

USDA • ARS

NATIONAL CENTER FOR AGRICULTURAL UTILIZATION RESEARCH PILOT PLANT

From its beginning, NCAUR has worked directly with industry to achieve results of global significance, first and most notably to develop the method for the mass production of penicillin. The commitment to commercializing new technology continues today.

To facilitate technology transfer, NCAUR offers pilot plant scale-up for industrial products, biobased products / biofuels and food processing, along with the on-site expertise of more than 100 Ph.D. researchers from nearly a dozen different scientific disciplines. The result is product development and production capacity with the additional benefit of business incubator functionality.

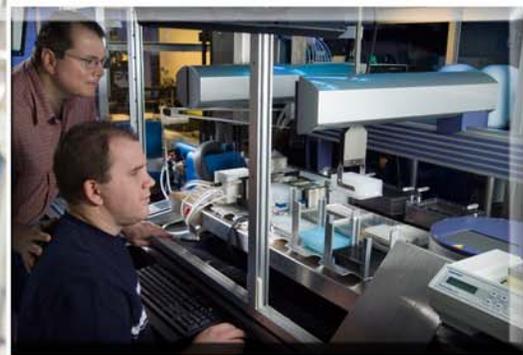
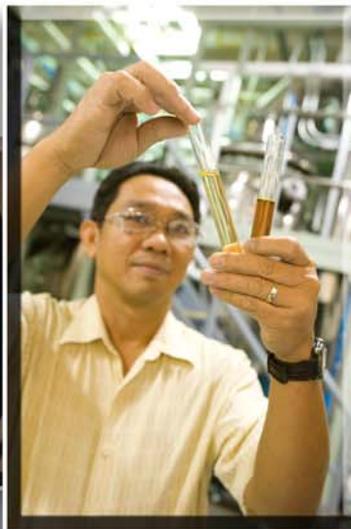
These assets are combined with legislative authority allowing materials produced in the pilot plant to be sold by the collaborator in order to prove market concept. The result is a unique and powerful capacity for partnership and success at NCAUR.

The Power of Partnering

Agreements between NCAUR and its industry, university, and agency partners lead to successful development of commercial production and formulation technologies.

Examples include:

- A new metalworking fluid derived from soybean oil rather than petroleum, providing performance benefits and lower cost
- Conductive polymers made from plant polysaccharides, such as starch and cellulose, that work as well as the petroleum based materials in the developmental pipeline
- Microbial agents that control a variety of pests, including Formosan subterranean termites; the aquatic weed hydrilla; Fusarium head blight of wheat and potato dry rot, late blight and sprouting
- New types of skin care additives attached to soybean oil and other natural oil molecules with anticipated uses in skin-, hair- and related personal-care products for health-conscious consumers
- A series of oat- and barley-based fat substitutes that are good for the heart, the most recent providing a “double-whammy” of reducing fat calories while at the same time working to reduce cholesterol





Food Processing Resources

Food processing research focuses on enhancing the performance of agricultural materials in existing applications and on developing new products to promote health using crops such as corn, soybeans, oats, barley and wheat. Equipment includes:

- Jet cooking lab featuring excess steam jet cookers capable of producing 30 gallons of liquid per batch at one gallon per minute
- Electric boiler producing clean steam generated from distilled water with no additives
- Vertical cutter mixer capable of blending liquids in batches up to 4 gallons each
- Steam-heated drum dryers capable of drying suitable materials at approximately .5 liter per minute
- Fully equipped test kitchen including a convection oven with capacity for 30 dozen cookies per batch or 12 1-lb. loaves of bread per batch or 4 20-lb. turkeys
- Sensory evaluation lab and test kitchen with odor and light-controlled booths for members of trained sensory panels



Chemical Processing Resources

Chemical processing research focuses on modifying the chemical and physical properties of soybean and other vegetable oils to develop improved quality and functionality; and on modifying bio-based materials such as polysaccharides and proteins from corn. Equipment includes:

- Werner & Pfleiderer ZSK-30 and Leistritz 18 mm co-rotating twin screw extruders with multi-port injection, feeding or venting capability; Brabender single screw extruder capable of producing pellets and 1/4" ribbons; Randcastle co-extrusion system for extruding 3 or 5 layer films
- Brabender and Haake torque rheometers
- Cincinnati Milacron injection molding machine with 78 ton clamping force
- Ultrafiltration device capable of accepting any suitably sized cartridge membrane
- 5 and 50-gallon reactors, filtering apparatus, reverse osmosis concentrators, chiller, membrane separation apparatus, dewatering screens and more
- Myers-15 distillation apparatus, high vacuum distillations and high pressure reactors
- Supercritical fluid extraction pilot plant
- Technochem 800 lb/day pilot scale oil refiner RBD
- Small production scale equipment for de-hulling, cleaning, screening, aspirating, grading and milling seeds, including Rototex cleaner, seed conditioner and 400 lb/hr. French press



Biological Processing Resources

Biological processing research focuses on metabolic engineering technologies to convert agricultural commodities such as corn & crop residues into biofuels and chemicals, enzymes and polymers and to develop natural biological pest control agents. Equipment includes:

- Benchtop and pilot plant fermenters (1-100 L scale fermenters)
- Ancillary equipment for recovering and drying microbial products such as batch and continuous centrifuges, fluidized bed, spray, tray and vacuum freeze dryers and a rotary drum vacuum filter
- Controlled environment and plant growth chambers
- Turnkey integrated robotic workcell laboratory automation for high throughput molecular screening



For more information about partnering opportunities at NCAUR contact:



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