

ENSURING A SAFE, SECURE & ABUNDANT FOOD SUPPLY

Nationwide, food supply systems are challenged by rapid population increases, environmental degradation, agricultural labor shortages, and food safety concerns. With continued support, Land-grant Universities can provide the interdisciplinary teams, systems-level research, technological innovation, and leadership to ensure a safe, secure, and abundant food supply.

RESEARCH PRIORITIES



Enhance food and livestock productivity and nutritional value



Prevent, detect, and control food safety hazards and bioterrorism agents



Create novel food sources



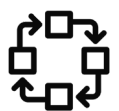
Reduce use of chemicals that can harm environmental and human health



Discover and enhance plant compounds that prevent diseases



Guide policy and regulation



Improve food systems, including processing and packaging



Develop strategies for communicating about innovations and policies

CAPACITY & RESOURCES



Institutions in all 50 states and many U.S. territories with research sites representing diverse ecosystems, communities, and food systems



State-of-the-art laboratories, greenhouses, and other research facilities and tools



Scientists, educators, students, and staff with expertise in all aspects of food systems



Impartial, peer-reviewed science, technology, and recommendations



Far-reaching Extension networks to work with and inform communities across the U.S.



Partnerships among farm and commodity groups, government agencies, and the private sector



SUCCESS STORIES

Research and Extension at America's Land-grant Universities have been key to ensuring a safe, secure, and abundant food supply. For example:

More than 60 governmental, academic, and private institutions adopted the **University of Georgia's SeqSero** tool, which shortens salmonella detection from days to minutes or seconds.

High voltage atmospheric cold plasma technology pioneered by **Iowa State, Purdue, and South Dakota State University** sterilizes foods without damaging food quality, unlike traditional methods that use heat, chemicals, or water.

Washington State University and the **Army Natick Research Center** developed microwave sterilization that provides a **3-year shelf life** for military rations. Other universities are developing packaged food or manned missions to Mars with the required **5-year shelf life**.

University of California, Davis, and Cornell University are using video games and simulations to engage students and professionals and allow them to explore real-world food safety scenarios and develop the skills they need to be successful.

A **multistate** project designed biodegradable packaging made from renewable resources and packaging that controls humidity and releases antimicrobials to protect food safety.

Over 60% of raspberry and strawberry sales in the **Pacific Northwest** are varieties developed by breeding programs at the region's Land-grant Universities. The **University of Arkansas** and the **University of Florida** developed blackberry and blueberry varieties that dominate acreage in the states and are widely used worldwide.

24 peanut varieties, including the 5 most widely grown in the **Southeast**, have been bred from a single peanut sample collected by Land-grant University researchers in 1952. The economic return for this sample is estimated at **\$200 million per year**.



In 2013, several growers in the **Pacific Northwest** unknowingly planted over **200 acres** with seed infected with potato virus Y. Timely virus identification by **Washington State University** and **University of Idaho** helped growers contain the virus, avoid major damage, and maintain contracts with processors.



Researchers at Land-grant Universities in **multiple states** coordinate genebanks that collect, analyze, and preserve plant samples. Diverse genebanks provide resources to develop new varieties, like higher yielding, heat-tolerant beans, to overcome production challenges and sustain or even expand crops.



Yolo County, California, grows a wide variety of crops, but **16%** of adults and **23%** of children struggle with food insecurity. The **University of California, Davis**, spearheaded a collaborative effort with local women to glean crop waste, preserve it, and then distribute it through the local food bank in consumer-friendly packaging. This effort is providing food during months when fresh produce is scarce.

The Grand Challenges are part of the *Science Roadmap for Food and Agriculture* developed by the Experiment Station Committee on Organization and Policy (ESCOP) to guide food and agricultural research. A unit of the Association of Public and Land-grant Universities, ESCOP governs the research activities of Land-grant Universities and Agricultural Experiment Stations. Borne out of the Hatch Act of 1887 and the Evans-Allen Act of 1977, these premier institutions are supported by USDA NIFA and by collaborations across federal, regional, state, nonprofits, and private institutions. For more information:

- escop.info
- aplu.org

To learn about the research needs, resources, and success stories for other Grand Challenge areas, see the rest of this series: escop.info/roadmap



Experiment Station
Committee on Organization
and Policy (ESCOP)