

# Science Update

## Space Flight Didn't Crack Moth's Adaptive Armor

Not even a ride on the space shuttle disrupts the reproductive cycle of the gypsy moth. At least that's the preliminary finding from a joint study by ARS and the National Aeronautics and Space Administration. Last October, 8,000 moth eggs rocketed into space for 2 weeks aboard the shuttle Endeavour. ARS entomologist Robert Bell was seeking clues on how gravity, acceleration, weightlessness, and other factors might disrupt the diapause stage of the hardy, destructive forest pest. During diapause, the eggs stop developing and "hibernate" over winter. In spring, immature moths emerge from eggs and feed voraciously on leaves of oaks and many other trees. Endeavour's eggs hatched normally on their return, confirming that the insects are highly resistant to stress, says Bell. "Insects have a remarkable capacity to adapt to very diverse and extreme environmental conditions," he says. After all, they've had 300 million years to evolve genetic mechanisms to cope with climate changes and other stresses. *Robert A. Bell, USDA-ARS Insect Neurobiology and Hormone Laboratory, Beltsville, Maryland, phone (301) 504-8015.*

## EPA Okays Biofungicides From ARS Research

Early this year, the U.S. Environmental Protection Agency registered ASPIRE and BIO-SAVE-11, the first two postharvest biofungicides for the U.S. market. Both products are from technology developed by ARS and licensed to private industry. In the products, either a yeast or a bacterium serves as a natural control for rot-causing fungi. Ecogen Corp. of Longhorne, Pennsylvania, produces ASPIRE. Its

*Candida oliophila* yeast controls postharvest rot of apple and citrus. EcoScience Corp. of Worcester, Massachusetts, makes BIO-SAVE-11. It contains *Pseudomonas syringae*, a bacterium that fights storage rots of apple, pear, and citrus. *Charles L. Wilson and Wojciech J. Janisiewicz, USDA-ARS Appalachian Fruit Research Laboratory, Kearneysville, West Virginia, phone (304) 725-3451.*

## ARS Research Summaries on the Internet

The text of ARS' four-times-a-year compilation of research news can now be accessed via the Gopher server of the National Agricultural Library. The library became part of ARS during the recent USDA reorganization. Each issue of "Quarterly Report of Selected Research Projects" contains about sixty 100- to 200-word summaries. They are grouped by topic, such as human nutrition, crops, animals, biocontrol, and new products. The "Into the Marketplace" section highlights ARS patent licenses and cooperative R&D agreement (CRADA) with industry. To view or download the quarterly, point your Gopher client to [gopher.nalusda.gov](http://gopher.nalusda.gov). From the NAL Gopher's main menu, choose "Other Agricultural Publications." In the following menu, you can select specific issues and sections of the quarterly.

## Bacterial Sugars Taste Sweet to Industry

Quest International of Sarasota, Florida, and ARS have a CRADA to produce special dextrans—natural sugars—for food processing and industrial use. *Leuconostoc* bacteria make dextrans. These sugars might replace costly plant gums as binding agents, emulsifiers, and stabilizers. ARS scientists are breeding *Leu-*

*conostoc* strains in a hunt for new, useful dextrans. Quest will evaluate their commercial potential. One candidate may find use as an artificial, low-calorie sweetener. *Michael R. Smith, USDA-ARS Process Biotechnology Research Unit, Albany, California, phone (510) 559-5865.*

## Hessian Fly Could Meet Its Match in Resistant Wheat

Soft red winter wheat will soon have new resistance to its most damaging insect foe, Hessian fly. At least one fly biotype has adapted to survive on formerly resistant cultivars. Recently, however, scientists with ARS, Purdue University, and the University of Florida cooperated to develop five new resistant lines for the East and South. Breeders can use the lines to develop cultivars for farmers. The warm southeastern climate supports up to six generations of Hessian flies each year. *Roger Ratcliffe, USDA-ARS Insect and Weed Control Research Unit, West Lafayette, Indiana, phone (317) 494-4606.*

## "Spray-on" Bugs for Biocontrol

Under a CRADA, ARS and Smucker Manufacturing Co. of Harrisburg, Oregon, will develop a sprayer and adhesive to gently glue eggs of lacewings and other helpful insects onto plant leaves. Hungry young lacewings hatch from eggs to gobble pests such as aphids, whiteflies, leafhoppers, mites, and scales. An ARS scientist developed the technology. It offers a way to expand use of natural alternatives to chemical insecticides for agricultural and horticultural crops. *W. Louis Tedders, USDA-ARS Southeastern Fruit and Tree Nut Research Laboratory, Byron, Georgia, phone (912) 956-5656.*