

OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER

OARDC

2009 Annual Report



Bringing Knowledge To Life

<http://www.oardc.osu.edu>



ON AN ANNUAL BASIS OARDC DIRECTLY GENERATES:

\$156.3 million in total economic output

1,609 jobs in Ohio

\$59.2 million in personal income for Ohio residents

\$5.5 million in state and local taxes



OARDC is a premier institution committed to safe, healthy, and affordable food and agricultural products; sustainable food and agricultural systems; strong rural and urban communities; stewardship of natural resources and the environment; and keeping Ohio positioned favorably in a global economy.

OARDC is the intersection for superior, diverse, unbiased research. Housed within The Ohio State University, OARDC is the largest university agbioscience research center in the nation.

WHAT OARDC'S PARTNERS SAY:

"OARDC has the brain power, the talent, and the facilities to help us get a jump-start on these technologies." — Clemens Halene, Vice President of Engineering, quasar energy group (formerly Schmack BioEnergy)

"The Ohio State University plays an important role in research and outreach by providing sound science to monitor, measure, and place a quantifiable value on the types of emission reduction opportunities that are available." — Mark Wilson, Land Stewards, LLC

"The collaboration has brought us to a powerhouse in technical capabilities with OARDC and encouraged us to expand our market research, see opportunities, and build our thinking into a seven-year commercialization strategy. The process took a lot of discipline to get everything to happen, but the collaboration created value. It literally changed our business plan." — Chuck Anderson, Director, Technical and Marketing Development, The Andersons



OARDC has identified three signature areas that align Ohio's highest needs with the Center's greatest strengths, strategically directing its resources to advance knowledge and generate economic development opportunities.

- **Advanced Bioenergy and Biobased Products**

As the importance of renewable sources for energy and materials increases, research and industry partnerships come together to develop biomass-based advanced energy technologies and value-added biobased products.

- **Environmental Quality and Sustainability**

OARDC research enhances the understanding, protection, and remediation of the environment and ecosystems to ensure long-term sustainability.

- **Food Security, Production, and Human Health**

This focus area aims to improve agricultural production; enhance the quality of food and feed; ensure an adequate, affordable, and safe food supply; and maintain agrosecurity to ensure food security and the basics of nutritional health for a growing global population.

400

kilowatts of electricity

The amount of energy to be produced each day from 40–50 tons of waste

Turning waste into electricity

OARDC is collaborating with [quasar energy group](#) (formerly Schmack BioEnergy), a Cleveland-based company that produces biogas from municipal and agricultural waste and turns it into electricity. The company has established a laboratory and engineering office on OARDC's Wooster campus and plans to build a biogas facility that is expected to supply one-third of the campus's energy needs. It is also working with researchers to optimize methane-production technologies and new products from waste streams.



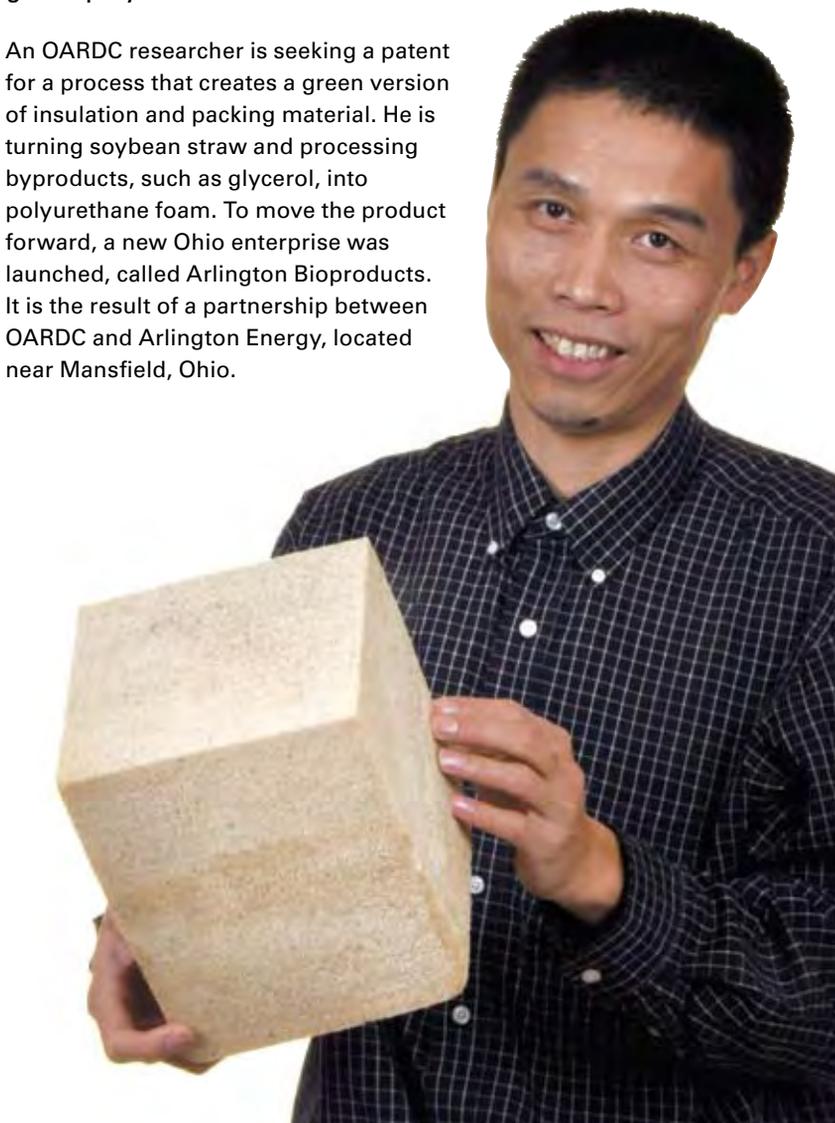
20–30

New jobs for Ohio



Glycerol, straw to fill green polyurethane demand

An OARDC researcher is seeking a patent for a process that creates a green version of insulation and packing material. He is turning soybean straw and processing byproducts, such as glycerol, into polyurethane foam. To move the product forward, a new Ohio enterprise was launched, called Arlington Bioproducts. It is the result of a partnership between OARDC and Arlington Energy, located near Mansfield, Ohio.



40%

The increase in cheese production at just one plant, worth \$500,000 retail/day



Trading credits saves municipalities dollars

A successful nutrient trading effort led by OARDC on the Sugar Creek watershed allowed a cheese company to expand, creating jobs and revenue. This same effort will be applied to the critical Upper Scioto watershed, which feeds Columbus and 20 central Ohio counties, as well as the 27 counties in the Muskingum watershed. A nutrient trading effort allows companies to pay farmers and landowners to establish conservation techniques that protect water quality. This approach allows businesses and municipalities to meet water quality mandates with less expensive wastewater-treatment facility upgrades.

\$5 million

Value of a Third Frontier grant aimed at developing a safer, more environmental, and more economical delivery system for agronomic products

A safer way to control pests



An environmentally sound and more economical approach to pest control on golf courses is being applied to agricultural cropland through an OARDC collaboration with The Andersons, Inc., a Maumee, Ohio, company. Together they are advancing the use of granular technology

to deliver fertilizer, pesticides, and biological materials. Granular products eliminate spray drift, making them more environmentally sound, and are more economical to transport.

\$30 MILLION

Annual savings to the U.S. foundry industry



New use for waste product benefits environment, economy

OARDC researchers collaborated with the USDA and U.S. EPA to conduct a risk assessment of the use of spent foundry sand, a byproduct of the foundry industry, as a soil additive. Based on the findings, EPA is now developing the first regulatory guidelines for using some of the 10 million tons produced nationwide each year. Recycling the foundry sand is expected to keep at least 10 percent of it out of landfills, saving the industry an estimated \$30/ton.

4-10 TONS

The amount of carbon dioxide an acre of trees accumulates in a year

80 TONS

The amount of carbon a 140-acre Ohio wetland can sequester in a year

Varied approach to capturing carbon best

As policymakers wrestle with such issues as carbon sequestration and granting carbon credits, they can rely on OARDC research to help them make sound decisions. OARDC research shows that no-till farming captures 500 pounds of carbon per acre more than conventionally tilled soils, but is just one way to slow global warming. Decisionmakers also need to consider forestation and methane recovery as a way to capture carbon.





New farm policy concept challenges farmers

Welcome to farm policy for 21st century farming: ACRE — the Average Crop Revenue Election program contained in the new Farm Bill.

ACRE focuses on revenue, not price; hence, it adjusts with market conditions rather than being fixed, as are traditional farm programs. To date, about 130,000 Farm Service Agency farm units nationwide have been enrolled in ACRE, 5,700 of them in Ohio. Carl Zulauf, an Ohio State University agricultural economist with the Department of Agricultural, Environmental, and Development Economics, provided leadership in developing the concepts that became ACRE and is helping educate farmers about the program. "It's different to think about the world in terms of revenue and risk management, rather than price," notes Zulauf. "The low sign-up is not unexpected because, just as with adopting new products, choosing a new program over a known program is tough to do."

More information: <http://aede.osu.edu/people/publications.php?user=zulauf.1>



Stronger STEM teaching for a stronger economy

Two OARDC programs specifically help teach the STEM disciplines — science, technology, engineering, and math — in Ohio to high school and college students. The OARDC Research Internship Program (ORIP) offers summer

research internships to area students interested in careers in science. Select high-school juniors and seniors and college undergraduates work directly with OARDC scientists. ORIP Director Parwinder Grewal said the program "gives students experience that will set them apart from others for college applications and future career opportunities." And OARDC's K-12 Outreach effort hosts students of all ages — more than 2,000 from 71 schools in 17 counties last year alone — for tours and special workshops. They tour labs, talk with scientists, and see both the fun and importance of science. Ohio leaders call ramped-up STEM teaching key to the state's economic future.

16,655

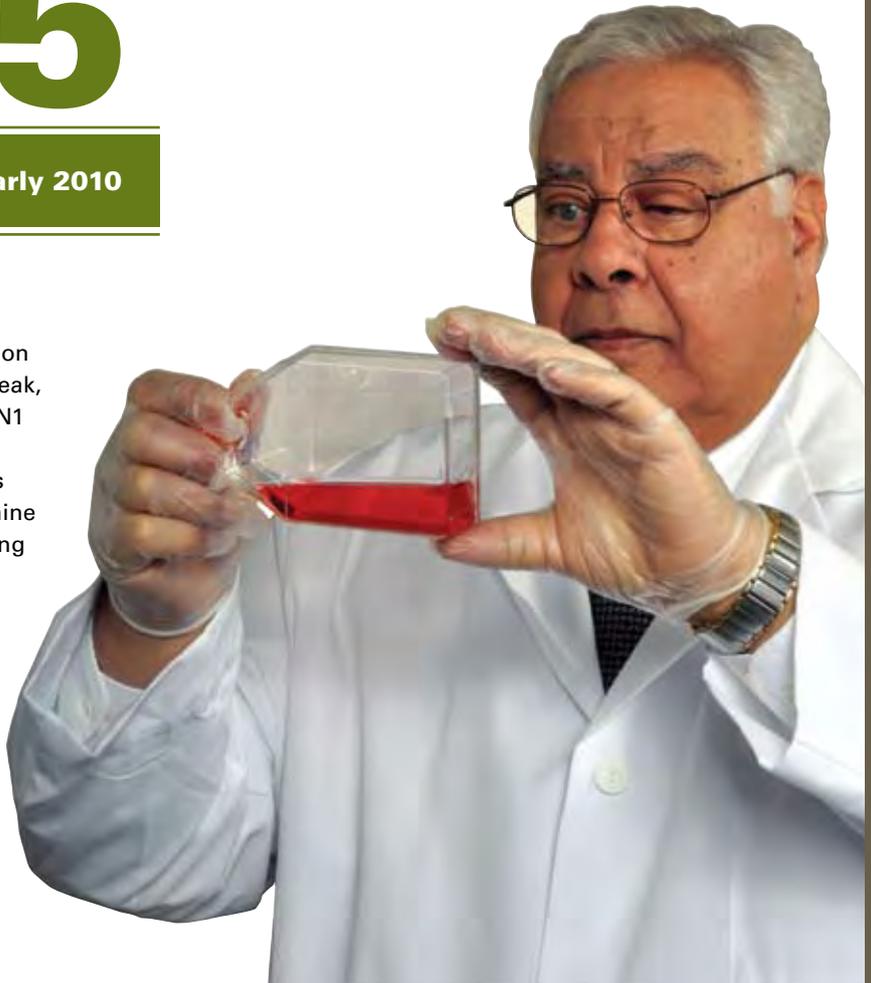
Deaths worldwide attributed to H1N1 in early 2010

Learning about diseases before an outbreak



Before the World Health Organization declared H1N1 as a major flu outbreak, science had a jump-start on the H1N1 virus, thanks in part to research conducted by OARDC. Researchers applied reverse genetics to determine the genetic makeup, disease-causing mechanisms, and immunity of the influenza virus. This research will

help identify how cross-species infection occurs in influenza viruses leading to diagnostic tools that identify new viruses capable of jumping from animals to people. The work will also provide information for the development of more effective vaccines. A planned Plant and Animal Agrosecurity Research Facility on the Wooster campus will enhance researchers' ability to prepare and respond to crisis.



\$144 million

Increase in regional income if local food purchases increase just 1 percent



Building on local foods

To grow local economies, starting with food, OARDC is working with the Advance Northeast Ohio group to promote collaboration and grow businesses around local

foods and agbioproducts. The first steps are to inventory agricultural resources in the region and create a business portfolio with at least ten model business cases.

22,000

The expected reduction in prostate cancer incidences if an OARDC tomato product reduces cancer by 10 percent



Fighting cancer with foods

OARDC collaborative research is leading to products that help prevent certain cancers, including oral and prostate. Researchers are studying plants at the molecular level, breeding plants with more phytonutrients, creating products that effectively use those phytonutrients, and testing them in the lab and with clinical patients.

OARDC LOCATIONS IN OHIO

OARDC's Outlying Research Stations are vital to the success of the state's ongoing agbioscience research. While the laboratory is fundamental to any research program, the true test of Ohio's agricultural research takes place in the field.

The Outlying Agricultural Research Stations provide facilities for scientists to conduct field experiments under the state's numerous climatic conditions. Soil type, terrain characteristics, climate, water supply, marketing opportunities, and human and natural resources are integrated to make this site-specific research responsive to the distinct needs of every part of our diverse state.



1. Northwest Agricultural Research Station, Wood County

2. North Central Agricultural Research Station, Sandusky County

3. Muck Crops Agricultural Research Station, Huron County

4. Wooster Campus, OARDC, Wayne County

5. Ashtabula Agricultural Research Station, Ashtabula County

6. North Appalachian Experimental Watershed, Coshocton County

7. Pomerene Forest Laboratory, Coshocton County

8. Western Agricultural Research Station, Clark County

9. Columbus Campus, OARDC and OSU, Franklin County

10. Eastern Agricultural Research Station, Noble County

11. Ohio State University South Centers, Pike County

12. Jackson Agricultural Research Station, Jackson County

OARDC ADMINISTRATION

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The Ohio Agricultural Research Development Center (OARDC) embraces human diversity and is committed to ensuring that all research and related educational programs are available to clientele on a nondiscriminatory basis without regard to race, color, religion, sex, age, national origin, sexual orientation, gender identity or expression, disability, or veteran status. This statement is in accordance with United States Civil Rights Laws and the USDA.

Steve Slack, Ph.D., Associate Vice President for Agricultural Administration and Director, OARDC

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