Science Update

Conservation Day Is No. 1, Despite Weather

Despite cold, wind, and drizzle, the largest field day held at the ARS laboratory in Weslaco, Texas, took place March 26. ARS' research farm hosted about 300 farmers from the Lower Rio Grande Valley of south Texas and northern Mexico. Cotton, corn, and sorghum account for about half the typical annual $400 million value of all crops grown in the valley. But relatively few of the valley's growers use conservation tillage to grow these crops. Scientists hope the field day changed some minds. They showed how systems they've developed and tested since 1993 in Weslaco and at Mission, Texas, can increase net returns $30 to $50 an acre. Key to conservation tillage is leaving crop residue on the soil surface. But systems designed for the humid, temperate Midwest won't work in the semiarid, subtropical valley. The Weslaco scientists' systems are the first developed specifically for the region. They can increase net returns, reduce fuel and labor costs, conserve water, and cut wind and water erosion. Conservation tillage also has wide potential in northern Mexico. There, ARS scientists designed tests carried out by growers and the John Deere Company. ARS cosponsored the field day with the Texas Agricultural Extension Service. *Joe E. Bradford and James R. Smart, USDA-ARS Subtropical Agricultural Research Laboratory, Weslaco, Texas, phone (210) 969-4812.*

A First for Cattle Embryos

In February 1996, U.S. scientists imported the first cattle embryos from any foreign country where foot-and-mouth disease exists. This devastating disease hasn't broken out in U.S. herds since 1929. But it has prevented U.S. ranchers from easily obtaining potentially valuable cattle germplasm from countries where it does occur. From Venezuela, an ARS researcher brought 140 Romosinuano cattle embryos frozen in liquid nitrogen. He and colleagues implanted the embryos in cows serving as surrogate mothers. Anticipated delivery date is spring 1997. Romosinuanos possess winning genetic traits for combining with U.S. breeds. Southern producers need—and have—heat-tolerant and pest-resistant cattle. But quicker-maturing breeds would help cut feed costs, and Romosinuanos may combine all three traits better than domestic breeds. The Venezuelan embryos came from a pure line of Romosinuano, unlike embryos of an inbred herd imported from Costa Rica in 1990. The project took close international cooperation, including participation of Venezuelan Romosinuano breeders and veterinarians at the Central University of Venezuela at Maracay. In Venezuela, scientists quarantined and tested parent cattle—and washed embryos—to ensure all were free of foot-and-mouth disease. These and other precautions followed years of studies at USDA's Plum Island Animal Disease Center in Orient Point, New York. *Chad C. Chase, Jr., USDA-ARS Subtropical Agricultural Research Station, Brooksville, Florida, phone (352) 796-3385.*

License Issued for Multipurpose Extractor

ARS has issued a license to Applied Separations of Allentown, Pennsylvania, to commercialize a new tool with many potential food and industrial uses. These include isolating contaminants and components of foods and other products—and manufacturing improved products. ARS scientists jointly developed the multipurpose supercritical fluid extractor (SFE) under a cooperative research and development agreement with the Allentown firm. The company has made and sold about 100 SFE's around the world. Unlike most extraction methods, SFE uses harmless carbon dioxide gas to extract compounds, rather than potentially hazardous or toxic organic solvents. The U.S. Environmental Protection Agency has mandated that federal agencies and others reduce or eliminate use of such solvents in their laboratories. Among the new tool's potential uses: removing fats and residues of pesticides, nitrosamines, antibiotics, and other substances from meats and other foods. Applied Separations has also tested their SFE's for several pilot-plant applications. These include separating dyes, essential oils, and pharmaceuticals from plants; and trace-level cleaning of delicate electronic components. The instrument costs about $16,000. It will extract samples from 1 milliliter to 2 liters in volume. Within this range, industry users can examine feasibility of new applications from small-scale to pilot-plant levels. *Robert J. Maxwell, USDA-ARS Eastern Regional Research Center, Philadelphia, Pennsylvania, phone (215) 233-6433.*

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Chemist Robert Maxwell uses supercritical fluid extraction on a tissue sample. (K7302-1)