hops, apples, grapes, tomatoes, peppers, pak choi, garlic, squash, and melons were grown for research. Ornamental crops, such as turfgrass, shade trees, and flowering crabs, also were used for research purposes. Also, soybean trials were conducted. Projects involving turtles, bees, wasps, and tree swallows added more research diversity.

A new project was the addition of two rows to the hops yard. The additional rows are new hops plant cultivars studied for their appropriateness for production in Iowa. Another new project was a high tunnel peach production trial. A new 42 ft x 96 ft x 19 ft tall high tunnel was constructed and planted with peach trees to test its potential benefits to hardiness of peach production in Iowa. This new tunnel is now the largest at the station. The use of cover crops in vegetable production also was studied. Specifically, this project looked at the effects of annual rye on the prevention of Listeria contamination on cantaloupe. In addition, garlic production using cover crops was studied. In the small tunnels, the effects of different levels of shade on colored peppers was tested, and in another tunnel, tomato grafting to control soil-borne diseases was examined.

Landscape and infrastructure. The new prairie seeding made major strides in establishment in 2016. 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 four years ago. In 2015, the herbaceous vegetation was killed during the spring and summer and it was seeded with a diverse prairie seed mix in the fall. This project, which is part of a national Monarch butterfly habitat improvement project, will benefit pollinators and provide many other benefits of a diverse prairie.

Approximately 230 apple trees were removed. These trees were the last of the conventional semi-dwarf orchards and were in decline. New trellis system orchards have been planted over the last several years in anticipation of the removal of the old orchard. The new orchards require significantly less maintenance and produce higher quality fruit, making them a more practical apple growing system for Iowa.

Improvements to the farm irrigation system continued in 2016. An addition was made connecting the mainline to the new peach high tunnel. A more sophisticated trickle and filtration system was added to the hops yard, allowing increased capacity for research treatments.

Industry and the public. The public had a strong presence at the station in 2016. The research station hosted 11 field days for people interested in vegetable and fruit production, hops, turfgrass and turf equipment, air blast sprayer calibration, soils, forestry, and general home gardening. One notable field day was sponsored by Iowa Public Radio. In celebration of the 25th anniversary of the Horticulture Day radio program, Iowa Public Radio held an open house at the station, with 400 people attending. The day included tours of the research plots and a program featuring the experts from the show sharing their experiences. In addition to the field days, the farm hosted 23 tours and six other events and meetings for the public. By the end of the season, over 2,000 people visited the station.

Weather Comments

Winter 2015-2016. From December 2015 through February 2016, colder-than-normal temperatures caused a delay of pruning orchards and vineyards. Little bud damage occurred due to a slow warm-up in early spring. Precipitation was below normal throughout the winter.

Spring 2016. A late-season freeze caused concern for the apples and grapes, but bud set was normal. Precipitation was below normal in May and June, allowing timely planting of annual vegetable crops. Below normal high and low temperatures were experienced throughout the spring.

Summer 2016. Precipitation was below normal in June and well above normal in July and August. A 10-minute hailstorm in July caused damage to the apple crop. There was up to 90 percent crop loss in some areas of the orchards. Weather conditions were ideal for cucumber beetle infestations. Weekly organic pesticide applications were required to keep ahead of infestations on the organic melon crops.
Fall 2016. Heavier than normal rainfall in August could have caused significant damage to the grape crop, but a change in harvest procedures allowed for a good harvest. A long dry period from mid-September through October made for an easy apple harvest season.

Acknowledgements

I would like to thank the farm crew Brandon Carpenter, Lynn Schroeder, Jeff Braland, and Dan Strey, and graduate students Moriah Bilenky and John Critser, for their hard work. Thanks also to student interns Thabisa Mazur and Elena Ingram, and student workers Riley Madole, Rachel Sporer, and all other student workers for the excellent job this past season.

Table 1. Horticulture Research Station, Ames, monthly rainfall and average temperatures for 2016.

	Rainfall (in.)		Temperature (ºF)				Days
Month	2016	Deviation from normal	High 2016	Deviation from normal	Low 2016	Deviation from normal	90º or above
March	2.26	+0.26	53.6	+4.6	32.5	+3.8	0
April	3.14	-0.76	61.8	-2.4	40.3	+0.2	0
May	3.67	-1.03	72.2	-2.8	48.2	-4.1	0
June	1.04	-3.46	86.8	+3.3	62.1	-0.2	7
July	6.79	+2.99	84.0	-2.5	63.3	-2.8	6
August	9.95	+4.95	83.4	-0.8	62.3	-1.2	1
September	7.39	+4.19	79.4	+0.7	57.0	+2.2	1
October	0.75	-1.65	58.7	-6.8	35.3	-7.0	0
Total	34.99	+5.49					15

Research Station Projects

Project	Project Leader
Bat monitoring project	J. Blanchong
Corn stover mulch study	B. Carpenter
Potato production	B. Carpenter
Sweet potato production	B. Carpenter
Apple sanitation water bath	B. Carpenter/J. Hartley
Student intern herb production study	B. Carpenter/E. Ingram
NTEP fairway height creeping bentgrass	N. Christians
NTEP green height creeping bentgrass	N. Christians
NTEP Kentucky bluegrass trial	N. Christians
NTEP perennial ryegrass trial	N. Christians
NTEP tall fescue trial	N. Christians
Pick seed tall fescue trial	N. Christians
Poa annua control study	N. Christians
Grape growth regulator study	D. Cochran
Grape mulch study	D. Cochran
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
Northern grape study	D. Cochran
Student orchard	D. Cochran
Vineyard weather station installation	D. Cochran
Organic transition mulch study	M. Gleason
Organic transition row cover study	M. Gleason
SBFS warning system evaluation	M. Gleason
SBFS wetness ecology project	M. Gleason
Alder hardiness study	W. Graves
Bio plastic degradation study	W. Graves
Bio plastic nutrition study	W. Graves
Redbud breeding trial	W. Graves
Row cover removal equipment test	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
Research strawberry field establishment	N. Howell
Student intern production project	N. Howell/T. Mazur
Ash pollination study	J. Iles

Project (continued)	**Project Leader**
Flowering crab trial	J. Iles
Shade tree trial	J. Iles
Environmental DNA in freshwater turtles	F. Janzen
How differing sex ratios affect turtle nesting behavior	F. Janzen
Christmas bird count	R. Klaver
Tree Swallow nesting	R. Klaver
Soybean SDS study	D. Mueller
Cover crop demo	A. Nair
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
Melon Listeria project	A. Nair
Mini tunnel pepper trial	A. Nair
Rye variety timing trial	A. Nair
Blackberry training study	G. Nonnecke
Grape nursery	G. Nonnecke
Pollinator project	M. O'Neal
Soybean pollinator study	M. O'Neal
Fine root study on woody ornamentals	J. Randall
Missouri gravel bed tree rooting study	J. Randall
Woody plant transplant study	J. Randall
Student organic farm	Student leaders
Robotic weeder imaging study	L. Tang
Athletic field fertility, species and safety study	A. Thoms
Bagging vs. mulching what works	A. Thoms
Bermudagrass cold hardiness study	A. Thoms
Can plant growth regulators control rough bluegrass	A. Thoms
Golf course fairway organic matter management with fraze mowing	A. Thoms
Golf course putting green organic matter recycling study	A. Thoms
Lawn establishment timing by species study	A. Thoms
Weed control on athletic fields	A. Thoms
Personalities of paper wasps and their colonies	A. Toth
Nutrition and virus titers of honey bees	A. Toth
Role of the gene Vitellogenin in wasp sociality	A. Toth
Transplanting bee hives to prairies	A. Toth
Effects of ag intensification on honey bee hive health	A. Toth
Nutritional stress effects on honey bee queens	A. Toth
Effects of honey bee viruses on social behavior	A. Toth
Flowering phenology of clover in agricultural field edges	A. Toth
Prey foraging by paper wasps as Brassica biocontrol	A. Toth
Seasonal variation on the nutritional value of pollen	A. Toth