Horticulture Research Station Summary

RFR-A1353

Farm Staff

Superintendent ..... Nick Howell
Operations Manager ..... Jim Kubik
Field Lab Technician ..... Lynn Schroeder
Equipment Operator ..... Jeff Braland
Turfgrass Research Associate ..... Dan Strey
Graduate Assistant ..... Brandon Carpenter
Graduate Assistant ..... Leah Riesselman

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. There were no changes in farm staffing in 2013. Dan Strey, research associate in turfgrass, continued managing turfgrass research. Brandon Carpenter and Leah Riesselman continued as graduate assistants. Brandon and Leah work for the station full-time during the growing season and attend classes during the spring and fall semesters. The graduate assistantships are funded by the Research Farms and are a new model for farm staffing. Brandon and Leah will be completing their master's program in the spring of 2014. Also continuing in their positions are Jim Kubik, operations manager; Lynn Schroeder, field lab tech; and Jeff Braland, equipment operator.

Internships. In an effort to expand student academic experiences beyond ISU, the Horticulture Station and Global Agriculture Programs developed a new internship opportunity geared to international students wanting to come to the United States to study horticulture. Promoted through the student organization International Association of Students in Agriculture and Related Sciences (IAAS), Jasper Depotter, the first intern in this program, came from Belgium in July to work at the station. Over a five-week period, he worked a rotation of four horticultural disciplines including turfgrass, ornamentals, and fruit/vegetable production. In this process, Jasper was exposed to horticulture research and had the opportunity to learn about life at ISU and in Iowa. Also, the station student employees benefited from the opportunity of working with a fellow student from another culture.

This year, six additional internship opportunities were offered to ISU horticulture students. Adam Grimm, senior, worked on prairie oak savanna restoration. Jesse Worth, senior, worked on blackberry training systems. Brad Bathey, junior, worked with high tunnel management. Jacob Graber, junior, worked with vineyard management techniques. Cory Rigler, junior, assisted with honeybee research. Taylor Goetzinger, senior, managed the Home Demonstration Garden. These students did an exceptional job. The Horticulture Station is proud of them and their accomplishments. It is our hope they will have continued success in their careers.

Research. The Horticulture Station's main function continues to be research. With more than 90 projects and 26 faculty members involved, the range of projects is diverse. Apples, strawberries, grapes, tomatoes, peppers, cucumbers, sweet potatoes, and melons were grown for research. Ornamental crops, such as turfgrass, shade trees, flowering crabs, roses, and Hydrangea also were used for research purposes. In addition to the horticultural crops, projects using prairie plants and soybeans were conducted. Projects involving turtles, tree swallows, and mosquitoes added more research diversity.

Landscape and infrastructure. The landscape of the station has again seen dramatic improvements in 2013. All areas below Horticulture Lake dam south to the old farmstead were cleared of nonnative brush. This 15-acre site has a remnant oak savanna, which contains a native Burr Oak tree that predates the American Revolution. The 'TREE' as it is affectionately known by station staff, will become a feature specimen in a restored prairie/oak savanna to be installed over the next several years. The new prairie and savanna will be a teaching tool for ISU students and provide research opportunities for horticulture projects looking

at the effects of beneficial insects on horticulture crops.

Improvements in the farm irrigation system continued in 2013. With two seasons of significant drought, lake water management has become a crucial component of the farm's irrigation practices. The installation of a computer-operated central control system for the in-ground irrigation system at turf research has reduced their water consumption by 25 percent. This equates to a savings of nearly one million gallons of water.

Improvements also were made on the farm coolers in 2013. Four of the eight coolers received new mechanical systems making them more dependable and efficient. One of these coolers also has the ability to heat, in order to cure crops like sweet potatoes and winter squash for long-term storage. Work on the remaining coolers will continue in 2014.

Significant remodeling of the farm residence occurred in 2013. This project included a new bathroom and kitchen and all interior paint. With the work complete, a permanent farm staff member moved in and the station now has a weekend manager to handle issues that occur after regular farm hours.

Industry and the public. The public had a strong presence at the station in 2013. The research station hosted six field days for people interested in cover crops, vegetable production, turfgrass, and general home gardening. One field day was geared to high school freshmen. This event, called Ag Leadership Day, gave 200 high school freshmen from all over Iowa the opportunity to learn about landscape design, tree pruning, turf management, and fruit/vegetable production. Students interested in agronomy learned about soil and forage judging, and students interested in biology learned about turtles and bees. In addition to the field days, the farm hosted 25 tours and eight other events and meetings for the public. At the end of the season, over 1,500 people had visited the station.

Weather Comments

Winter 2012-2013. Lower than normal high and low temps allowed normal dormancy periods for perennial crops. Precipitation was normal to slightly above normal during the period. A 1.5 in. rain event on frozen ground in March brought Horticulture Lake up 3.5 ft to a normal level.

Spring 2013. Above normal rainfall and below normal high and low temps caused a significant delay in vegetable and bulk crop planting with most planting occurring in June. Nearly half of the season rainfall occurred in April and May.

Summer 2013. The Horticulture Station experienced a flash drought during the summer of 2013 with precipitation being 7.25 in. below normal. Cooler than normal temperatures and irrigation offset potential damage to horticulture crops from the drought.

Fall 2013. Cooler than normal temps and drought conditions continued into the fall, leading to an extended harvest in 2013. A record apple harvest of 64 tons was harvested in 2013. This was 24 tons above a normal harvest and was partially a result of a crop failure in 2012.

Acknowledgements

I would like to thank Brandon Carpenter, grad student, and Steve Jonas, compost facility manager, for their efforts managing the Horticulture Station while I was on medical leave this past fall. I would also like to thank the farm crew Jim Kubik, Lynn Schroeder, Jeff Braland, and Dan Strey for their efforts. Thanks to grad student and Leah Riesselman and student interns Adam Grimm, Jesse Worth, Taylor Goetzinger, Brad Bathey, Cory Rigler, and Jacob Graber, and all of the other student workers for their hard work.

Table 1. Horticulture Research Station, Ames, monthly rainfall and average temperatures for 2013.

	Rainfall (in.)		Temperature (ºF)				Days
Month	2013	Deviation from normal	High 2013	Deviation from normal	Low 2013	Deviation from normal	90º or above
March	2.24	+0.11	35.5	-13.6	20.6	-8.3	0
April	5.72	+2.01	54.1	-9.7	33.9	-6.1	0
May	8.66	+3.98	68.1	-6.6	49.2	-2.9	0
June	3.24	-1.15	78.6	-4.8	60.4	-1.6	1
July	1.07	-2.83	83.6	-3.2	62.1	-4.1	8
August	1.39	-3.27	83.1	-1.4	61.6	-2.0	6
September	1.23	-1.94	79.0	+0.5	54.8	+0.3	2
October	2.51	-0.04	61.2	-3.9	39.6	-2.7	0
Total	26.06	-3.13					17

Research Station Projects

Project	Project Leader
Soil temperatures of overwintering nesting sites	R. Ackerman
Mosquito-borne encephalitis surveillance	L. Bartholomay
The effects of biochar on carrot production	B. Carpenter
The effects of biochar on pepper production	B. Carpenter
Comparison of polymer coated urea fertilizers	N. Christians/D. Strey
Increasing shoot density with green Ncrease	N. Christians/D. Strey
Japanese beetle control on roses	N. Christians/D. Strey
National Kentucky bluegrass test	N. Christians/D. Strey
National perennial ryegrass test	N. Christians/D. Strey
National turf-type tall fescue test	N. Christians/D. Strey
Phytotoxicity of amino acid trial	N. Christians/D. Strey
Plant growth regulator trial	N. Christians/D. Strey
Poa annua' reduction using Poa Cure	N. Christians/D. Strey
Poa annua' seedhead reduction trial	N. Christians/D. Strey
Postemergence control of hard to kill broadleaf weeds	N. Christians/D. Strey
Quackgrass control trial	N. Christians/D. Strey
The effects of summer seeding	N. Christians/D. Strey
Grape off-gassing study	M. Dharmadhikari
Honeycrisp apple trellis	P. Domoto
NC140 apple rootstock trial	P. Domoto
NE1020 wine grape trial	P. Domoto
Miscanthus trial	S. Fei
Pollinators in corn	K. Gill
National Elm tree trial	M. Gleason
Row cover layer equipment study	M. Gleason
Sooty blotch flyspeck nursery establishment	M. Gleason
Sooty blotch flyspeck study	M. Gleason
Strawberry anthracnose study	M. Gleason
Surfactant study in apples	M. Gleason
Bioplastic study	W. Graves
Garden plant study	W. Graves
Redbud breeding trial	W. Graves
Seed dispersal and life history effects on spatial coexistence	W. Harpole
Effects of biochar on ornamental and food crops	C. Haynes
Home Demonstration Garden	C. Haynes
EarthKind rose trial	N. Howell
EarthKind hydrangea trial	N. Howell

Project (continued)	**Project Leader**
Horticulture 465 Field Management	N. Howell
Horticulture 465 Tunnel Production	N. Howell
Research strawberry field installation	N. Howell
Strawberry field installation	N. Howell
Ash pollination study	J. Iles
Bald cypress trial	J. Iles
Flowering crab trial	J. Iles
Shade tree trial	J. Iles
Common garden painted turtle nesting experiment	F. Janzen
The adaptive significance of temperature-dependent sex determination in the painted turtle	F. Janzen
Japanese beetle control on roses	R. Jurenka
Cover crop demonstration	A. Nair
DDGS study	A. Nair
Effects of calcium on fall lettuce production	A. Nair
Effects of fall cover crops on spring potatoes	A. Nair
Effects of seed treatment on lettuce production	A. Nair
Effects of strip till vs. conventional tillage in organic vegetable production	A. Nair
Effects of summer cover crops on fall cabbage production	A. Nair
Effects of summer cover crops on fall lettuce production	A. Nair
High tunnel cover crop study	A. Nair
Mini-tunnel spring crop production study	A. Nair
Plastic mulch and cucumber study	A. Nair
Plastic mulch and sweet corn study	A. Nair
Plastic mulch lettuce study	A. Nair
Sweet potato spacing trial	A. Nair
Sweet potato variety trial	A. Nair
Blackberry training study	G. Nonnecke
Small fruit teaching planting	G. Nonnecke
Student orchard	G. Nonnecke
USDA June bearing strawberry trial	G. Nonnecke
Hardy/disease resistance pear trial	P. O'Malley/L. Schroeder
Hardy peach trial	P. O'Malley/L. Schroeder
Aphid/soybean cyst nematode interaction	M. O'Neal
Native pollinators for cucurbit production	M. O'Neal
Grape growing system vineyard	L. Riesselman
Mini tunnel raspberry study	L. Riesselman
Old vineyard renovation	L. Riesselman

Project (continued)	**Project Leader**
Effects of glyphosate on corn susceptibility to fusarium	A. Robertson
Within field spread of CMN + Goss's Wilt	A. Robertson
Orchard replacement	L. Schroeder
Safe food handling study strawberry field installation	A. Shaw
Irrigation upgrade surrounding the Penn A-4 creeping bentgrass green	D. Strey
Perennial ryegrass and fairway renovation	D. Strey
Turf-type tall fescue fairway renovation	D. Strey
Student Organic Farm	Student Leaders
Bee hive demonstration	A. Toth
Epigenetic, transcriptomic, and behavioral impacts of a maternal signal during wasp caste development	A. Toth
Individual personalities in an insect colony: from molecules to societies	A. Toth
Interactions between honey bee nutrition and viral infection	A. Toth
Tree Swallow nesting	C. Vleck
Prairie cover crops	B. Wilsey