
**Root knot nematodes can cause galling and forking of carrot roots.**

was discovered in 1979 by McKenry and his UC Riverside colleagues. The scientists identified microorganisms that were protecting five Fresno County peach orchards from root knot nematodes. The fungus, *Dactylella oviparasitica,* was found to be attacking the pest's eggs.

"This fungus has now been noted in other field settings and in other regions involving other nematode species," McKenry says. "Research is slow and we still do not know how to correctly inoculate fields, but this fungus ranks as a top nematode control agent within nematode-infested soils and is naturally at work in the San Joaquin Valley."

Another method of nematode control is the development of resistant rootstocks. In 2003, McKenry's lab released two new grapevine rootstocks that possess broad nematode resistance.

These and other advancements are of particular interest to growers who plan to replant orchards or vineyards. When land that has not previously been used to cultivate crops is converted to agricultural use, nematodes that damage trees and vines are at a minimum. After years of hosting an orchard or vineyard, however, nematodes will have colonized and reproduced to levels that would put a new planting in grave danger. This is called the "replant problem." To address the complex issues associated with replanting, McKenry has made a 70-page report available for free on his nematode Web site.

**Annual crops.** Based at Kearney in the 1980s, Roberts established two experimental sites to study nematodes in annuals. The research sites were each inoculated with a distinct species of root knot nematode, the most problematic nematode on San Joaquin Valley commercial farms.

Over the last 20 years, Roberts and other scientists have identified genes that give plants natural nematode resistance, including in tomato, carrot, cotton, sugar beet and various dry grain beans. From the work at Kearney, there have been releases of several nematode-resistant black-eyed varieties, and breeder release lines of resistant carrots that are now being used by seed companies to develop commercial varieties.

Roberts has also been looking at a range of control options to avoid subjecting nematodes to selection pressure by repeatedly growing the resistant crops. He has found, for example, that crops susceptible to nematodes can be planted following some resistant crops without dramatically reducing yields. Cultural practices can also play a role, he says. "If you plant carrots at a cooler time of year, when nematodes are less active, you avoid some plant damage."

*— Jeannette Warnert*

**For more information**

Michael McKenry's nematode site:
www.uckac.edu/nematode

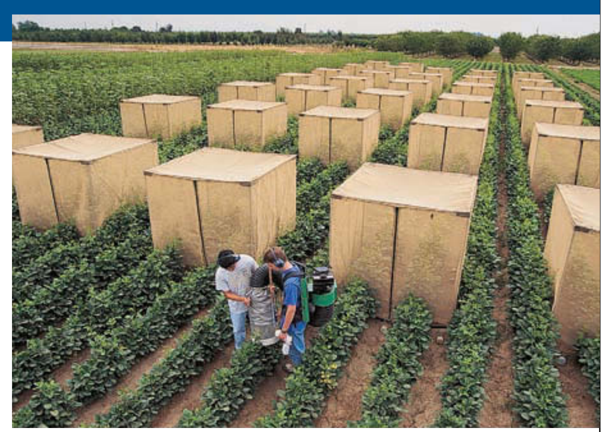
## Science brief

### Lygus study validates treatment thresholds

Lygus bugs *(Lygus hesperus)* are a common insect pest in the San Joaquin Valley, affecting everything from cotton to pistachios and many other commodities. Kearney-based IPM advisor Pete Goodell conducted a study in 1996 of how this pest affects blackeye beans and discovered that the timing of the infestation has more to do with subsequent damage than the sheer number of pests.

In brown exclusion cages, varying densities of Lygus bugs (0, 20, 60 and 120) were released before and after flowering. The bugs were allowed to feed for 2 weeks. Yield data was collected and evaluated to determine impacts on quantity and quality. Field assistants collected Lygus bugs from the bean field with a vacuum sampler.

"We found that the timing of the infestation has more impact on yield than numbers," Goodell says. "Beans are more sensitive to pressure from equivalent Lygus populations after flowering. Presumably, bean plants damaged early were able to compensate for any damage caused before bloom."




**Field assistants Tommy Koga and Jake Gregory sample for Lygus bugs in a blackeye bean plot with exclusion cages.**

This study, supported by the UC Statewide IPM Program and Dry Bean Council, showed that treatment thresholds developed for older varieties were still valid for newer varieties.

*— John Stumbos*