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Biological control

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Close up of Old World climbing fern.
COURTESY/KEVIN MAIN

VENUS — You may have seen it along the roadside or even on your own property, the climbing

vine known as Old World climbing fern (Lygodium microphyllum) that quickly overtakes native vegetation. First introduced to Florida as an ornamental vine around the turn of the 20th century, Old World climbing fern is native to Australia and was first observed to have become established in 1965. It invades a suite of habitats, including tree islands in the Everglades, cypress swamps, pastures and flatwoods, making many of Florida's natural areas and working lands potential targets. It is now one of Florida's most invasive plant species.

Removing Old World climbing fern is easier said than done. Herbicide application temporarily kills the aboveground vegetation, however the plant can regrow from its belowground root system in as little as six months. At Archbold, Old World climbing fern can be found in most of the forested wetlands. According to Land Manager Kevin Main, "Even with persistent control efforts, Old World climbing fern, a fern that grows like a vine climbing trees and shrubs, can be near-impossible to eradicate. We have treated populations of climbing fern with herbicides for many years, and follow-up treatments are always necessary."

Despite it being difficult to eradicate, there may be hope to control it, thanks to a few tiny creates and an approach called 'Biological Control.'

Biological control, or controlling a specific plant or animal with another, offers a long-term, sustainable solution to managing invasive plants like Old World climbing fern. The goal of biological control is to reduce the invasive plant to levels where management is minimal, but not to necessarily eradicate the plant. To do this, biologists seek out specialist herbivores, typically insect plant eaters, from the geographical range where the plant originated. These herbivores are selected because they feed on the invasive plant species and nothing else. Given that there were early mistakes with biological control across the world that often caused more problems, insect

species that are deemed specialists for biological control nowadays go through a lengthy regulatory approval process before they can be released in the U.S.

“Biological control is a safe, sustainable tool for managing invasive plants,” says Dr. Aaron David, the program director of Plant Ecology at Archbold. “Controlling invasive plants is a daunting task, so by letting the plant’s natural herbivores do some of the work for us, we can hope to achieve a long-term practical and cost effective solution.”

There are two approved, established biological control agents for Old World climbing fern – the Lygodium brown moth and the Lygodium mite. The moth’s larvae can cause widespread ‘brownouts’ when feeding on the aboveground leaves and stems, and the mite can mangle the growing tips of the vine and slow the plant’s growth. Archbold partners with the US Department of Agriculture’s Agricultural Research Service’s Invasive Plant Research Laboratory in Fort Lauderdale to release these insects on the Archbold property.

“These biological control agents can cause impressive levels of damage to Old World climbing fern, and we are in the process of evaluating just how effective they are,” says David. “It’s important to keep in mind that biological control is no silver bullet that automatically controls the plant, but instead is often most effective when used with other management activities such as herbicide treatment or fire.”

David added, “Biological control is one tool of many that we can deploy to help curb invasive species.”