ARS Research Explains Link Between Stink Bug, Cotton Disease

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A mystery about a disease that can destroy up to 15 percent of a cotton crop in the southeastern United States has been solved by Agricultural Research Service (ARS) researchers. The work could save cotton crops and prevent unnecessary insecticide spraying.

In 1999, scientists reported an emerging seed rot disease that was discoloring seeds and darkening fibers in cotton bolls in the southeastern states, making the crops unmarketable. It quickly spread throughout the southeastern Cotton Belt.

To study the problem, plant pathologists Gino Medrano and Alois Bell of the ARS Cotton Pathology Research Unit, part of the Southern Plains Agricultural Research Center in College Station, Texas, focused on the southern green stink bug (Nezara viridula L.) as the disease-transmitting culprit.

In the greenhouse, they infected cotton bolls with suspect bacteria, using a needle to penetrate the boll wall and mimic a stink bug's bite. The results showed the needle created a pathway for the bacteria to enter the boll and damage it.

The researchers used a strain of the bacterium Pantoea agglomerans in the research, but other bacteria may also be involved in damaging cotton plants, according to the scientists.

In other tests, Medrano and entomologist Jesus Esquivel of the ARS Areawide Pest Management Research Unit in College Station showed why stink bugs sometimes – but not always – cause extensive damage in cotton fields. By infecting bolls at various stages, they found damage levels depend on when infections occur in the fruiting cycle and on how long infection is allowed to spread before harvest. Bolls infected three weeks after flowering are resistant and undamaged. Younger bolls remain susceptible.

Farmers often spray insecticide to combat stink bug infestations. But knowing mature bolls are immune to infections should help farmers decide when to spray. Medrano also is developing a test kit that will offer guidance by telling farmers if stink bugs in their fields are infested with the pathogens that cause the seed/boll rot.

A report on Medrano's work appeared in a recent issue of the Journal of Economic Entomology. Δ