ScienceUpdate

Veggie Oils as Engine Lubricants

New fluids derived from vegetable oils have potential as base oils for making lubricants. Under a research agreement with Caterpillar, Inc., Peoria, Illinois, scientists are chemically modifying and testing the oils for improvements. Such modifications allow the biodegradable product to perform nearly as well as a synthetic one, but at lower cost.

Environmental concerns have created a high demand for biodegradable lubricants and hydraulic fluids. Yet, just 2 percent of hydraulic fluids used in bulldozers, tractors, and other heavy equipment are biodegradable. The vegetable base oils cost about 35 cents a pound, compared to 25 cents for a base of mineral oil and $1.50 for a base of synthetic esters. Caterpillar engineers are testing the performance of two of the ARS-developed base oils. *Sevim Z. Erhan, USDA-ARS Oil Chemicals Research Unit, Peoria, Illinois; phone (309) 681- 6531, e-mail erhansz@mail.ncaur.usda.gov.*

JACK DYKINGA (K3095-10)

A new ARS study on iron and zinc needs of expectant and nursing mothers and their babies will soon be under way.

Moms-To-Be Also Need Zinc

Expectant and nursing mothers are routinely prescribed therapeutic doses of iron—but not zinc. But research has shown that iron supplements may interfere with zinc uptake and use late in pregnancy and during the first 3 months of breast-feeding. Yet, these are the times when zinc is most needed for baby's growth and mother's milk production.

A new study is looking at healthy, nonsmoking, pregnant volunteers who plan to breast-feed their infants. They will report on the foods they eat and give biological specimens for testing. Some will reside briefly at a guesthouse and eat specially prepared meals. Researchers hope to learn more about a mother's and baby's needs for both iron and zinc. *Janet C. King, USDA-ARS Western Human Nutrition Research Center, Davis, California; phone (530) 752-5268, e-mail jking@whnrc.usda.gov.*

Raspberries the Color of Coho

Consumers may soon be seeing a new red raspberry in their local markets. Named "Coho" after the red-skinned salmon of the Pacific Northwest, the new variety will extend the availability of fresh raspberries by 7 to 10 days, compared to the current late-season standard, Tulameen.

Developed by crossing Lewis with other breeding lines, Coho was most extensively tested in Oregon. It should grow well in raspberry-growing areas with winter temperatures above 0°F. Researchers can obtain small amounts of Coho from the breeders, and growers will find plants at several Northwest nurseries. *Chad E. Finn, USDA-ARS Northwest Center for Small Fruit Research, Corvallis, Oregon; phone (541) 750-8759, e-mail finnc@bcc.orst.edu.*

Soybean Hulls To Filter Wastewater

The soybean's outer coat could become another high-volume, low-value agricultural waste product with high potential value. Each year, U.S. soy processing generates 10 to 15 billion pounds of hulls that are typically sold to animal feed supplement producers for around $40 a ton.

Rather than use the hulls as a feed ingredient, scientists want to give them an industrial use. One idea is to convert them into ion exchange resins for use in adsorbent filters to capture metals in solutions.

Jewelry-making, electroplating, and other industries generate waste water contaminated with metals. Most commercial ion exchange resins cost from $2 to $20 per pound, depending on whether they're synthetic or cellulose based. Researchers calculate that the cost of the soy-based resins would drop to 53 cents per pound, if processed at a rate of 22,000 pounds of hulls a day.

Best of all, trials with solutions containing cadmium, copper, lead, nickel, and zinc showed that the modified hulls did a slightly better job of capturing positively charged ion forms than commercial resins did. Now, a company in Minnesota is keenly interested in testing the soybean hull adsorbents. *Lynda H. Wartelle, Wayne E. Marshall, USDA-ARS Commodity Utilization Research Unit, New Orleans, Louisiana; phone (504) 286-4356, e-mail wartelle@srrc.ars.usda.gov, marshall@srrc.ars.usda.gov.*

Reducing Organics—Solvents, That Is

Some organic solvents used in processing agricultural commodities are toxic. Curbing their use would reduce the amount of toxins released into the environment—a goal of the U.S. Environmental Protection Agency.

Solvents like hexane are used to get enzymes to act as a catalyst for chemical reactions. Now, solutions called ionic liquids are substituting for solvents in research laboratories. At room temperature, they behave as saltlike fluids. And combining use of ionic liquids with supercritical carbon dioxide is an even more effective way to perform enzymatic reactions. A synergism makes the two environmentally friendly techniques a better processing method when used together. *Joseph A. Laszlo, USDA-ARS National Center for Agricultural Utilization Research, Peoria, Illinois; phone (309) 681-6322, e-mail laszloja@mail.ncaur.usda.gov.*