Science Update

Convenience Food for Good Bugs

Liver and ground beef are two ingredients in the recipe of a new lab diet for mass-rearing pest-eating insects. ARS scientists are patenting the diet. It has been used to rear about a dozen different insects to adulthood. These include a native parasitic wasp *(Diapetimorpha introita)* and a predator, the spined soldier bug. Under a cooperative research and development agreement (CRADA), Predation, Inc., of Alachua, Florida, is evaluating the ARS diet for rearing a native lady beetle *(Coleomegilla maculata)* and two predatory mites. ARS scientists are refining the diet. For example, they want soldier bugs raised on it to lay more eggs than they do with the current formulation. They also want to come up with capsules—a few millimeters in diameter—to contain and store tiny diet servings. So, under a different CRADA, Analytical Research Systems, Inc., of Micanopy, Florida, is formulating new polymer coatings for encapsulating the diet. One requirement: An insect must be able to pierce the capsule to get at the food. With an encapsulated diet, commercial biocontrol companies would have technology for economically supplying massive numbers of beneficial insects to growers for use as an alternative to chemical insecticides. *Patrick D. Greany, Center for Medical, Agricultural, and Veterinary Entomology, Gainesville, Florida, phone (352) 374-5763, e-mail pgreany@nervm.nerdc.ufl.edu*

Keeping Cattle Cool

With cattle as with people, it's not just the heat, it's the humidity that often leads to daytime heat stress. An ARS-led study of feedlot cattle indicates the animals won't recover from daytime heat stress if a hot or muggy night follows. Researchers estimate a July 1995 heat wave in the midcentral United States cost the cattle industry around $28 million in animal deaths and reduced livestock performance. But the heat wave allowed them to take a closer look at how temperature and humidity were linked to the deaths. Using a Temperature-Humidity Index (THI), the scientists found strong links between losses of vulnerable animals and three or more successive 24-hour periods with daytime THI scores over 83 and nighttime scores over 74. The researchers are now examining whether feedlot cattle might benefit from smaller feed rations for a day or two before a predicted heat wave. Cattle generate body heat when they digest feed, so eating less may ease the animals' overall heat levels. *G. LeRoy Hahn, USDA-ARS Roman L. Hruska U.S. Meat Animal Research Center, Clay Center, Nebraska, phone (402) 762-4271, e-mail hahn@marcvm.marc.usda.gov*

Getting Texas Farmers the Fax on Crop Water Needs

A new weather station network uses early-morning faxes to reach farmers, news media, and other subscribers in the northern Texas High Plains. The 26-county region annually produces over $700 million worth of crops and $1.8 billion in livestock and livestock products. The network's information on plant water needs can save farmers thousands of dollars in water costs. Predictions include soil water evaporation and plant water use for irrigated crops. They're based on hourly data from a dozen weather stations and other information from ARS scientists. At least one newspaper uses the predictions to help urban readers know when to water the lawn. USDA's Natural Resources Conservation Service, water districts, and crop consultants use the network to advise farmers and others on water use and conservation. The network is operated by the Texas Agricultural Experiment Station at Amarillo. Corn and wheat farming associations helped build it. So did local water districts and the Texas Agricultural Extension Service. Farmers provide support including land, phone lines, and equipment for the weather stations. The network team plans to add information on diseases and pests. By 1999, farmers may be able to get fax alerts about western corn rootworms along with their morning coffee. The network complements a similar one in the southern Texas High Plains. *Terry Howell, USDA-ARS Water Management Research Unit, Bushland, Texas, phone (806) 356-5746, e-mail tahowell@ag.gov*

Will Cotton Fiber "Muscle Up"?

Biotech cotton that grows stronger fiber is the goal of a 5-year project of ARS researchers and Agracetus, a unit of Monsanto based in Middleton, Wisconsin. ARS scientists are evaluating some of Agracetus' transgenic cotton plants and crossing the most promising ones with other varieties. New, higher speed machines that weave cotton yarn require even stronger fiber to work best. So higher strength fabric could give the United States an edge in the global textile market. And since wrinkle-resistant, 100-percent cotton fabric has gone through a chemical treatment that can cut fiber strength up to 50 percent, starting with stronger fiber could help reduce this weakening of the cotton's "muscles." *O. Lloyd May, USDA-ARS Coastal Plains Soil, Water, and Plant Research Laboratory, Florence, South Carolina, phone (803) 669-5203, e-mail cotton@florence.ars.usda.gov*