

U.S. Forest Service Pacific Southwest Research Station

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HAWAII-HILO

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Insect Release Proposed To Control Exotic Strawberry Guava

HILO—U.S. Forest Service scientists with the Institute of Pacific Islands Forestry have submitted a proposal to release a Brazilian insect to control the spread of strawberry guava, a South American tree that has invaded and degraded native Hawaiian ecosystems since it was introduced in 1825 as a garden plant.

The scientists are working in collaboration with the Hawaii Department of Land and Natural Resources, and Hawaii Department of Agriculture, agencies responsible for issuing permits authorizing release of the insect on Hawaiian Islands. Initial release of the insect is proposed for this summer in the Ola'a Forest Reserve on the Big Island.

Land managers are particularly concerned about the plant because it has potential to invade nearly half the state's land area, forming dense thickets that crowd endangered native species and impede access to residential property. Past control methods have been limited to removal by hand, herbicides and bulldozers.

Strawberry guava also affects Hawaiian cultural practitioners who can no longer collect native plants once found in abundance in forests. In addition, it hosts non-native fruit flies that have cost the state billions of dollars in lost agricultural revenue.

Institute of Pacific Islands Forestry scientists were tasked with finding a biocontrol agent for strawberry guava to protect remaining native ecosystems, improve control of fruit flies and reduce dependence on chemical herbicides. Biocontrol agents in Hawaii have been used for more than a century, including for control of prickly pear cactus, lantana, banana poka and ivy gourd.

Non-native plants became invasive in Hawaii because they escaped the animals, insects and diseases that naturally kept them in check so the scientists traveled to Brazil where insects evolved to prey specifically on the tree.

Field research yielded the insect *Tectococcus ovatus*, or the Brazilian scale, which hatches nymphs that settle on strawberry guava leaves, inducing the plant to build a bubble-like gall to enclose it. The plant's vigor is reduced and it stops producing fruit, decreasing its spread over a period of years. The insect does not kill the plant outright.

Observations in Brazil that began in 1993 and testing at the Hawaii Volcanoes National Park Quarantine Facility the past six years have shown the insect is highly host-specific and will only attack strawberry guava, not common guava or other members of the plant's family in Hawaii.

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Strawberry guava

**Remaining
native trees**



**Bird's eye view of a typical 50-acre strawberry guava invasion
in Wao Kele o Puna Reserve**



**Ground view of strawberry guava
thicket in Ola'a Forest Reserve**