

**AGBIOSCIENCE:
OARDC BRINGING
KNOWLEDGE TO LIFE
2015 ANNUAL REPORT**

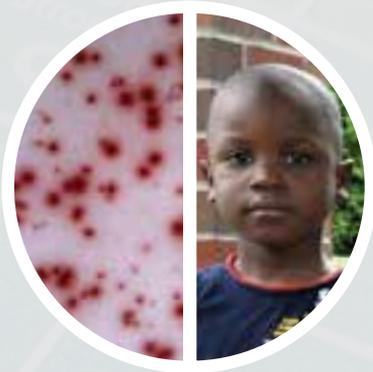


THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

OARDC: A LEADER IN AGBIOSCIENCE

ag·bi·o·sci·ence (ăg'bīō-sī'ens) *n.* the integration of scientific disciplines to address critical needs of food security, safety and health; environmental sustainability; and biobased energy, fuel and products



Food Security, Production
and Human Health



Environmental Quality
and Sustainability



Advanced Bioenergy
and Biobased Products

OARDC Leverages State and Federal Dollars

In fiscal year 2015, OARDC had a portfolio of 566 active grants valued at \$154 million. Some examples are listed below.

FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE:

- \$6.7 million to create a novel, translational, multidisciplinary approach to control poultry respiratory diseases in the United States
- \$1.9 million to explore uniting farmers and scientists in participatory research and education to explain the effects of “soil balancing” on farms, soils, crops, weeds and insects
- \$0.6 million to create germplasm resources for the floriculture and nursery industry at the Ornamental Plant Germplasm Center
- \$0.5 million to study the impact of porcine epidemic diarrhea virus (PEDv) on young pigs and issues related to immunity

FROM THE NATIONAL SCIENCE FOUNDATION:

- \$3.8 million to study the genetic regulation of tomato fruit quality traits

FROM THE OHIO SOYBEAN COUNCIL:

- \$1.0 million to address soybean priority areas

FROM THE OHIO DEPARTMENT OF WILDLIFE:

- \$0.9 million targeted toward wildlife biodiversity in Ohio

WHAT OUR PARTNERS SAY ABOUT OUR WORK



“The partnership between Ohio State and Ohio’s poultry farming community has never been more important than during the current avian influenza crisis. As our industry faces unprecedented disease challenges, having a leader in animal science and veterinary medicine like Ohio State by our side, providing expert guidance and resources, is invaluable.”

— **Jim Chakeres**, executive vice president, Ohio Poultry Association



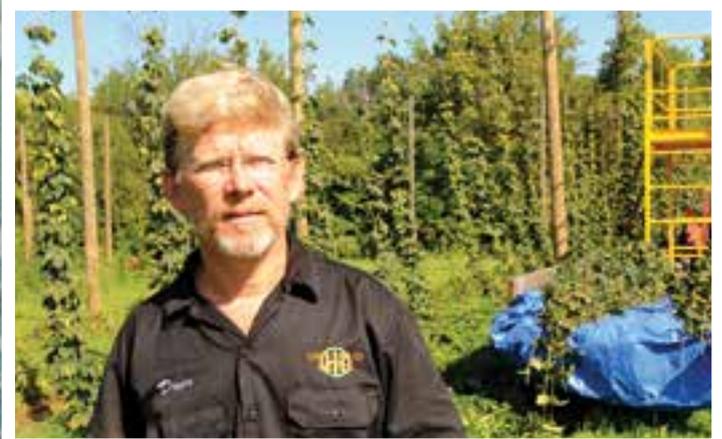
“We’re a nonprofit commercial farming organization providing fresh produce access to food-insecure individuals. We’ve used OARDC’s high tunnel research to increase our impact by providing high-quality produce for more months of the year.”

— **Dana Hilfinger**, farm manager, Urban Farms of Central Ohio



“There continues to be pressure on farmers to be good stewards of our water resources. Beck’s and the College of Food, Agricultural, and Environmental Sciences are conducting joint research to monitor water quality in different cropping scenarios over time. We are also looking at other agronomic studies such as fertilizer utilization and tile spacing.”

— **Scott Beck**, president, Beck’s Hybrids



“After significant research and attending numerous Ohio State hops production workshops, I’ve gone from no hops to now more than 400 plants on 12 acres, supporting two Ohio craft breweries. With Ohio State’s research and input, the economic potential for Ohio hops is huge.”

— **Dave Volkman**, grower, Ohio Valley Hops, Warren County



Helping farmers, brewing industry with hops research

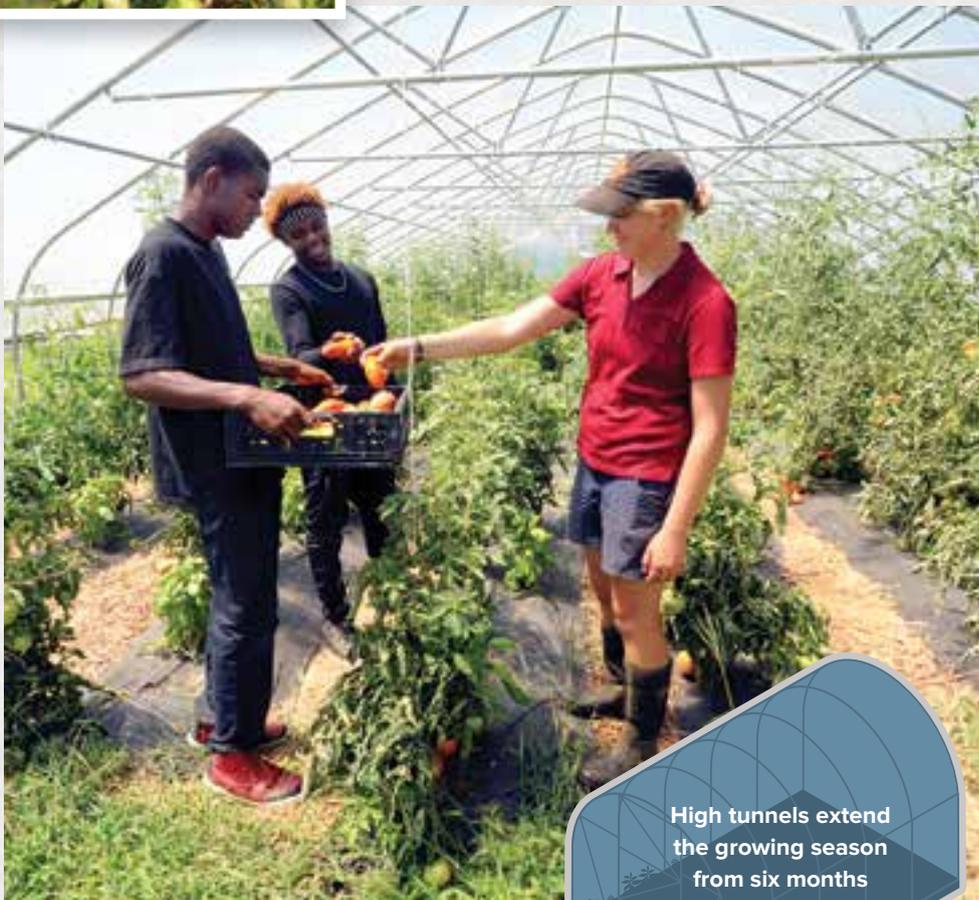
Thanks to OARDC's innovative hops research and trials, this key ingredient in beer manufacturing is making a resurgence in Ohio after a 100-year absence. With assistance from The Ohio State University, local growers are poised to capture the \$30 million in hops sales and related jobs currently sourced out of state by Ohio's growing craft brewing industry, which produces 1.09 million barrels of beer annually — requiring 4 million pounds of dried hops.

To meet the industry's current demand, Ohio farmers would need to plant an estimated 6,000 acres of hops. Today, there are only 100 acres of the crop in Ohio, so the potential for growth is huge.

More: go.osu.edu/hopsres



At current-use rates, 6,000 acres of hops are required to meet Ohio craft brewers' needs.



High tunnels extend the growing season from six months to year-round.

Extending the growing season, lowering costs with high tunnels

OARDC scientists are working across Ohio to widen the use of high tunnels, which help farmers grow more food of higher quality. Especially fit for small and urban farms, the simple, low-cost structures make the growing season longer. Inside, fruits and vegetables ripen earlier in spring and yield later in fall, with no need for fossil-fuel heat. In Ohio, high tunnels can extend a farm's marketing season from six months to year-round. Hundreds to thousands of pounds of more and different kinds of produce are taken from tunnels when outside fields are dormant.

More: hcs.osu.edu/vpslab

Improving water quality with Field to Faucet

Conceived and funded in 2014 by the College of Food, Agricultural, and Environmental Sciences, Field to Faucet is a comprehensive research and outreach effort seeking to ensure safe drinking water in Ohio while maintaining an economically productive agricultural sector. Projects underway include a tri-state, cost-share program to help protect water quality in Ohio's Western Lake Erie Basin; creation of an app for farmers to record nutrient application rates and methods; and development of a weather-risk-management tool to warn farmers of impending storms to help lessen the risk of runoff from nutrient application.

More: field2faucet.osu.edu



A key goal of Field to Faucet is to reduce harmful algal blooms.



Foodborne illnesses cost Ohio up to \$2.9 billion annually.

Examining the high cost of foodborne illnesses

Foodborne illnesses cost Ohio up to \$2.9 billion every year and between \$1,039 and \$1,666 per case, according to a 2015 national study conducted by OARDC economists. The study is a first-of-its-kind economic analysis designed to offer public health authorities detailed information to help evaluate the cost-effectiveness of food-safety education efforts and how best to prioritize resources. Costs related to foodborne illnesses fluctuate between states for various reasons, including population, cost of medical care and other factors. Those variations, the study found, can have a significant impact on local decision making.

More: go.osu.edu/fdillcost

Making the most of precision ag, 'big data'

In the world of agriculture, having access to rich data sources about field conditions, weather patterns, pests and more can make a huge difference in the profitability and sustainability of Ohio farms. For that reason, OARDC is working with farmers, industry groups and state agencies to boost access to and analysis of field data gathered from new-generation farm machinery, satellite data and remote-sensing imagery captured by unmanned aerial vehicles. A key goal is to create a repository that will then be made available to growers in a user-friendly manner to help them make data-driven decisions.

More: fabe.osu.edu/precisionag



Smart tech can save farmers money in fertilizer and agrochemicals.



Helping foundries, growing plants

Studies conducted by OARDC have found that spent foundry sand, when put back to use in some soil applications, is safe for people's health and the environment. This work has opened new business doors. Ohio's green industry now can manufacture and market new soil mixes using the sand. And the state's many metal casting foundries can reduce their landfilling costs, save money and stay competitive. Ohio has 200-plus foundries that provide 22,000 jobs. Reusing 10 percent of the 10 million tons of spent foundry sand sent to landfills every year can save U.S. foundries about \$40 million annually.

More: go.osu.edu/SpentSandGetsSecondLife



Ohio is the No. 1 metal casting state in the nation.

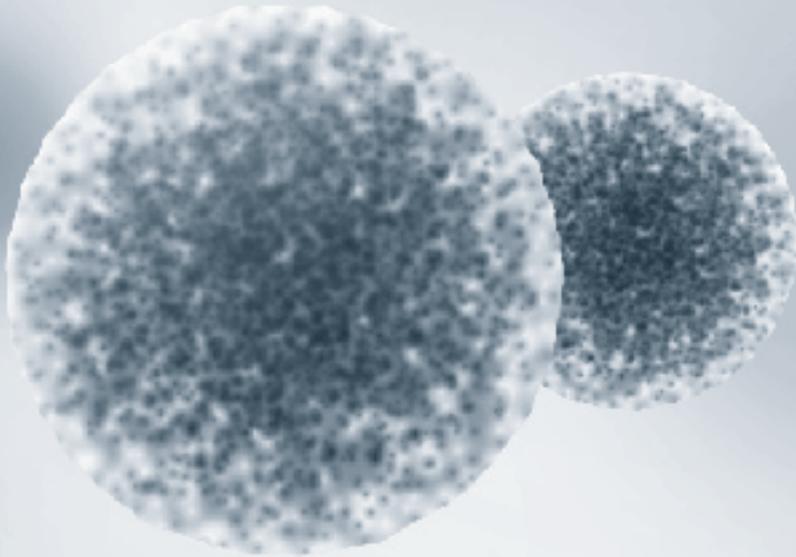
Linking plants, health at new garden

OARDC's Secret Arboretum has many gardens, but its newest addition stands out for its therapeutic and research purposes. Established in summer 2015, The Lemmon and Rice Health and Wellness Garden has been designed to boost visitors' sense of well-being and provide opportunities for research into the impact gardens and nature have on human health. OARDC has teamed up with The Ohio State University College of Nursing to conduct future research in the garden. Among other benefits, gardening and green spaces have been found to help fight obesity, stress, chronic pain and complications from dementia.

More: go.osu.edu/healthgarden



Gardens can help fight obesity and chronic pain.



Tackling avian flu and other dangerous poultry diseases

A new avian flu outbreak has devastated the U.S. poultry industry this past year, killing close to 50 million birds and sending egg prices soaring. OARDC experts are conducting innovative research to improve detection, prevention and management of avian flu and other respiratory diseases that threaten the state's valuable poultry industry.

Researchers have also developed safe methods to compost dead birds and prevent the spread of disease. The stakes are high in Ohio, one of the nation's top producers of eggs and turkeys and home to an industry worth \$2.3 billion, which directly supports more than 14,600 jobs.

More: go.osu.edu/birdflu



Excelling in research on a global scale



OARDC scientists are international leaders in their disciplines, their work often recognized for its global reach and impact. For instance, virologist Linda Saif became in 2015 the first woman and the first Ohio State researcher to receive the prestigious Wolf Prize in Agriculture, awarded by the Wolf Foundation of Israel. The prize recognizes Saif's groundbreaking work on viral diseases of critical importance to farm animals, food safety and human health.

More: go.osu.edu/wolfprizeag

OARDC Locations in Ohio

1. Wooster
2. Columbus

Outlying Agricultural Research Stations

3. Ashtabula
4. Eastern
5. Jackson
6. Muck Crops
7. North Appalachian Experimental Watershed and Pomerene Lab
8. Northwest
9. OSU South Centers
10. North Central
11. Western



OARDC Administration

David A. Benfield, Associate Vice President for Agricultural Administration and Director of the Wooster Campus, The Ohio State University College of Food, Agricultural, and Environmental Sciences

Jerry Bigham, Interim Associate Dean for Research and Graduate Education, The Ohio State University College of Food, Agricultural, and Environmental Sciences

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[youtube.com/user/OARDC](https://www.youtube.com/user/OARDC)
[facebook.com/osuoardc](https://www.facebook.com/osuoardc)
twitter.com/foodagenvnews

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u.osu.edu/cfaesimpact
oardc.osu.edu

Steve Slack served as OARDC Director until retirement on December 31, 2015.

The Ohio State University is an Affirmative Action/Equal Opportunity Institution. For more information: go.osu.edu/cfaesdiversity.



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College of Food, Agricultural, and Environmental Sciences

The Ohio State University College of Food, Agricultural, and Environmental Sciences is a large, diverse college supporting 10 academic units, the Ohio Agricultural Research and Development Center, Ohio State University Extension, and two-year degree programs offered by the Agricultural Technical Institute. The college has campuses in Columbus and Wooster, and has a presence in all 88 Ohio counties. It serves as the home for 330 faculty members, 1,230 staff members and more than 3,700 undergraduate and graduate students.