

Researchers use 'banker plants' to help battle whitefly pests

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ARS entomologist Cindy L. McKenzie has found that growing "banker plants"—plants that serve as a repository for insect predators and parasitoids that control pests on cash crops—can improve the effectiveness of such biocontrols.

A U.S. Department of Agriculture (USDA) scientist is showing growers how to combat whiteflies and other crop pests by using plants as storehouses for predatory insects that can migrate to cash crops and feed on the pests attacking those crops.

Cindy L. McKenzie, an entomologist in the Agricultural Research Service (ARS) Subtropical Insects Research Unit at Fort Pierce, Fla., has done extensive work showing how papaya, corn and ornamental peppers can serve as "banker plants" for a range of insect parasitoids and [predators](#). ARS is USDA's principal intramural scientific research agency, and this research supports the USDA priority of promoting

international food security.

Banker plants are considered environmentally friendly because they reduce insecticide use and offer a low-cost, self-perpetuating alternative. The predators eat what they find on the banker plants and then disperse to find targeted pests on cash crops. Before they leave the banker plants, most of the predators will lay eggs on them, which extends the effect into subsequent generations. Lower [pesticide use](#) also means pests like [spider mites](#), thrips, and whiteflies are less likely to develop resistance to the pesticides.

Using banker plants is a balancing act. Researchers must select not only the insect predators themselves, but also alternative prey that will keep the predators fed, but won't damage the cash crops. They also need banker plants and predators that will not host or spread diseases to the cash crops.

In a study designed for Florida's greenhouse poinsettia operations, McKenzie worked with entomologist Lance S. Osborne and postdoctoral researcher Yingfang Xiao, both at the University of Florida Mid-Florida Research and Education Center in Apopka. They chose papaya (*Carica papaya*) for their banker plant, and the tiny non-stinging wasp *Encarsia sophia* as the predator. The larvae of *E. sophia* feed on the silverleaf whitefly (*Bemisia tabaci*), the targeted pest. *E. sophia* is native to Florida and poses no threat to the state's habitats.

In one set of experiments, they forced the wasps to eat the targeted silverleaf whitefly pest to make sure the wasps would control it. In another, they gave the wasps a choice between the papaya whitefly they supplied as a food source and the targeted silverleaf whitefly they want to eradicate. The results, published in *Biological Control*, show that *E. sophia* has an appetite for both the alternative food source and the silverleaf whitefly, and that it effectively wipes out any silverleaf

whiteflies on crops near the banker plants. The system is now being tested in commercial greenhouses.

The researchers have also shown that corn can serve as a banker plant for a gall midge that controls the two-spotted spider mite, and they are studying whether ornamental peppers can bank a predatory mite, *Amblyseius swirskii*, which is effective at controlling whiteflies and [thrips](#). Results so far are extremely promising, and the concept is catching on among growers.

More information: [Read more](#) about this research in the September 2012 issue of Agricultural Research magazine.

Provided by United States Department of Agriculture

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