All Pollens Are Not Created Equal

Honey bees, like people, need variety in their diet. Sunflower pollen alone, for example, won't supply bees with enough protein, ARS scientists discovered. While flower nectar supplies the insects with sugars, pollen supplies protein as well as vitamins, minerals, and fats. But in a test, bees lived 48 to 65 percent longer with a canola pollen diet than with a sesame or sunflower pollen diet.

High sunflower yield calls for healthy, effective pollinators, and bees love sunflower pollen. But working in—and dining on pollen from—only the sunflower field will probably weaken the bees as a result of undernourishment. Sunflower growers can help the bees—and themselves. They can plant small areas of other crops such as canola near sunflower fields. They can also leave some weeds and wildflowers along field edges, beside ditches, or among rock outcroppings. Bees that work indoors—in greenhouses—run a similar risk of nutrient deficiency. To help, beekeepers can place protein supplements or high-protein pollen patties in the hive. *Justin O. Schmidt, USDA-ARS Carl Hayden Bee Research Center, Tucson, Arizona; phone (520) 670-6481, ext. 109, e-mail joschmid@u.arizona.edu.*

Colon Cells for Cancer Screening

Physicians could have a new, reliable early warning system for colorectal cancer within about 5 years. That new system would owe its origin to an ARS scientist's technique for isolating live colon cells from stool samples. Colon cancer accounts for some 14 percent of U.S. cancer deaths. It begins as abnormal growths, or polyps, 3 to 5 years before a malignancy appears. With a noninvasive screening technique, doctors could detect and remove polyps before they turn cancerous—and patients could correct any contributing dietary habits. The current noninvasive screening method checks for blood in fecal smears. But it's plagued with false positives and negatives. Plus, a "true" positive indicates an advanced tumor.

A different approach with potential is based on subtle changes in genes and surface proteins of colon cells. A few years ago, an ARS scientist developed the first method for isolating live, intact colon cells from the stool. Then, he and a scientist at Sinai Hospital in Baltimore, Maryland, found that CD44—a telltale marker on other types of cancer cells—also appears on isolated colon cells. Early this year, British researchers reported a strong correlation between the amount of DNA in these cells and the presence of tumors. More recently, Japanese researchers reported finding—on colon cells—variants of CD44 that may be sensitive indicators of precancerous conditions. *Padmanabhan P. Nair, USDA-ARS Beltsville Human Nutrition Research Center, Beltsville, Maryland; phone (301) 504-8145, e-mail nair@bhnrc.arsusda.gov.*

Potato Vine Silage Good for Cattle

Harvesting potato vines for silage to feed cattle can benefit the cattle, potato growers, and environment, says agricultural engineer Richard E. Muck at the U.S. Dairy Forage Research Center in Madison, Wisconsin. Potato vines are normally killed with herbicides about 2 weeks before potatoes are harvested. This practice prevents the leftover vines from providing a home to insects and plant diseases that could damage the next year's crop. Another benefit of vine harvest to growers is that potato skins "set" faster. The skin of the potato tuber is easily scuffed, peeled, or scraped unless it has time to thicken and harden after harvesting. This process actually accelerates if the vines are removed all at once, according to a plant pathologist at the University of Wisconsin.

Muck, who is with ARS, says, "Potato vines can be turned into silage in combination with other crops to produce a high-protein, low-fiber cattle feed. The savings for U.S. potato growers could be as much as $42 million annually." At least 80 percent of the 1.3 million U.S. potato acreage receives a single vine-killing herbicide application at a cost of $35 an acre. The other 20 percent may receive a double dose costing $50 an acre. Feeding the vines to animals will mean less herbicides in the environment and less out-of-pocket expenditure. Vines contain 85 to 90 percent water. So Muck says the best method for making silage from the watery vines is to mix them with drier crops such as chopped alfalfa hay, barley, and chopped whole-plant corn. *Richard E. Muck, USDA-ARS U.S. Dairy Forage Research Center, Madison, Wisconsin; phone (608) 264-5245, e-mail remuck@facstaff.wisc.edu.*

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A new 71-page catalog, "Systematic Collections of the Agricultural Research Service" (Misc. Pub. No. 1343), J.R. Lichtenfels, J.H. Kirkbride, Jr., and D.J. Chitwood, eds., details 12 ARS special collections. Free single copies are available from J. Ralph Lichtenfels, USDA-ARS, Bldg. 1180, 10300 Baltimore Ave., Beltsville, MD 20705-2350; phone (301) 504-8444. An electronic version will soon be available on the ARS Information Staff's home page at http://www.ars.usda.gov/is/np/