

Managing Pecan Pests

S-1049 (2010-2015)

Insects & Mites Still a Problem for Pecan Farmers

U.S. farmers produce 75% of the world's pecan crop, but pecan orchards across the nation face serious pest problems that threaten crop yield. Aphids and mites destroy pecan tree leaves, which can keep trees from producing nuts for several seasons; pecan weevils, nut casebearers, stink bugs and hickory shuckworms eat away at or puncture the nuts, drastically decreasing the number of marketable nuts.

Over the years, research and Extension has provided pecan growers with highly effective pest management options, including traps, repellents, and chemical pesticides; however, pecan growers continue to demand improvements and new options, especially as pest populations develop resistance to certain pesticides and as environmental conditions change and new pests emerge. Furthermore, pesticide and labor costs are increasing rapidly and farmers are seeking more affordable alternatives. Some alternatives are not well understood, thus they are not used widely or effectively. For example, many farmers are still learning how to conserve beneficial insects and fungi that control pest species and how to sample soil and adjust fertilization practices so that trees and nuts are healthier and more resilient to pest damage. Farming practices to prevent pests from moving from adjacent crops to pecan trees also need to be fine-tuned. As practices change and new options become available, farmers need better educational resources to guide their pest management decisions.

Multistate Research Conserves Resources & Helps Pecan Farmers Protect against Pests

In 1972, researchers from land-grant universities across the U.S. formed Multistate Research Project S-1049 to coordinate studies about pecan pests and management options. Extensive, multidisciplinary collaboration and strong partnerships with industry organizations and government agencies have made it possible to address issues rapidly and provide new technology and recommendations to growers in a timely manner.

Experiments on over 300 acres of test fields across the U.S. have provided data on seasonal and regional variations in pest populations, optimal timing for pesticide applications, the efficacy of new control tactics, and the interactions between pest control methods and other farming practices (like applying fertilizers and planting ground cover or intercrops).

Based on field data, researchers have designed new and improved pest monitoring and control tactics. New monitoring protocols and tools, like using cards to collect honey dew drops and predict the number of aphids in the pecan tree canopy, have made it possible to address pest problems before they get out of hand, preventing serious and costly damage. Other newly developed control options include traps for pecan weevils; a pheromone-baited traps for stink bugs, hickory shuckworm, and pecan nut casebearer; fungal strains that kill or seriously disable pecan weevils; and new chemical pesticides. These options offer longer-term, more affordable pest management, and new chemical pesticides are less damaging to the natural enemies of pecan pests. Due to multistate involvement and direct engagement with farmers, researchers have been able to tweak pest control options to better suit the needs of farmers in



Pests like the pecan weevil (top left), brown stink bug (top right), and pecan nut casebearer (second row) and diseases like the kernel spot fungus (third row, left) cause serious damage to pecan nuts. Some pests, like the *Prionus* root borer, have larvae that feed on pecan tree tissues (third row, right). S-1049 researchers have designed and tested traps for many of these pests. In the bottom photo, a researcher sets up a stink bug trap, and a pecan nut casebearer trap hangs in the foreground. S-1049 researchers have also developed risk analysis protocols that pecan farmers have adopted to anticipate when pest infestations are likely to occur. Careful inspections for eggs and larvae reveal whether or not pesticides should be applied. Timely treatments only when needed help farmers save money and reduce unintended harm to natural enemies of pests and insects that are beneficial to pecan trees.

different growing regions. Furthermore, farmers do not have to worry as much about pests developing resistance to these new control tactics.

Working with pecan farmers, producer organizations, the S-1049 group developed the Pecan Integrated Pest Management Pest Information Platform for Extension and Education (Pecan ipmPIPE) to familiarize users with pecan production, pest biology, and pest management tactics. The website contains links to news, pest alerts, pecan pest literature, and educational videos. Users can also search through the labels of currently registered pesticides or use weather-based risk assessment models and interactive budgeting tools. The site is used by hundreds of pecan farmers, who estimate the value of this easily accessible, real-time information at three million dollars per year. Members of S-1049 have also fostered the training and education of numerous students, amassing a cadre of future scientists, educators, farmers, and pest management experts.

As a result of these considerable research and Extension efforts, pecan growers across the U.S. have been able to integrate an array of pest monitoring and control tactics with their production practices. Using fewer, but more effective pest control treatments has reduced growers' costs and risks of harm to human health. In Texas alone, about 50% of pecan farmers have readily adopted new technology. As a result, pesticide usage is about 192,000 kilograms per year less than in 1980 with a cost savings of \$4.4 million per year for these producers. Applying just enough pesticide only when and where needed has also helped minimize risks to human health and unintended damage to the environment, including organisms that benefits pecans.



Pecan orchards all across the U.S. are threatened by insect pests. *Prionus* root borer larvae chew deep furrows in pecan tree roots, severely impairing the tree's ability to take up water and nutrients. S-1049 researchers have developed traps (like the one hanging from the tree in the photo above) that are baited with pheromones to attract and capture these beetles.

Want to know more?

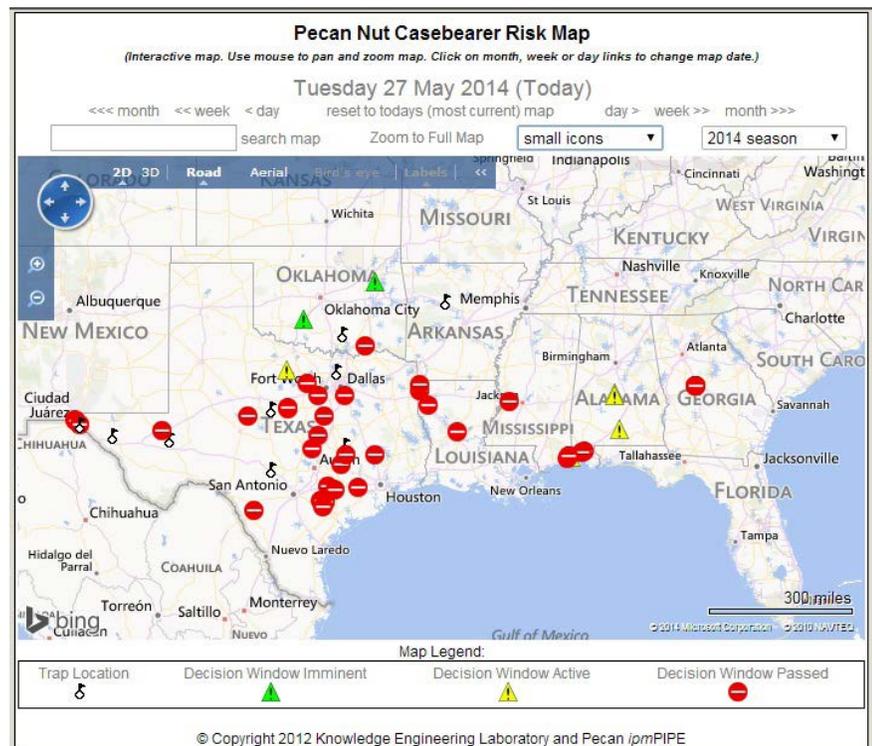
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List of Participating Institutions:

- Auburn University
- Kansas State University
- Louisiana State University
- New Mexico State University
- Oklahoma State University
- Texas A&M University
- Texas A&M AgriLife
- University of Arkansas
- University of Florida
- University of Georgia
- University of Missouri
- USDA-ARS, Southeastern Fruit and Tree Nut Research Lab
- The Samuel Roberts Noble Foundation
- Arkansas Pecan Growers Association
- Louisiana Pecan Growers Association
- Northern Nut Growers Association
- Oklahoma Pecan Growers Association
- Southeastern Pecan Growers Association
- Texas Pecan Growers Association
- Western Pecan Growers Association

This Impact Summary was compiled and designed by Sara Delheimer.



Interactive maps available on the Pecan ipmPIPE show the risk of pest outbreaks. Icons indicate trap locations, level of infestation, when and how to determine if management is needed, and which strategies to use.