Outreach Challenges for Biological Control in Hawaii

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Abstract

Public understanding of Hawaii’s use of biocontrol is limited. This can create problems when support for releases is sought. Release of a strawberry guava (Psidium cattleianum Sabine) enemy was delayed by public opposition. Raising awareness about invasive species in Hawaii is the purpose of the Hawaii Invasive Species Council Public Outreach Working Group (POWG). POWG organized statewide biocontrol educational activities. For Big (Hawaii) Island Invasive Species Committee (BIISC) outreach staff, biocontrol issues became particularly important with the strawberry guava proposal. One vocal Big Island activist raised public concern against biocontrol using a variety of tactics (described in Warner and Kinslow, 2011). BIISC outreach strategy focused on responding to issues that resonated with many members of the population. Key issues raised by the public to outreach staff revealed: the lack of agreement that strawberry guava is a problem that needs biocontrol (the tree has food value and natural area impacts are unseen); the public is primarily aware of examples of disastrous introductions and unaware of the extent and successes of biocontrol releases in Hawaii; the fear of rapid evolution of biocontrol agents to new hosts is pervasive; the lack of understanding of insect biology and genetics contributes to fear of rapid evolution; and, the public does not understand the selection process, research and testing protocols, and the regulatory process involved in classical biological control. A long-term education program with basic curricula plus materials on each species released would help agencies build public support for future releases.

Introduction

Biocontrol has a long history in Hawaii, with almost 800 species introduced, 300 established, complete control of approximately 40 insect species and substantial control of approximately 150 insect species, and successful control of approximately 10 weed species (Funasaki et al., 1988; Culliney and Nagamine, 2000; Culliney et al., 2003).

However, many people are familiar only with the famous mistakes (mongoose, cane toad) and not at all familiar with the extent or successes of other biocontrol releases. Biocontrol history in Hawaii commenced under the leadership of King Kalakaua. This last king, revered for his leadership in preserving Hawaiian culture, also passed laws (1890) to prevent immigrant insect pests from entering Hawaii. The first biocontrol release (1890) was the vedalia beetle (Rodolia cardinalis Mulsant), which successfully controlled the cottony cushion scale (Icerya purchasi Maskell). After the reign of Queen Liliuokalani, Albert Koebele was hired as entomologist and biological control expert for the Republic of Hawaii. In the early period, attention was focused on agricultural pests and the general public had little knowledge of biocontrol.

One might characterize the 20th century in "biocontrol eras", beginning with a long period of introductions to address agricultural pests with little review, then an era euphoric about pesticide efficacy,
and next an era impressed with biocontrol. With the greater ecological consciousness of the 1970's and entomological research, awareness of non-target impacts began to increase. However, there was also developing interest in the idea of using natural enemy introductions to slow the spread of weeds in conservation areas. Concurrently, the regulatory review process became increasingly strict, with committees of specialists reviewing proposals, and requirements for NEPA documents.

Still, most biocontrol proposals were not widely noticed by the public until an activist became concerned about proposals to introduce a scale insect to control strawberry guava (Psidium cattleianum Sabine). This vocal Big Island resident activist raised public concern against biocontrol using a variety of tactics. His tactics have been described in Warner and Kinslow (2011) and were familiar to BIISC, as he has opposed numerous other projects to control coqui, mangrove, and invasive species work in general.

**Methods**

Raising awareness about invasive species in Hawaii is the primary purpose of the Hawaii Invasive Species Council Public Outreach Working Group (POWG). Core members of the group include the outreach staff of the invasive species committees (ISC) on each island. In 2009 four focal topics were identified as outreach priorities, one of which was biocontrol. POWG organized several biocontrol educational activities, including a documentary video, a biocontrol communications conference held March 2010, and a general brochure (produced collaboratively with the Hawaii Department of Agriculture) for public and legislator education (distributed at Ag Day at the Capital). Several video segments about biocontrol were shown on Outside Hawaii (an audience of 20,000 every week on TV alone, plus viewers at the website). The video focused on the recovery of the native wiliwili tree after a successful biocontrol effort. There were also some interviews about the impacts of strawberry guava and the need for biocontrol as a separate segment (http://www.oc16.tv/shows/32) A website was posted about strawberry guava biocontrol specifically to assist with the EIS public review process (http://www.hear.org/strawberryguavabiocontrol/).

The biocontrol communications workshop brought agency staff, researchers, land managers and outreach specialists together to talk about challenges and approaches to communicating about biocontrol. Since then, the biocontrol working group was convened for one meeting. The Maui Invasive Species Committee (MISC) worked with their county council to pass a resolution supporting the use of biocontrol. The Big Island County Council, in response to the strawberry guava controversy, passed a resolution against biocontrol. A site visit to a public forest infested by dense strawberry guava convinced the participating council members of the need for biocontrol, but not all council members chose to or were able to attend.

BIISC outreach strategy, particularly with regards to the strawberry guava proposal, focused on responding to biocontrol issues that resonated with many members of the public. The BIISC program participates in an average of one public outreach event per week, often in the form of information booths at varied festivals, plant sales, farmers markets, or spoken presentations to public or school groups. The BIISC outreach specialist presented an oral presentation on the history and successes of biocontrol in Hawaii at the 2009 Hawaii Conservation Conference. Presentations were also developed to educate and intrigue the public on the biology and importance of insects. Better understanding of insects will help the public to assess risk.

**Results**

Key issues raised by members of the public to outreach staff revealed that: the public generally is aware of one or two examples of disastrous failed introductions and is totally unaware of the extent and successes of biocontrol in Hawaii; fear of rapid evolution of the host to new targets is pervasive; a lack of understanding of insect biology and genetics contributes to the fear of rapid evolution; and the public does not understand the quarantine testing, regulatory process and limits on biocontrol releases. Through discussions and exhibits, many individuals expressed relief that biocontrol introductions were not as haphazard and uncontrolled as they had thought them to be. Most significantly, other
biocontrol releases have not been met with much opposition, before, during, or since the strawberry guava biocontrol issue came to a head.

The public’s view of the invasive species considered for biocontrol affects whether or not a project receives support. For example, in the case of the wiliwili tree decimated by an accidentally introduced wasp, people saw the trees die and understood the gall wasp was a problem. Biocontrol of the gall wasp was not opposed. People do not see the watershed, do not see the full extent of the strawberry guava invasion, and therefore, they do not understand the impact (on groundwater, on cultural values, and on native species). Strawberry guava is not a recently introduced species and so has social familiarity and is perceived as a useful tree. Because it has some food value, attempts to control strawberry guava were portrayed as attempts by government to control the food supply, which is linked to fears of genetically modified foods. The relationship of strawberry guava fruit in promoting damaging fruit flies is not well understood by the public.

**Discussion**

Agencies may give undue weight to public opposition to biocontrol projects if that opposition is based on misinformation which can be corrected. Public opinions can change rapidly when a broader context of history, methods, successes, and regulation is described. Biocontrol is an important management tool for the threats facing Hawai‘i. For biocontrol to be successful, agencies must be committed to and have the resources necessary for the research, development and education necessary before a release. This strong agency support and education will help the public in supporting this tool. Limited support runs the risk of achieving neither conservation goals nor reducing public concern with risk.

It is recommended that agencies and resource managers in Hawaii devote significant resources to produce educational materials to publicize biocontrol methodology and successes in Hawaii. Basic curricula should educate and intrigue the public on the biology and importance of insects.

A discussion of genetics and reasons for host specialization is also important. Good guy and bad guy cards, identification cards, and the current fascination with forensic anthropology may be useful lures. Another interesting possibility would be to engage citizen groups in rearing of approved biocontrol agents, as has been done elsewhere in the world. Future biocontrol projects should evaluate public attitudes towards the particular species, and plan outreach accordingly, while building general awareness and support.

Other current limitations for the state are the shortage of adequate quarantine facilities for testing. Public support for biocontrol proposals would help convince policy makers that these facilities should be funded.

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**References**


