



United States Department of Agriculture

USDA - Agricultural Research Service – National Center for Agricultural Utilization Research (NCAUR)

NCAUR research is driven by the world's need to live sustainably by using renewable resources, and NCAUR expertise and research capacity in this arena is of increasing significance. It is important that the work of this lab continues and, as economic growth allows, continues to expand to meet the needs of the American public.

NCAUR's 270,000 sq. ft. research facility has benefitted from nearly \$60 million of renovations over the last decade. The Center houses nearly 100 Ph.D. researchers and another 125 research associates. This immense reservoir of scientific and intellectual capacity benefits Illinois and the United States, and positions the lab well to address an era of increased demands for technological knowledge and products created from renewable resources.

NCAUR produces information and technology that generates impacts in three broad areas:

- Protecting the environment and driving the economy by making renewable products and processes that are commercially viable by:
 - Developing methods for producing renewable fuels and chemicals
 - Identifying and developing new crops, such as pennycress for biodiesel
 - Creating methods for biological control of agricultural pests such as fungi, weeds and insects that decrease crop yields, and limit exports for American crops in world trade.
 - Producing higher value materials ranging from industrial lubricants to personal care, such as biodegradable plastics, edible films, printing inks, and pigments.

- Enabling food producers and processors to provide safe, secure and healthy foods and improve the consumer's quality of life by:
 - Developing methods to detect and control human and plant pathogens
 - Developing rapid technologies for identifying fungal toxins in grain
 - Creating low-calorie, cholesterol-fighting, fat replacement food ingredients (Oatrim/Nutrim/Z-Trim)
 - Creating a low glycemic index sweetener for foods for diabetics (Sucromalt)

- Generating fundamental research and knowledge to further the ability of NCAUR scientists and the entire research community to create practical applications and useful technology. For example:
 - More than 10,000 research papers from NCAUR have been published in scientific literature since the lab opened in 1940
 - An average of 170 research papers published annually during the last 5 years
 - More than 4,500 research papers from NCAUR have been cited a total of more than 55,000 times
 - More than 170 patents since 1980
 - Scientific expertise to support other government departments and agencies, including regulatory, law enforcement and biodefense, in accomplishing their missions.



Historical Achievements

- Method to mass produce penicillin
- Growth of soybeans as a commodity and export
- Dextran – blood volume extender used in IV solutions
- Xanthan – thickening agent widely used in salad dressings and other food items
- Breakfast cereals and paper additives from improved dry-milling processes for corn
- Corn-Soy-Milk blend used in the Food for Peace Program
- Super-Slurper – high absorbency material for disposable diapers, surgical dressings, etc.
- Five NCAUR researchers have been inducted into the ARS Science Hall of Fame
- NCAUR is designated an International Historic Chemical Landmark

Focus On NCAUR

NCAUR is the largest of the four regional USDA-ARS utilization research centers and is immensely successful in transferring technology from the laboratory to the marketplace. Researchers conduct 37 major research projects of national priority and engage in a wide variety of cooperative research agreements with private industry and academia.

Focus: Problem-solving Research

Bacterial Foodborne Pathogens & Mycology: Producing the information and molecular tools needed to enhance food safety and crop production in the U.S. and around the world.

Bioenergy: Developing bioproducts and bioprocesses for converting agricultural materials into biofuels.

Bio-Oils: Developing new technologies for using vegetable oils as renewable sources for value-added industrial products.

Crop Bioprotection: Developing new biological pest and disease control methods that reduce the use of potentially harmful chemical pesticides and herbicides.

Functional Foods: Developing dietary components, biologically active food ingredients, and new processing technologies that provide a human health benefit beyond basic nutrition.

Plant Polymer: Developing new, cost, and performance competitive bio-based products from agricultural commodities.

Renewable Products Technologies: Developing new technologies for converting renewable agricultural materials into high value chemicals, enzymes, and polymers.

Focus: Excellent Resources

- 270,000 total sq. ft.
- 170 individual laboratories
- 65,000 sq. ft. pilot plant
- The world renowned ARS Microbial Culture Collection of more than 90,000 bacteria and fungi
- Greenhouse field plots
- Nuclear Magnetic Resonance (NMR) facility for solids and liquids
- Genome sequencing and computational biology laboratories/facilities
- Extrusion and injection molding lab
- Materials testing lab
- Scanning electron microscope
- Gas chromatograph and liquid chromatograph mass spectrometer facility
- High pressure, supercritical fluid laboratory
- Fermenters: 1.5 liters to 100 liters pilot scale
- Reactors: 5 and 50-gallon pilot scale
- Food technology and sensory laboratories



Focus: Commercialization

The 65,000 sq. ft. NCAUR pilot plant provides a product development and production area within NCAUR that can function as a business incubator and add value to private sector collaborations. Legislative authority allows materials produced in this facility to be sold by the collaborator in order to demonstrate the market potential of NCAUR discoveries. Production efficiencies, reduced costs, added value, and new products have all resulted from collaborations with NCAUR.

Implementing private sector use of new technology is accelerated through a variety of collaborative relationships using patent licensing and specialized agreements (such as Confidentiality Agreements, Material Transfer Agreements, Cooperative Research and Development Agreements and others) to protect the intellectual property of those involved. More information on ARS technology transfer is available at <http://ott.ars.usda.gov>

For more information about opportunities with NCAUR, contact:

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