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OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER

Accomplishments and Growth Strategies for Economic Development

Results of an OARDC Program Review Conducted by:
Technology Partnership Practice
Battelle Memorial Institute

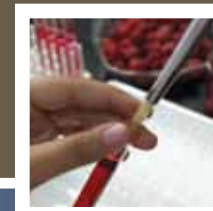
The Ohio Agricultural Research and Development Center (OARDC) has grown its basic expenditure impacts on the State of Ohio. In fiscal year 2008, OARDC generated the following:

- **1,609 jobs.**
- **\$156.3 million** in Ohio economic output.
- **\$59.2 million** in personal income for Ohio residents.
- **\$5.5 million** in state and local taxes.

With more than 600 research and development projects performed at OARDC each year, it is impractical to measure the impact of every project. However, OARDC has yielded a wide range of functional impacts:

- A potential **\$22 million savings** in the Ohio horticulture industry has been generated by advancing biocontrol fungicides versus chemical fungicides.
- The development of media technology has led the \$2.8 billion Ohio nursery industry to **employ 96,000 personnel.**
- Poultry and egg production in Ohio has been safeguarded via multiple technologies, thus **securing an \$861 million industry and 8,700 jobs.**
- **Ohio's exposure to \$65 million in negative impacts** attributable to annual livestock disease losses **has been reduced.**
- Collaborations have led to the potential development of a new natural rubber production industry for Ohio, with a projected **economic impact of 165 jobs and \$130 million.**
- **Growth in Ohio's \$11.1 billion food processing sector has been sustained** via the development of new functional food products, advanced ingredients and packaging technologies.
- **Ohio has been protected from \$46.6-\$93 million in foodborne illness health costs associated with *Salmonella*.**
- **Feedstock and process development have driven Ohio's emerging position** in the multi-billion dollar biofuels and biobased products industry segments.
- Value has been created from waste streams through their conversion into **value-added biofuels and bioproducts.**

BRINGING KNOWLEDGE TO LIFE



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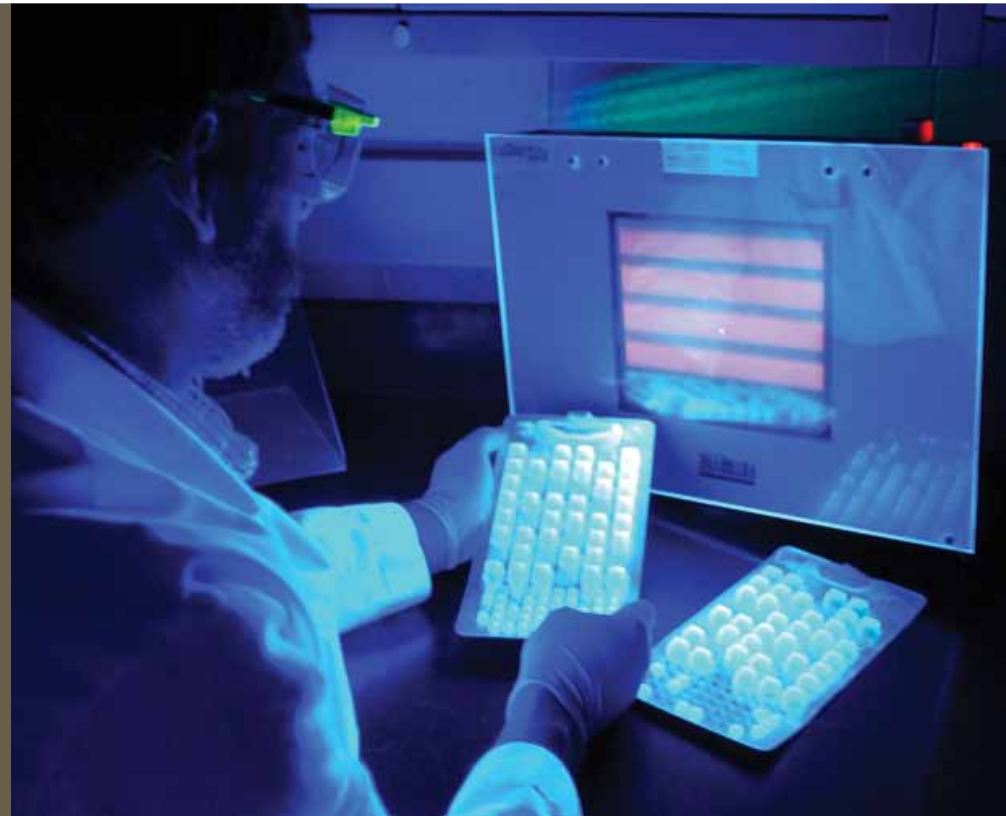
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The Ohio State University is the clear leader within the State of Ohio for agricultural research and development, performing 94.8% of all agriculturally focused research. Ohio State's \$59.3 million in agricultural research and development reflects an impressive 59% increase since 2002, compared to a 19% increase in agriculturally related research and development nationwide.

The dynamic work of OARDC in targeting agbiosciences growth is currently paying significant dividends, both for the institution and for the State of Ohio:

- **OARDC-sponsored research grew 23.2%** between 2004 and 2008, increasing from \$19 million in 2004 to \$23.4 million in 2008.
- With 108 research faculty, the current year's \$23.4 million in **research funding averages to \$217,000 per faculty member.**
- **A 64% growth rate in funding** in the applied and commercially oriented "nonfederal research funding" category was achieved between 2004 and 2008.
- Since 2004, innovations have generated **57 invention reports and 23 patent applications.**



The past five years have seen significant growth in public awareness of the economic benefits of the agbiosciences. Compared to 2004, the time of Battelle's initial study, there is much greater knowledge of the critical importance of agbiosciences to our economic future. This awareness is especially prevalent in the State of Ohio where the agbiosciences sector is the largest industry, accounting for 1 million Ohio jobs and \$98.2 billion in annual economic output. Agbiosciences innovations are driving new, highly visible economic opportunities for American states, and the State of Ohio has been an early mover in recognizing the economic development potential of biobased resources.

Since 2004, OARDC has been highly proactive in developing new programs and funding streams, infrastructure and relationships that drive progress and expand economic impacts in Ohio's agbioscience economy.

By focusing on areas of research and development excellence and strategic importance, OARDC has directed its resources in new and innovative ways to generate technology-based economic development for Ohio. Today, OARDC is positioned to focus on three signature research and development areas:

- **Food Security, Production and Human Health**
- **Advanced Bioenergy and Biobased Products**
- **Environmental Quality and Sustainability**



OARDC, despite the constantly evolving nature of the agbiosciences field, is well-positioned to maintain its competitive advantage and capitalize on its resources to continue to deliver solutions to Ohio's agricultural issues and needs. Since the 2004 Battelle report, a number of resources have been added at Ohio State, resulting in added capacity for research excellence and technology development. Resources and programmatic initiatives include the following:

- **AgBioscience Centers of Innovation.** To further enhance and accelerate the process of knowledge generation and implementation in Ohio, OARDC and OSU Extension have partnered to create six AgBioscience Centers of Innovation. The centers are designed to transform discovery and knowledge into innovations that have positive economic, social and environmental impacts, while contributing to local and state economies and promoting an entrepreneurial culture within The Ohio State University.
- **ATECH.** A unique agbiosciences-focused business development arm of OARDC and OSU Extension, ATECH is designed to link industry with OARDC research; to market OARDC capabilities; to facilitate the commercialization of technology; and to prospect for research sponsors.
- **BioHio Research Park.** Located on OARDC's Wooster Campus, the BioHio Research Park will foster collaboration between Ohio State/OARDC, the private sector and others to promote the market application of scientific research and foster economic development for the citizens of the State of Ohio.
- **Plant and Animal Agrosecurity Research (PAAR) Facility.** PAAR is a secure biocontainment facility for research on organisms that cause diseases in food animals and on diseases of plants that can cause significant economic impact to Ohio agriculture. PAAR will allow OARDC scientists to proactively develop new methods of controlling diseases of plants and animals.
- **Feedstock Processing Research Facility.** This new facility will increase the quality, nutritional value and mixing precision of feeds for OARDC's internationally recognized livestock and poultry research programs. It also enables researchers to extract the oils and proteins from field crops for innovative applications in bio-based fuels, chemicals, polymers and materials.
- **Molecular and Cellular Imaging Center.** This cutting-edge center provides services in the areas of genomics and molecular biology, DNA sequencing, high-throughput genotyping and massive parallel sequencing. Other equipment in the MCIC consists of light and confocal microscopes, two transmission electron microscopes and two scanning electron microscopes.

INTO THE FUTURE:

Battelle's assessment of the economic impact of OARDC shows the Center to be a high impact driver of economic progress in the State of Ohio. The traditional and emerging applications of OARDC knowledge, research and development place the institution in a strong position as a technology-based economic development engine for Ohio. OARDC has been proactively preparing to take advantage of its research and development core competencies and their potential for innovation, new technology development and commercialization.

The position and promise of agbiosciences as a key driver of future growth for Ohio has been reinforced by the recognition of the sector as a strategic asset by the State of Ohio and the Ohio Department of Development. Serving as the research and development arm of the only college of agriculture in the state, within Ohio's only land-grant university, OARDC is the primary agbiosciences research asset for the State of Ohio. As Ohio seeks to propel its economy forward using agbiosciences as an accelerant, it is clear that OARDC must be considered a prime strategic asset for further state investment and development.

