Food Security

Research and Extension ensure everyone has ample access to affordable, safe, nutritious food.

Invasive pests damage crops, costing U.S. agriculture an estimated $30 billion every year. Pest management research and Extension stabilize the food supply chain.

- Researchers and Extension specialists in **Oregon** developed cost-effective alternatives to glyphosate for herbicide-resistant Russian thistle control, protecting more than 30,000 acres of wheat and preventing over $1 million in yield losses so far. *Oregon State University Extension Service; funded by Other USDA Competitive.*
- New insecticides provide more effective control for spotted lanternfly in **Pennsylvania** grapes and orchards. *Pennsylvania Agricultural Experiment Station; funded by Hatch Capacity Funds.*
- Extension professionals in Arizona developed safer ways to manage insect pests in lettuce in **Arizona**. *University of Arizona Cooperative Extension; funded by Other USDA Competitive.*
- In **Idaho**, scientists created a new tool to help farmers choose the most cost-effective way to control nematodes in potatoes. *Idaho Agricultural Experiment Station; funded by Other USDA Competitive.*
- Cost-effective traps help control flies that invest valuable fruit crops in **New York**. *Cornell Cooperative Extension; funed by Smith-Lever (3b&c) Capacity Funds.*
- **Colorado** researchers developed resistant varieties and planting and weeding practices to control devastating pests of chile peppers and quinoa. *Colorado Agricultural Experiment Station; funded by Hatch Capacity Funds, AFRI, Other USDA Competitive.*

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The National Land-grant Impacts Database (NIDB) documents the impacts of land-grant universities' (LGU) research, education and Cooperative Extension. The featured projects and programs are supported by a variety of funding sources and partners. Much of this work is supported by USDA's National Institute of Food and Agriculture capacity and competitive grants programs. Capacity funding forms the foundation for the LGU's agricultural research and Extension system.

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USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

Research and Extension are vital to breeding higher-yielding, higher-quality food crop varieties.

- A consortium in **North Carolina** is responsible for some of the most successful cultivated varieties of peanuts, berries, tomatoes, wheat and other food crops, generating billions in economic impact. *North Carolina Agricultural Research Service; funded by Private Grants & Contracts, Hatch Capacity Funds.*
- **Georgia** scientists have developed more than 26 improved wheat varieties with high yield, resistance to major pests and desirable end use qualities. These varieties have been widely grown in Georgia and the southeastern U.S., generating millions of dollars in income for wheat growers and the milling and baking industry. *University of Georgia Agricultural Experiment Station; funded by Hatch Capacity Funds.*

Proactive efforts are key to keeping the New World screwworm threat manageable and protecting the livestock industry, food supply and economy.

- In **New Mexico**, survey findings will be used to tailor communication strategies so stakeholders are more likely to adopt preventative strategies. *New Mexico Agricultural Experiment Station; funded by State Appropriations.*
- In **Oklahoma**, Extension professionals delivered targeted education, developed diagnostic resources, and coordinated statewide response efforts. *Oklahoma Cooperative Extension Service; funded by Smith-Lever (3b&c) Capacity Funds, State Appropriations.*

Poultry diseases cause serious economic losses and affect producers' ability to meet growing demand. In particular, avian influenza resulted in the loss of over 150 million chickens from 2022 to 2025 in the U.S. Research and Extension help manage the poultry diseases across the country.

- A **multistate project** involving 11 land-grant universities has made significant advances in poultry genetics, including insights for breeding poultry resistant to heat stress, Newcastle disease virus and pathogens that cause foodborne illness. Project members also developed the vaccine for Marek's disease now used by all poultry companies and litter amendments to reduce the persistence of avian influenza. Even a conservative estimate of 1% improvement in poultry production attributed to this project represents $1.5 billion in added value. *University of Arkansas, Auburn University, University of California, Davis, University of Delaware, University of Georgia, University of Illinois, Iowa State University, University of Maryland, North Carolina State University, Ohio State University, West Virginia University; funded by Hatch Multistate Capacity Funds.*
- Timely alerts and resources from Extension professionals in **Indiana** helped commercial and small poultry flock producers track the spread of avian influenza and the best ways to manage it. *Purdue Extension; funded by Smith-Lever (3b&c) Capacity Funds.*
- Scientists in **Mississippi** developed a new test for the bacteria responsible for necrotic enteritis, a disease that causes $6 billion in losses in the poultry industry. Unlike previous tests, this can be administered onsite with minimal training and is fast and cost-effective. Keeping chickens healthy is key to meeting growing consumer demand. *Mississippi Agricultural & Forestry Experiment Station; funded by State Appropriations, Hatch Capacity Funds.*

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Food safety and quality are critical aspects of food security.

- After participating in the beef quality assurance certification programs offered by Extension, cattlemen in **Iowa** are producing a safer, higher quality protein for human consumption while adding an estimated $4.1 million in value to their operations. *Iowa State University Extension and Outreach; funded by Smith-Lever (3b&c) Capacity Funds, State Appropriations.*
- "Woody breast" impairs the texture and usability of chicken breast meat, costing the poultry industry an estimated $1 billion or more each year. Researchers in **Arkansas** combined hyperspectral imaging with artificial intelligence to develop a faster, more precise, less labor-intensive way to detect defective "woody breast" chicken meat. *Arkansas Agricultural Experiment Station; funded by AFRI, State Appropriations.*
- Since 2022, a program in **Oklahoma** has equipped over 500 cottage food producers with training to comply with state regulations, ensuring safe, sustainable home-based food businesses and resulting in over $5 million in direct income and $16.7 million in statewide economic impact. *Oklahoma Cooperative Extension Service; funded by State Appropriations, Other USDA Competitive.*
- Researchers in **Virginia** developed technology that detects critical food safety and quality parameters in seconds rather than days, helping seafood regulators and inspectors avoid processing delays and spoilage risk. This reduces losses for producers, protects food security and makes the state's seafood more competitive in national markets. *Virginia Agricultural Experiment Station; funded by Hatch Capacity Funds.*

PHOTO: University of Arkansas System Division of Agriculture

Pollination is essential to food security.

- A **multistate team** developed new breeding techniques, mite control tools and other strategies to protect the roughly two million honey bee colonies that pollinate nearly 100 crops across the U.S. In **Ohio** and other states, research helps conserve native bees that provide essential pollination to a variety of crops. Programs in **Nebraska**, **Puerto Rico** and other states are recruiting and training beekeepers, increasing pollination services and honey production. *Auburn University, University of Arkansas, University of California, Davis, University of California, Riverside, Central State University, Cornell University, University of Florida, University of Georgia, Iowa State University, Kansas State University, Purdue University, University of Massachusetts Amherst, Michigan State University, University of Minnesota, Mississippi State University, Montana State University, University of Nebraska, North Carolina State University, The Ohio State University, Oregon State University, Pennsylvania State University, Rutgers University, Texas A&M University, Washington State University; funded by Hatch Multistate Capacity Funds. University of Puerto Rico Agricultural Extension Service; funded by Smith-Lever (3b&c) Capacity Funds. Ohio Agricultural Research and Development Center; funded by AFRI, Other USDA Competitive.*

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Operating across the nation, Extension provides essential programs that expand communities' access to safe, healthy food.

- An input efficient, low-cost indoor vertical farming facility is improving access to fresh produce in southern **Nevada**. Partnerships with local farms, schools and food banks are strengthening local food systems. *Nevada Agricultural Experiment Station; funded by Integrated (Water Quality, Methyl Bromide Transition, Organic Transition, Crop Protection/Pest Mgt, RRDCs, Food and Ag Defense Initiative).*
- Extension professionals in **Connecticut** help urban farmers gain secure access to suitable land. This work provides a model for other densely populated regions seeking to integrate agriculture and improve food security. *University of Connecticut Extension; funded by Smith-Lever (3b&c) Capacity Funds.*
- Extension Master Gardener programs across the nation are increasing production of fresh, local produce. In **Indiana**, Master Gardeners logged over 174,000 hours valued at over $5.2 million and donated 37,795 pounds of produce from demonstration gardens to local food banks. *Purdue Extension; funded by Smith-Lever (3b&c) Capacity Funds.*
- A statewide program in **West Virginia** reached hundreds of thousands of community members, increased gardening knowledge, established new edible landscapes and seed libraries, and resulted in over 5,000 pounds of food harvested, strengthening household and community food resilience. *West Virginia University Extension Service; funded by Smith-Lever (3b&c) Capacity Funds, Other.*
- In **Rhode Island**, Extension programs trained volunteers to recover surplus food from farms, schools, food businesses and households, and redirect to those in need. The program donated over 231,000 pounds of food, diverted nearly 87,000 pounds from landfills. *Rhode Island Cooperative Extension; funded by Smith-Lever (3b&c) Capacity Funds.*
- In **Michigan**, trainings helped food pantries distinguish food quality from safety, reducing food waste and increasing safe food distribution. *Michigan State University Extension; funded by Smith-Lever (3b&c) Capacity Funds.*

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