



ADDRESSING Invasive Species Issues in Georgia

Modern transportation makes it possible for insects, fungal spores, seeds or numerous other invasives to move from their native lands to the U.S. in just hours. The U.S. government spends hundreds of millions of dollars to keep out unwanted plants and animals, but the odds are against us.

From herbicide resistant pigweed to Asiatic soybean rust and boll weevils to kudzu, invasive species are a prevalent and persistent problem in Georgia. Fighting these invasives costs farmers, local governments and the state millions each year.

The UGA College of Agricultural and Environmental Sciences is working to combat this problem from all angles. Here are a few examples of what we are doing to prevent, eliminate and control invasive species in Georgia.

Biologically controlling fire ants

Pseudacteon phorid flies have been periodically released in Georgia by **UGA entomologists** and in neighboring states to aid in the natural control of the imported fire ant. These flies parasitize fire ant workers, causing fire ant colonies to decrease in size and density.

These release efforts have resulted in the successful establishment of three species of Pseudacteon flies in Georgia; at least one species of these flies can be found in every Georgia county. Successful establishment of these biological control agents in Georgia adds to the arsenal of control tactics for the invasive imported fire ant. This will not be a definitive cure for the fire ant, but adds a biological challenge to the success of these invasive pests.

Determining plant resistance to kudzu bugs

Invasive kudzu bugs were first detected in Georgia in 2009. Severe infestations in soybean crops started in central Georgia in 2010 and have spread throughout most of the Southeast. Yield loss of over 50 percent has occurred in research plots, with losses of 15 to 30 percent common.

A collaborative research effort between the **UGA departments of entomology and crop and soil sciences** was initiated to evaluate resistance to kudzu bugs in soybeans. The research team included a soybean breeder, a molecular biologist and an entomologist.

Soybean breeding efforts have resulted in the identification of resistance to kudzu bugs. Certain genes that were previously identified as resistant to native insect pests of soybeans also have resistance to kudzu bugs.

Field tests showed an increase in yield with soybeans possessing kudzu bug resistance. Therefore, using such cultivars could increase profits for farmers, while resulting in reduced need for pesticides in the environment.

Increasing genetic variability of plants

Incorporating native plant species into the landscape dramatically reduces the threat of introduction of invasive plants into the natural environment. Use of native plants in landscapes is important for protecting biodiversity and our natural ecosystems. New cultivars of easy-to-propagate, adaptable and attractive plants are needed for landscapes.

Spigelia (Pinkroot) is an attractive, native herbaceous perennial. A **UGA horticulture study** assessed the genetic variability of native populations of *S. marilandica* and *S. gentianoides*. Genetic variability identified in native populations of Spigelia, combined with results from propagation studies and morphological characteristics, is guiding the scientists' crosses to develop new cultivars of this native species. These cultivars will help fill a need for additional native plant species that are suitable for landscape use.



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Detection of a new, invasive insect pest

The European pepper moth, *Duponchelia fovealis* Zeller, is a new, invasive moth and butterfly pest of vegetables (mainly peppers) and greenhouse ornamental crops in Georgia. The larvae of European pepper moths cause damage to the plant by boring into the stem and fruit, causing the host plant to wilt.

UGA entomology surveys show that it can be found as far north as Oconee County and is present in high numbers in Grady County, where there is extensive pepper production. This pest has already spread through Florida.

A report has been submitted to the Georgia Fruit and Vegetable Growers Association on both the survey results. One control study suggests that the insecticide spinosad might provide some control. At the current time, the problem is one of contamination in potted plants in ornamental nurseries.

Diagnosing household pests

Homeowners are sometimes concerned about the various pests in and around their homes. **UGA Cooperative Extension staff** provides Georgians an opportunity to bring in samples to assess potential damage and provide an identification and recommendation for management if needed.

The **Homeowner Insect and Weed Diagnostics Lab** provides these services to Georgia Extension agents for homeowner arthropod and weed samples. It also provides confirmation for arthropods such as termites and bed bugs, which may require a more extensive treatment, and for which a homeowner may wish to be sure about before proceeding.

About 250 to 400 arthropod samples are identified annually through physical samples, Distance Diagnostics through Digital Imaging and photographs sent via e-mail. Homeowner lawn weeds make up an additional 25 to 50 identifications and recommendations.

Additionally, the lab provides an avenue to assess potential new pest threats and invasive species. Since multiple county agents may send new or formerly unknown pests in for identification to this central location, a potential alert can be observed for new pest trends, which might otherwise go unnoticed from just one county office.

Managing glyphosate-resistant Palmer amaranth

Glyphosate-resistant Palmer amaranth poses serious ramifications for future cotton production as management costs exceed \$110 million per year. The pest has also forced some growers away from conservation tillage. Rapid spread of resistance by seed and wind-blown pollen is occurring in this species. Currently, there are no economically effective management options to control this pest in cotton.

Since 2005, **UGA crop and soil scientists** have conducted more than 500 research experiments to develop the most effective management systems available. Additionally, they have made reintroducing conservation tillage practices in Georgia cotton a priority since 2010.

These cooperative efforts have helped implement the most effective herbicide systems available on 95% of the cotton produced in Georgia. Researchers have noted that integrating a heavy, rye cover crop residue into a cotton production system could be used to effectively reduce the emergence of Palmer amaranth, thereby improving control and allowing growers to return to conservation tillage.

A cooperative group including members from UGA, the Natural Resources Conservation Service, the U.S. Department of Agriculture, and the staffs of Senator Chambliss, Congressman Kingston and Congressman Bishop have developed a pilot **Palmer amaranth management program** using heavy rye cover crops. This program provided \$1.1 million directly to growers to evaluate the rye cover crop system and its potential for future adoption.

For more information visit the Making an Impact website at impact.caes.uga.edu.