

Pilot trials on St. Eustatius to contain the spread of and eradicate the invasive Giant African Land Snail



Summary

In 2013, the invasive Giant African Land Snail, *Achatina fulica* was found in a small part of urban St. Eustatius. In collaboration with local government agencies and Dutch universities we conducted field and laboratory pilot trials of control methods from October 2015 to June 2016. From the initial two gardens in 2013, the species has since been confirmed in 37 gardens encompassing an epicentre of about 100 lots in the Bay Brow area. During the study period, application of eco-friendly iron-phosphate snail bait successfully prevented further spread into adjacent buffer-zone monitoring areas. Iron-phosphate snail bait was effective in greatly reducing snail population density. It was applied once a week at an average density of 0.7 g/m² at garden level, but was concentrated in hotspot snail habitat areas. Nevertheless, hand picking, which is more labour intensive and gives more variable results, also appeared effective in reducing snail density. Finally, beached *Sargassum* seaweed, brought forth as a snail deterrent used on neighbouring islands, did not measurably kill snails above zero control levels, and we conclude that seaweed is unlikely to be effective in snail control.

Introduction

Giant African Land Snails (*Achatina spp.*) are invasive species that are spreading world-wide throughout the tropics and subtropics. They are a major pest to agriculture, a potential threat to native snail species due to food competition, and serve as vector for several diseases known to be dangerous to man. In 2013, *Achatina fulica* was found in a small residential area of St. Eustatius. After discovery it was initially combatted by means of handpicking and mollusc baits but the program was not set through. As of 2015, the species was still in an early phase of the invasion process and control to prevent further spread into conservation areas was still highly opportune. The Dutch Ministry of Economic Affairs provided supplemental funds for planning and field implementation of control and eradication pilot-trials. In collaboration with the St. Eustatius Agriculture and Public Health Departments and the St. Eustatius National Parks Foundation, three interns from Van Hall-Larenstein and HAS Universities of Applied Sciences in the Netherlands, conducted field and laboratory trials from October 2015 to June 2016.

Methods

The current distribution and population structure of the species on St. Eustatius was mapped. Using snail trap counts as an index of population density, a 20 garden-lot experiment was conducted to test the utility of iron-phosphate snail baits to kill snails. Bait was applied once a week at an average density of 0.7 g/m² at garden level, but was concentrated in hotspot snail habitat areas. Laboratory trials were done to test the novel local observation that salty *Sargassum* seaweed bait could also kills snails. The effectiveness of beached *Sargassum* as a molluscicide was compared to that of snail bait using 5 treatment types (including controls) in 4 replicate experiments each involving 20 medium-sized snails. Thanks to a multi-media information campaign the island public participated actively by volunteering information and allowing almost fulltime access to their gardens.

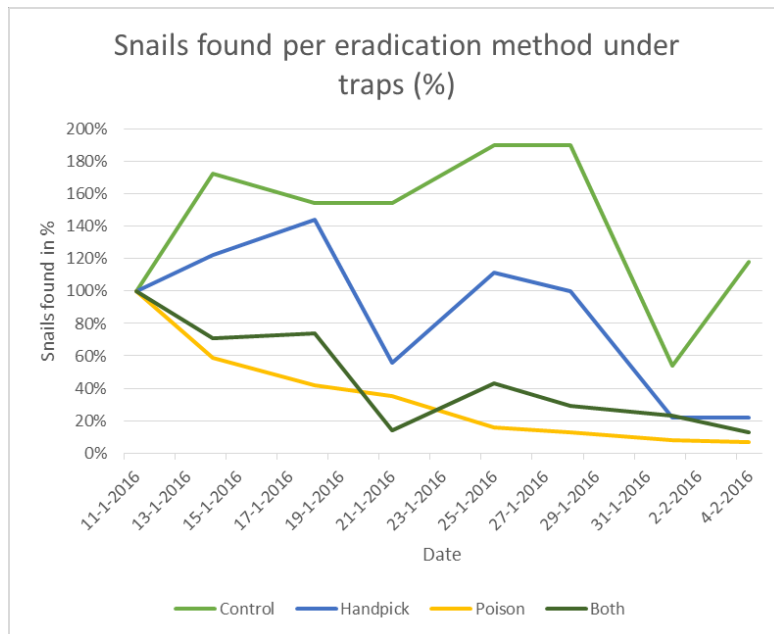


Figure 1. Field snail population density trends (as monitored using snail traps and compared to controls) using either, iron phosphate snail bait, handpicking or both.

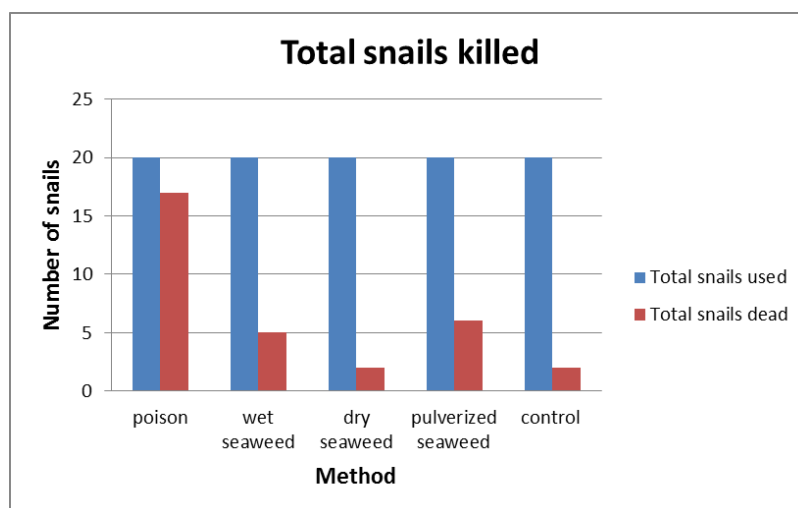


Figure 2. The cumulative snail mortalities for five cage experiments to test the effectiveness of different *Sargassum* seaweed snail baits.

The most salient four findings were as follows:

- From the initial two gardens in 2013, the species has since been confirmed in 37 gardens encompassing an epicentre of about 100 lots in the Bay Brow residential area.
- From October 2015 to June 2016, application of eco-friendly iron-phosphate snail baits successfully prevented further spread into adjacent buffer-zone monitoring areas.
- Iron-phosphate snail bait was found to greatly reduce snail population density. Nevertheless, hand picking, which is more labour-intensive and gives more variable results, was also effective in reducing snail populations.
- *Sargassum* seaweed did not measurably kill snails above control levels, and we conclude that seaweed is unlikely to be effective in snail control.

Based on these encouraging results, control and eventual eradication of *Achatina* from St. Eustatius still seems feasible using a combination of snail baits and handpicking combined with dedicated monitoring. We hope that in the context of the recently drafted Dutch Caribbean joint policy action-plan against invasive species, the St. Eustatius island government and Dutch central government will support continued efforts to contain and eventually wipe out this invasive agricultural pest.

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