



Ohio State veterinary students visit a turkey farm to learn about avian flu biosecurity. Outreach and education are key to protecting the poultry industry from infectious diseases.

Protecting Ohio's valuable poultry industry from deadly avian flu

Since November 2014, an outbreak of highly pathogenic avian influenza H5 spread by wild waterfowl has gripped the U.S. poultry industry, killing close to 50 million birds in at least 19 states.

While the virus has not yet reached Ohio, Ohio State University Extension experts have been helping poultry producers learn about the disease, boost biosecurity measures on the farm and prepare to minimize the flu's impact if it were to reach the state.

"Our industry needs to adopt tighter biosecurity, as this virus can spread wide and fast, and outbreaks could reoccur in spring and fall," said Mohamed El-Gazzar, OSU Extension poultry veterinarian. "We are also helping with logistical challenges such as identifying the best way to dispose of infected birds in case of an outbreak."

To address this challenge, biosystems engineer Fred Michel developed a plan for Ohio egg farms to compost up to hundreds of thousands of dead chickens on-site, reducing the risk of contamination to other layer houses or nearby farms.

More: go.osu.edu/birdflu

"We keep a very good working relationship with Ohio State. We call upon researchers and veterinarians with questions on various fronts related to poultry diseases and food safety. They have many resources and expertise that we rely on all the time. They truly care about our industry."

— **Tim Barman**, veterinarian,
Cooper Farms



*Mohamed El-Gazzar, middle,
with Tim Barman, right*



ESSENTIALS

- The current avian flu outbreak is a serious threat to Ohio's \$2.3 billion poultry industry, which directly supports more than 14,600 jobs. Nationally, Ohio ranks second in egg production and ninth in turkey production.
- If Ohio were to experience a poultry production loss of 50 percent, OSU Extension estimates the ripple effect would reach \$1 billion in overall economic losses, including \$815,000 in annual wages.
- Heavy losses to Iowa's egg farms from this virus have sent egg prices soaring across the United States. If the virus reaches Ohio, prices will increase even more dramatically, affecting both consumers and food manufacturers.

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The need for food preservation classes offered by Shannon Carter, left, and other Extension professionals rose sharply in 2015 after botulism struck a church potluck.

OSU Extension delivers answers during, after botulism crisis

It was a church potluck like any other. But within days, botulism from improperly home-canned potatoes killed one woman and hospitalized 24 others.

Shannon Carter, Fairfield County family and consumer sciences educator, and other Ohio State University Extension professionals jumped into action in April 2015, providing urgently needed information to the community, media and health department officials.

Food safety is a prime focus of Extension, with specialist Sanja Ilic working with produce growers and restaurants to reduce risks in food handling and on projects helping high-risk consumers, including the blind and cancer survivors.

In Fairfield County, Carter increased fivefold the number of food preservation classes she offered in 2015.

“Anyone who cans (food) should take the class,” said Deb Kilbarger, Fairfield Department of Health registered sanitarian and food program supervisor. “Even if you’ve done it forever, there might be a safer way. Extension is the only place I’m aware of that offers classes like this. Hopefully, these classes will prevent anything like this from happening again.”

More: go.osu.edu/homefoodpresv

“As soon as it happened, people were relying on the Extension office to get education out about canning and botulism. Even people who have canned for a long time can still learn something new. That’s why these classes are so important.”

— **Aubry Shaw**, daughter-in-law of Kim Shaw, who died from the botulism outbreak



ESSENTIALS

In 2014, OSU Extension offered 181 food safety classes to 2,458 participants in 50 counties. Of those who took home food preservation classes:

- 78 percent reported they would always use current, official canning recommendations, which is up from 16 percent who, before attending the class, said they would always do so.
- 67 percent reported they would always acidify tomatoes before water-bath canning them — a vital food safety precaution — which is up from 16 percent before the class.
- 66 percent reported they would always use a pressure canner to process low-acid foods, which is up from 22 percent before the class.

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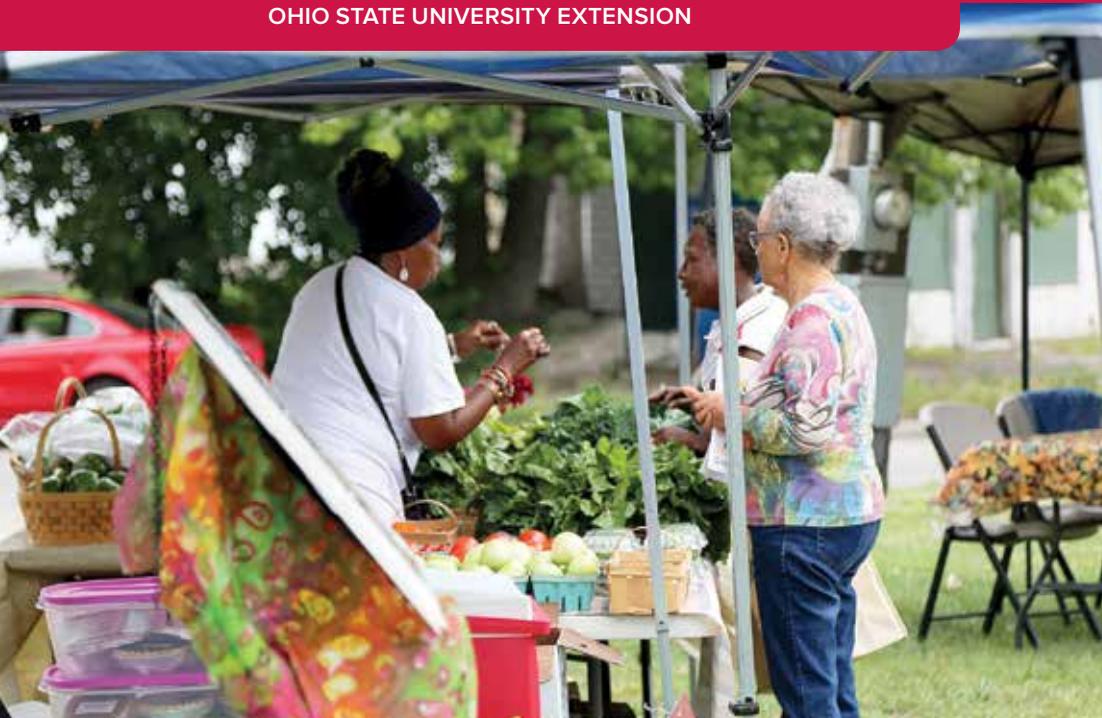
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Cleveland's Gateway 105 Farmers' Market is one of 30 such markets in and around Cuyahoga County participating in Produce Perks.

Boosting urban food security, and with it, farms and nutrition

A program called Produce Perks is tackling northeast Ohio's urban food deserts while boosting small farms and food security. Participating farmers' markets give two-for-one incentive tokens, or "Produce Perks," to customers who use an Ohio Direction Card — their Supplemental Nutrition Assistance Program benefits — to buy food. The program provides a dollar-for-dollar match up to \$10 for every dollar spent at the market on fresh produce. The Cleveland-Cuyahoga County Food Policy Coalition — established by local food leaders including Ohio State University Extension's Cuyahoga County office — runs the program.

"Produce Perks has brought many low-income and food-insecure residents to farmers' markets for the first time," said Nico Boyd, community development coordinator in the office and the coalition's project coordinator. "Not only does it help stretch people's food dollars to buy more fresh, local produce, it keeps food dollars here in our local economy and helps farmers grow their customer base and their enterprise."

More: go.osu.edu/ProducePerks

"Families can stretch their food dollars by utilizing Produce Perks to double their whole-food purchases. The relaxed atmosphere at farmers' markets is perfect for conversations about meal preparation, food storage and preservation, all of which decrease food insecurities."

— **Veronica Walton**, farmers' market manager, Famicos Foundation, Cleveland



Veronica Walton



ESSENTIALS

- Some 55 percent of Clevelanders live in food deserts. People in food deserts have little access to fresh, healthy, affordable food.
- OSU Extension's Cuyahoga County office recently expanded Produce Perks to include 30 area farmers' markets. A subgrant from Wholesome Wave, a nonprofit targeting food issues, funded the expansion.
- Another Wholesome Wave subgrant allowed OSU Extension's Hamilton County office to expand a produce-buying incentive program in greater Cincinnati.
- When the Broadway Farmers' Market in Cleveland's Slavic Village joined the Produce Perks program, it saw a 191 percent increase in Direction Card sales in a single year, according to an article in northeast Ohio's *Fresh Water* e-magazine.

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Ohio 4-H is leading efforts to help youths gain a deeper understanding of one of the most vital 21st century concerns: assuring access to fresh, clean water.

4-H water projects are making a splash in Ohio, around nation

Water is rising in prominence in Ohio 4-H youth development activities.

In the Water Windmill Challenge, teams create mock-ups of wind-operated water supply systems. “There are many possibilities of how to meet the challenge,” said creator Bob Horton, Ohio 4-H specialist. “If their structure fails, students quickly want to reinvent it. They don’t realize it, but this activity introduces them to engineering.”

In *Ways of Knowing Water*, a project idea starter for individual 4-H members, activities help youths sharpen awareness about their local watershed and where their household water originates.

In a new idea starter, *Field to Faucet: Nutrients, Sediment and Water Quality*, activities focus on preventing harmful algal blooms. Co-author and 4-H educator Jackie Krieger said, “For many around the world who have little access to fresh, clean water, we owe our best science and dedicated action to understanding this basic human need. Who knows what spark might be ignited in the minds of 4-H members by these activities?”

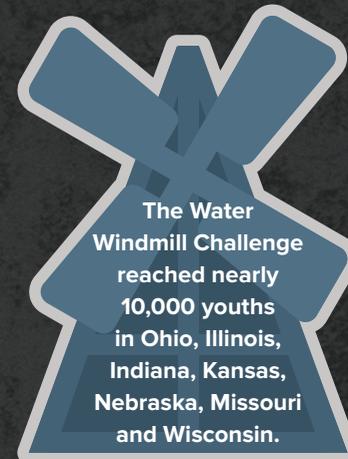
More: go.osu.edu/oh4hsci

“With 4-H, you get to actually experience what you’re learning about. You don’t just learn by reading about it. It really enhances the whole experience.”

— **Meera Nadathur**, 15, of Hamilton County, who took the *Ways of Knowing Water* 4-H project and plans to study environmental sciences in college



As part of her 4-H project, Meera Nadathur learned about the drinking water purification process firsthand by visiting the Greater Cincinnati Water Works treatment plant.



ESSENTIALS

OSU Extension’s 4-H STEM (science, technology, engineering and math) education program is making a mark regionally and nationally by developing projects including:

- The Water Windmill Challenge. In 2015, nearly 10,000 youths in Ohio, Illinois, Indiana, Kansas, Nebraska, Missouri and Wisconsin participated in this challenge as part of the 4-H Ag Innovators Experience, sponsored by the National 4-H Council and Monsanto.
- The Fish Farm Challenge, which was named as the 2014 4-H Ag Innovators Experience. More than 8,000 youths engineered a system to evenly dispense soy-based fish food pellets in an aquaculture tank.
- The 4-H National Youth Science Experiment, the world’s largest youth-led science experiment. Ohio 4-H created the activities used in this program in 2008 and 2012.

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Thanks to a new 4-H program, many students at George Washington Carver STEM Elementary School in Cleveland now say science is their favorite subject.

‘I want to be a scientist,’ thanks to 4-H Agri-science in the City

Not a teacher. Not a fireman.

When he grows up, 8-year-old Jamir Green wants to be a scientist.

“It seems fun,” he said. “You can make chemicals and medicines.”

As a second-grader at George Washington Carver STEM Elementary School on Cleveland’s East Side, Green was inspired by Rob Isner, who has led the school’s 4-H Agri-science in the City program since it began in 2014.

In Cincinnati’s Over-the-Rhine neighborhood, Tony Staubach offers the same program at Rothenberg Preparatory Academy.

As 4-H staff members, Isner and Staubach integrate food- and farm-related science activities during school, in after-school programs, in 4-H clubs and at summer day camps.

“When I started the program, most students said science was their least favorite subject,” Isner said. “Now, more than half say it is their favorite. They only have the agri-science program once a week, but we’re having an impact.”

More: go.osu.edu/agrisci2015

“The 4-H Agri-science in the City program is invaluable. The students have watched chicks hatch, explored the properties of air, and conducted experiments with force and motion, sound and vibration. The scientific process is continually reinforced, fostering skills of observation, critical thinking, accurate data collection and cooperation.”

— **Annette DiGirolamo**, second-grade teacher (retired), Rothenberg Preparatory Academy



Tony Staubach with STEM students



ESSENTIALS

Agri-science in the City programs provided by Ohio 4-H focus on students in kindergarten through sixth grade.

- In Cincinnati, nearly 500 students participated from March 2014 through May 2015, when students who say they believe it is possible to farm in the city increased from 54 percent to 74 percent, and students indicating they want to work in food or farming increased from 15 percent to 31 percent.
- In Cleveland, nearly 600 students participated during the 2014–15 school year. At the end of the year, 83 percent gave the program an “A;” 67 percent said they wanted to learn more about agriculture the next year; and 42 percent said it was “very likely” they would attend a career tech program in agri-science in high school.

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OSU Extension's certification training program teaches farmers the methods and management techniques to have the appropriate rate, timing, placement and source for fertilizer applications.

Nutrient management training to improve Lake Erie water quality

In less than one year, 6,586 growers and producers responsible for farming 1 million acres of Ohio farmland have gone through fertilizer applicator certification training developed and taught by Ohio State University Extension — in collaboration with the Ohio Department of Agriculture — as part of the university's efforts to continue to improve Ohio's water quality.

The training is designed to help farmers increase crop yields using less fertilizer more efficiently, thus reducing the potential for phosphorus runoff into the state's watersheds. The ultimate goal of the training is to keep nutrient runoff from fertilizers, especially phosphorus, out of Ohio's waters, said Greg LaBarge, an OSU Extension field specialist.

OSU Extension is also helping farmers in Ohio's Western Lake Erie Basin watershed develop nutrient management plans for their farms, which will help them identify fields with a high potential risk of phosphorus movement to nearby waters downstream.

Too much phosphorus can affect water quality in the basin, fueling the growth of harmful algal blooms.

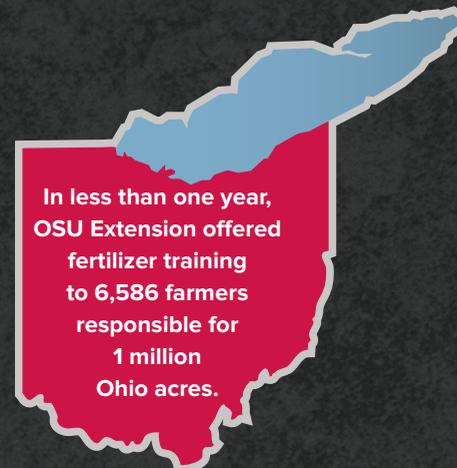
More: field2faucet.osu.edu

"The fertilizer applicator certification training that OSU Extension offers is a valuable resource to Ohio farmers. That so many farmers have taken the training is a testament to the fact that farmers care about water quality and the environment."

— **Jared McClarren**, a Fulton County farmer who grows crops and raises livestock on 400 acres



Lake Erie



In less than one year, OSU Extension offered fertilizer training to 6,586 farmers responsible for 1 million Ohio acres.

ESSENTIALS

- The certification training program was introduced in September 2014 to meet the educational needs of Ohio's new agricultural fertilization law, which requires certification of farmers who apply fertilizer to more than 50 acres.
- The training provides research-based tactics that keep nutrients available to crops in the field while increasing stewardship of nearby water resources.
- Under Ohio law, both growers and chemical nutrient applicators must become certified by Sept. 30, 2017.
- The training focuses on teaching farmers the appropriate rate, timing, placement and source for fertilizer applications.
- The program also offers guidance about the link between phosphorus, harmful algal blooms and agriculture.

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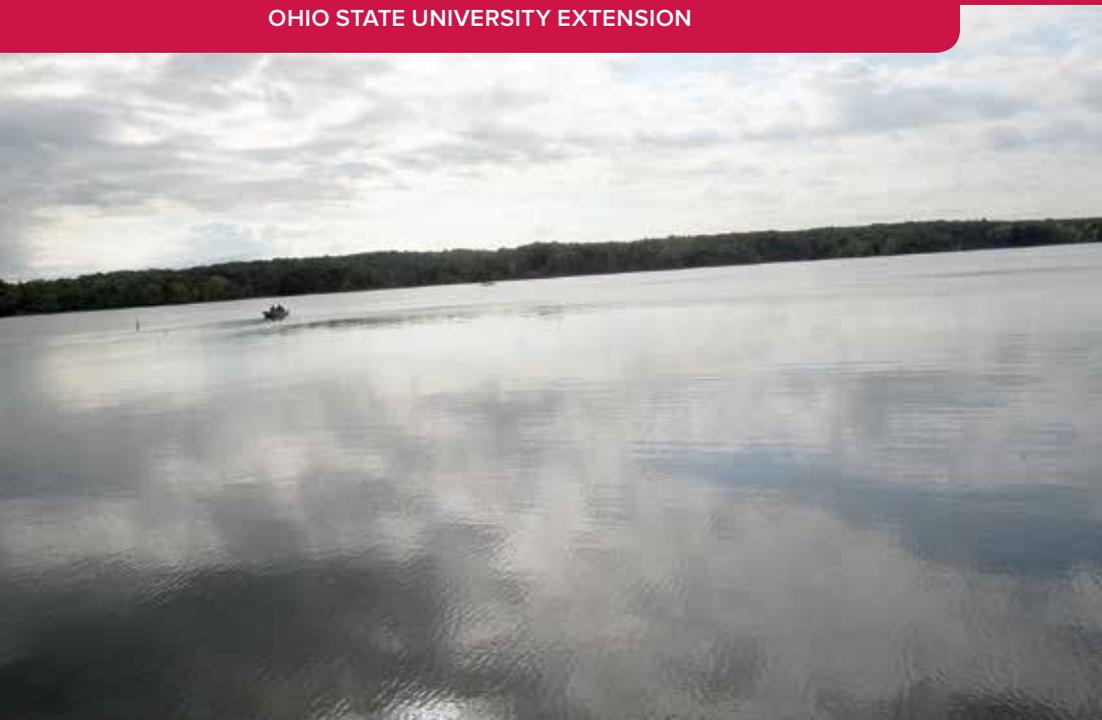
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Hoover Reservoir is a major source of water for Columbus. The 20 billion-gallon impoundment is in a rapidly growing area north of the city.

Working to protect Columbus' drinking water while also managing costs

High nitrate levels at a Columbus water plant recently led to a two-week, no-drink advisory for pregnant women and infants younger than 6 months old. Preventing such problems drives the city of Columbus' new, in-development Watershed Master Plan.

Consultancy CDM Smith leads the effort with help from, among others, specialists from Ohio State University Extension. Myra Moss and Joe Bonnell, plus faculty emeritus Bill Grunkemeyer, are helping the firm identify and prioritize agricultural activities in the Scioto River, Big Walnut Creek, and Alum Creek watersheds that could impact water reaching the city's water plants. The three specialists have unique expertise in water issues, sustainable planning and consensus building.

Protecting Columbus' watersheds "will help control treatment and reservoir operation costs and reduce risks in delivering safe drinking water," said CDM Smith's Julie McGill.

"The fewer contaminants entering the water plants," said Bonnell, Extension's watershed management program director, "the less technology — and money — required to remove those contaminants."

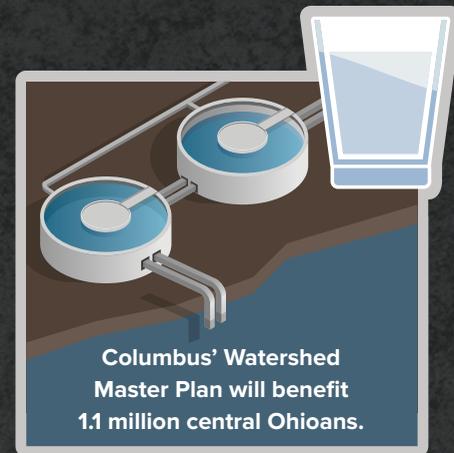
More: columbus.gov/watershed

"OSU Extension brings deep, unique experience in working with the agricultural community, developing comprehensive plans and delivering educational programs aimed at changing public behavior. This lets them reach out to farmers and other stakeholders with simple, straightforward dialogue that can change mindsets."

— **Julie McGill**, water resources engineer, CDM Smith



Julie McGill



ESSENTIALS

- Columbus' Watershed Master Plan stands to benefit 1.1 million central Ohioans by safeguarding their drinking water sources and spending their water revenues wisely.
- Columbus' main drinking water sources, the Scioto River and Big Walnut Creek, receive runoff from 1,200-plus square miles of land, 72 percent of which is agricultural, before reaching the city's Dublin Road and Hap Cremean water plants.
- Runoff of fertilizer from farmland can be a major source of nitrates in the Scioto River.
- Other challenges when treating Columbus' water include atrazine, a weed killer; *Cryptosporidium*, a protozoan sometimes in manure runoff and failing septic systems; and phosphorus from fertilizer, which can contribute to harmful algal blooms.

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THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES



Urban agriculture benefits Ohio by transforming neighborhoods through the production and distribution of food to cultivate a sense of community through food-related education and sustainable economic development.

Creating sustainable agriculture in urban food deserts

Across the street from an abandoned industrial site in an older, economically challenged neighborhood, formerly vacant lots have been fitted with raised garden beds and season-extending hoop houses to allow neighborhood residents to grow fresh produce year-round. The food will be donated to schools and residents in a food desert, which is an area that lacks grocery stores within walking distance.

In partnership with the city of Dayton, Ohio State University Extension supports the Vacant to Vibrant project, which offers city dwellers the ability to grow their own foods and the opportunity to become food entrepreneurs. The project allows participants access to fresh local foods, job training, economic security and neighborhood revitalization.

OSU Extension supports urban agriculture in all Ohio counties, in an effort to increase access to local foods by helping create community gardens that promote urban agriculture — such as the Edgemont Solar Garden in Dayton — as well as opportunities for vocational agricultural training. Other efforts include classes on growing and marketing produce and basic agricultural principles.

More: localfoods.osu.edu

“Thanks to OSU Extension, vacant lots have been transformed into a garden that will not only provide fresh produce to a neighborhood without a grocery store in walking distance, but also provide a source of income, hope and new life to the community.”

— **Pat Rickman**, president,
Southwest Priority Board/CDC



Pat Rickman

In Cuyahoga County, OSU Extension supports 239 community gardens that yield nearly \$3.1 million in produce annually.

ESSENTIALS

- According to Dayton Mayor Nan Whaley, urban agriculture, which allows cities to put vacant lots into use, creates opportunity for the future and can be a sustainable way to bring money into a community.
- In one year in Cuyahoga County, OSU Extension provided 33 urban agriculture workshops attended by 452 community members.
- OSU Extension also supports 239 Cleveland-area community gardens that yield nearly \$3.1 million in produce annually.
- According to the U.S. Census Bureau's Urbanized Area and Urban Cluster designations, 81 percent of Ohio's population is urban.
- More than 1,200 OSU Extension Master Gardener Volunteers in nine of Ohio's most populated counties provide more than 61,000 service hours annually to address local gardening needs.

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WE CONNECT WITH PEOPLE IN ALL STAGES OF LIFE.

We work with families and children, farmers and business owners, and community leaders and elected officials to build better lives, better businesses and better communities that make Ohio great. We do this through a focus on the following impact areas.

STRENGTHENING FAMILIES AND COMMUNITIES

We teach people how to apply research in their daily lives in order for them to make informed choices about everything from finances to healthy living to food safety.

PREPARING YOUTH FOR SUCCESS

Our 4-H youth development program delivers skills in leadership, communications, math, science and research to 216,000 young Ohioans. Ohio 4-H extends its reach through special in-school, after-school and summer programs.

ENHANCING AGRICULTURE AND THE ENVIRONMENT

Ohio's diverse agricultural, horticultural and forestry industries contribute \$105 billion to the state's economy every year. We assist with technology, marketing and educational support, protecting Ohio's position in the global marketplace. We also work to enhance the environment, water quality and natural resources in the state — balancing economic progress with environmental sustainability.

ADVANCING EMPLOYMENT AND INCOME OPPORTUNITIES

Our economic, small business and job development programs are tailored to local community needs in every county, whether metropolitan, rural or a combination of both.

OSU Extension's mission

Engaging people to strengthen their lives and communities through research-based educational programming

Locally based, jointly funded

We are the university's community-based research and outreach arm, delivering knowledge from The Ohio State University to every county in Ohio.

We are jointly funded through a line item in the State of Ohio's budget, through county funds and through the federal government. We do not receive funding from student tuition.

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