



Biological Control Release of *Tectococcus ovatus*, a Gall-forming Scale Insect to Aid in the Control of Strawberry Guava (*Psidium cattleianum*)

Strawberry guava

- Strawberry guava was introduced to yards and gardens of Hawai‘i in 1825. Since then, it has spread into moist and wet forests statewide. Strawberry guava is killing and replacing native forests by forming dense, single-species thickets.
- The Carnegie Airborne Observatory has worked for the past several years to aerially map what remains of native Hawaiian forests. “We have documented what is happening across many thousands of acres, and it is utterly clear that strawberry guava is among the worst invasive plants in the State,” (statement from Dr. Gregory Asner, Department of Global Ecology, Carnegie Airborne Observatory, Stanford).

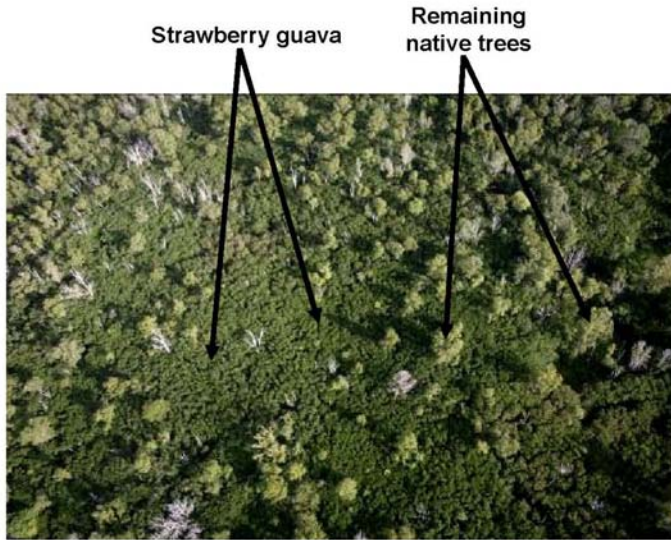
Biocontrol in General

- Protocol for biocontrol research and testing has improved vastly and cannot be compared to the careless and unregulated introduction of mongooses in the 1880’s. Since 1975, a total of 51 biocontrol species have been introduced to Hawai‘i after thorough testing — none have switched hosts to non-target species, and none have resulted in the eradication of their host.
- Biocontrol is a gradual process that can reduce the abundance of a pest, but does not eradicate it.
- A lot of time and effort is spent testing to see if the biocontrol species will switch hosts to closely-related species and more distant relatives. Biocontrol species are only released when testing shows that the species does NOT switch hosts, even when denied their preferred host. A “fast track” biocontrol project could take 4 years of research, but usually takes much longer.
- Where biocontrol species succeed in controlling or reducing prey (host) populations, the biocontrol species population also levels off or declines accordingly.

Biocontrol insect to control the spread of strawberry guava

- The biocontrol selected and tested for release is a scale insect. The newly-hatched nymphs crawl to young strawberry guava leaves, triggering the plant to form tissue around the nymph. These tissue lumps are called “galls”, and they reduce plant vigor by diverting resources normally used for plant growth and reproduction. Strawberry guava is the only plant in Hawai‘i that this insect is able to feed and make galls on.
- Decreased plant vigor will slow the spread of this plant, which will allow koa, ‘ōhi‘a and other native forest plants to survive and better compete for space, sunlight, and water.
- Decreased plant vigor will also decrease the number of seeds produced. This will allow land managers to achieve better control with chemical and mechanical techniques.
- Scientists have studied this insect for approximately 15 years to understand its biology and ensure that it will not attack other species. In 15 years of testing, it has not killed strawberry guava plants and has never attacked non-target plants of concern in Hawai‘i.

- Testing of this biocontrol insect for strawberry guava was reviewed and accepted by scientific panels administered by the Hawai'i Department of Agriculture (HDOA), and a federal Environmental Assessment was conducted. After regulatory reviews and public comment, permits for release of the insect were issued in April 2008 by HDOA and the USDA Animal and Plant Health Inspection Service.



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