Rolling Out the Barrel Medic Genome

This close alfalfa relative, *Medicago truncatula*, may have genes that could be useful in improving that top forage crop, *M. sativa*. Funded by a 4-year National Science Foundation grant, the barrel medic genome project includes collaborators at the Universities of California-Davis and Minnesota and with the Noble Foundation.

Earlier work showed that many genetic markers for barrel medic can be used to find genes in alfalfa. It identified close to 30,000 of the expressed genes that are thought to make up barrel medic's genome. Scientists want to find genes that would give alfalfa better resistance to diseases, enhance its ability to fix nitrogen, and improve its nutritive quality and tolerance to stress.

New genomic techniques—and high-throughput techniques being developed—make it possible to compare thousands of genes at one time, to see which ones turn on or off in the presence of beneficial or disease-causing organisms. This should improve the chances of finding genes that play roles in more than one function. Researchers want to know whether the I.D. tags developed for barrel medic's genes will help them find similar or identical genes in alfalfa and possibly other crop legumes. *Deborah A. Samac and Carroll P. Vance, USDA-ARS Plant Science Unit, St. Paul, Minnesota; phone (612) 625-1243 [Samac], (612) 625-5715 [Vance], e-mail debbys@puccini.crl.umn.edu, vance004@tc.umn.edu.*

Toward Peril-Free Peanuts

Everyone with a peanut allergy will breathe a sigh of relief when scientists find a way to produce a safer nut. As it is, U.S. consumers eat more than 6 pounds of peanuts and peanut products each year. Legumes are a good source of protein, fiber, vitamin E, niacin, and oleic acid, with mostly unsaturated fat that lowers "bad" LDL-cholesterol. But for a small yet growing group, peanuts also induce allergic reaction. So scientists are searching for peanut cultivars that would be less allergenic than others. To do this, they're developing antibodies against three of the best-characterized peanut allergens, hoping to use them to screen the U.S. core peanut germplasm collection and determine the levels of these allergens in each cultivar. Those accessions with the lowest levels could then be crossbred to develop a hypoallergenic peanut plant.

The researchers, however, have noted that the roasting process itself causes a marked increase in peanuts' allergenic properties. They've observed specific structural, molecular, and biochemical changes that raw peanut proteins undergo during roasting that may contribute to increases in their allergenic properties. They theorize that perhaps it will be possible to adjust processing methods in a way that will not increase the allergenic properties. *Soheila J. Maleki and Si-Yin Chung, USDA-ARS Food Processing and Sensory Quality Research Unit, New Orleans, Louisiana; phone (504) 286-4590 [Maleki], (504) 286-4465 [Chung], e-mail sjmaleki@srrc.ars.usda.gov, sychung@srrc.ars.usda.gov.*

This Small Bean's a Big Performer

Rojo Chiquito is the first Central American market-class bean of this type bred for production on U.S. soils. The cultivar was developed with Washington State University. It differs in several ways from small, red, dry beans now grown, beginning with improved resistance to bean common mosaic viruses. It also grows upright, rather than prone, which helps reduce the incidence of sclerotinia white mold. This allows farmers to plant in ultra-narrow rows for increased yield.

The shiny seeds of Rojo Chiquito are smaller than those of other small, red, dry bean cultivars, but they stay firm and retain their dark-red color during canning and cooking. Though Rojo Chiquito grows best in the Pacific Northwest, field tests at 20 different U.S. locations showed this new bean to mature in 100 days and to yield an average of 2,061 pounds per acre. Primarily developed as an export crop to meet the demand for edible dry beans in Central America, this new variety provides an important niche market for U.S. bean growers. *Philip N. Miklas, USDA-ARS Vegetable and Forage Crops Production Research Unit, Prosser, Washington; phone (509) 786-9258, e-mail pmiklas@pars.usda.gov, or George L. Hosfield, USDA-ARS Sugarbeet and Bean Research Unit, East Lansing, Michigan; phone (517) 355-0110, e-mail hosfiel2@pilot.msu.edu.*

Vegetable Oil To Clean Up Groundwater

Scientists have found a way to use oil to clean water. Laboratory studies show that the injection of vegetable oil into the ground can be used to remediate contaminated aquifers. The oil stimulates microorganisms naturally present in the aquifer to thrive and accumulate. Then, as contaminated groundwater flows through the aquifer, these "hungry" microbes degrade polluting compounds. Environmental firms are adopting this idea to remove TCE (trichloroethylene) from groundwater. TCE is a colorless toxic liquid widely used as a solvent for dry cleaning and degreasing and has been found in groundwater beneath some military and commercial sites.

Pilot tests have been completed by an environmental consulting firm, and now full-scale evaluations are under way. In laboratory studies, vegetable oil has been successfully used to clean up groundwater contaminated with nitrogen fertilizer; the herbicide chlorate; and perchlorate, a component of rocket propellants. *William J. Hunter, USDA-ARS Soil-Plant Nutrient Research Laboratory, Fort Collins, Colorado; phone (970) 498-4208, e-mail jhunter@lamar.colostate.edu.*