Science Update

Tiny Grape Could Do Big Things

An amazing little grape called "Pixie" can be planted in a coffee mug and still produce grape clusters between 3 and 4 inches long! It needs only about a 50th of the space that a regular-size grapevine requires to produce mature fruit. Best of all, Pixie's fruit forms all year round—displaying flower buds, blooms, and immature and ripe fruit all at the same time! This feature will help accelerate research, by making possible year-round studies on flowers and berries at all stages of development.

But don't look for Pixie to show up in your grocery store. It's not meant for eating. The real value of its unusual gene-based traits will be for use in breeding and other research that may one day lead to new grape cultivars that growers and consumers will love. The concept of developing dwarf grape plants originated in Australia. Pixie was created, with the help of a University of California-Davis cooperator, by regenerating whole plants from embryogenic cells of Pinot Meunier grapes. *Peter S. Cousins, USDA-ARS Grape Genetics Research Unit, Geneva, New York; phone (315) 787-2340, e-mail peter.cousins@ars.usda.gov.*

Virus To Vanquish Fire Ants

Control of costly, destructive red imported fire ants, *Solenopsis invicta,* may be a little bit closer.

That's because cooperators are being sought to further develop and license a patented technology that relies on an ant-infecting virus called *Solenopsis invicta* virus-1, or SINV-1. Though still in its early research stages, SINV-1 is the first confirmed virus to be recovered from *S. invicta* and, in the lab, has proved to be both self-sustaining and transmissible.

Studies have shown that SINV-1 can eliminate a red imported fire ant colony within about 3 months of its introduction. So it seems to have potential for mass cultivation into a viable biopesticide product for controlling this damaging nuisance insect—especially if incorporated into an attractant bait. *Steven M. Valles, Imported Fire Ant and Household Insects Research Unit, USDA-ARS Center for Medical, Agricultural, and Veterinary Entomology, Gainesville, Florida; phone (352) 374-5834, e-mail steven.valles@ars.usda.gov.*

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Red imported fire ant, *Solenopsis invicta.*

Predicting Rift Valley Fever

In 1997-1998, hundreds of Kenyans died in an outbreak of Rift Valley fever, a viral disease that can lead to eye infection, brain inflammation, and severe hemorrhaging. In October 2006, a computer model that analyzes data from satellite images predicted the likelihood of another outbreak in parts of sub-Saharan Africa. The images showed concurrent elevated temperatures in the Pacific and Indian oceans and resultant fast-growing vegetation, which indicate weather conditions—such as heavy rains, elevated humidity, or cloud cover—favorable to mosquitoes and other insects that harbor and spread the fever. Thanks to the timely warning, authorities in Ethiopia, Kenya, Somalia, Tanzania, and Uganda knew to step up surveillance and begin insect-control measures.

So far, Rift Valley fever hasn't reached the United States, but the model's predictive ability can help authorities in the United States know when to increase vigilance to prevent its arrival here—or prevent outbreaks of other insect-carried diseases, such as malaria and cholera. The model was developed by the Department of Defense's Global Emerging Infections System and NASA's Goddard Space Flight Center, under the leadership of ARS. *Kenneth J. Linthicum, USDA-ARS Center for Medical, Agricultural, and Veterinary Entomology, Gainesville, Florida; phone (351) 374-5700, e-mail kenneth.linthicum@ars.usda.gov.*

Building Scab Resistance Into Wheat

Keeping one step ahead of fungi eager to take up residence in America's wheat fields is a perpetual challenge. Especially damaging is the fungus *Fusarium graminearum,* which causes *Fusarium* head blight disease, or scab. While current cultivars of durum—the wheat used to make pasta and semolina—contain little or no scab resistance, some wild relatives of wheat are highly resistant. Now, a new germplasm line of durum, dubbed DGE-1, has been developed that contains a pair of chromosomes from a wild grass, *Lophopyrum elongatum,* that impart scab resistance. They have been made a stable part of the DGE-1 genome, so the resistance will be passed on in the seed derived from it.

In screening tests under field and greenhouse conditions, DGE-1 showed, on average, 21 percent scab infection, compared to 80 percent in the parent durum cultivar Langdon. The plants grew to nearly 30 inches tall and matured 1-2 weeks later. While seed of DGE-1 is not yet ready for general cultivation by farmers, it has been released for further research and is already being provided to geneticists, breeders, and other scientists around the world who have requested it.

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