

ERADICATION OF THE GIANT AFRICAN SNAIL IN FLORIDA

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Abstract. The giant African snail (*Achatina fulica*), one of the most serious plant pests known, has been eradicated from Florida. This is the first time eradication has ever been achieved anywhere in the world following an established infestation. It was introduced into Florida by a young boy who carried 3 snails in his pocket while on a return flight from Hawaii in June 1966. He released them in his yard with the resulting infestation coming to the attention of the Division of Plant Industry in September 1969, a full 3 years later. Nine major areas (all residential) were found infested in Dade and Broward counties. More than 25,680 cumulative properties were treated, some more than 70 times. A total of 128 tons of arsenate-metaldehyde bait was applied in treatments over a period of 4 1/2 years. Almost one million properties were surveyed in a period of 5 1/2 years. Eradication was achieved with an expenditure of \$700,000 in state and federal funds and with an input of 67,183 manhours of effort.

The giant African snail (*Achatina fulica*) originated in Africa, and is one of the most serious snail plant pests known the world over. The snail derives its name from its large size (up to 7 inches) and has the biotic potential for developing large colonies. From Africa, the snail was carried to Madagascar, India, the Philippines, Formosa, and other Pacific Islands, including Hawaii. It was spread deliberately by snail fanciers, as well as unintentionally by attaching itself to materials and equipment being shipped from infested areas.

It has been intercepted many times at ports of entry, particularly on the West Coast of the United States. It has been found as far north as Kobe, Japan, but has never become established in these areas.

The eggs are pale yellow, elliptical, about 4 to 5 mm in diameter, and are laid in clutches varying in number from 100 to 400 which require about 30 days to hatch. Several clutches may be produced by an individual snail each year. Most of the eggs are laid during wet seasons in organic matter at the base of plants and in depressions

in the soil. The explosive reproductive potential of this snail is enormous.

This snail was found in Florida in September 1969. It was introduced from Hawaii in June 1966, when a youngster brought 3 snails into Florida from Hawaii to show his grandmother.

A combination of factors that prevail in Florida was instrumental in the snail's growth, survival, and rapid dispersal. These include lush tropical foliage, abundance of calcium carbonate, lack of predators, and mild winters.

Many plants, including agricultural crops and ornamentals, are attacked. The severity is dependent on the individual situation, plant species, snail population, and location. Severe damage has been reported on beans, cabbage, carrots, citrus and corn seedlings, cucumbers, hibiscus, melon, papaya, and peanuts. Generally, plants belonging to the Cruciferae, Cucurbitaceae, and Leguminosae are most frequently attacked and suffer the greatest damage. Seedlings of all crops appear to be preferred.

The nuisance factor connected with this pest is not to be underrated. The snail multiplies in almost unbelievable numbers and during the peak of the infestation, it was impossible to walk any distance in an infested area without stepping on a snail. They die in great quantities as a result of the bait treatments, and create rank odors. Their craving for calcium has caused them to attach themselves to concrete block walls of buildings. Although the damage to homes was not extensive, it was most unattractive and added to maintenance cost.

Snails are more likely to be found on cloudy or rainy days, in early morning and late evening when the heat from the sun is not so intense. They are often found in piles of rubbish or litter left accumulated in residential areas. They are usually found around the foundation of houses in shady areas under and behind shrubbery or in flower beds.

During dry weather the snail may aestivate for as long as 9 months. When the humidity is favorable, aestivation is broken and feeding and egg laying resumes.

The Florida infestation generated international publicity. From the beginning of the program, it was realized that if this pest was to be eradicated, an intensive effort using every means available would be required. A four-pronged attack was launched against the pest:

- 1) A pelletized cornmeal bait containing 5% calcium arsenate and 3.25% metaldehyde was applied at the rate of 30 to 40 pounds per acre. Weekly treatments were applied for 6 weeks to all infested and adjacent non-infested properties, or until the snail populations were reduced to low levels. Then the bait was applied biweekly for another 6 weeks or until the snail populations reached undetectable level and, thereafter, once a month for 1 year past the time the last live snail was detected. Although metaldehyde serves the dual purpose of attractant and toxicant, it is not satisfactory when used alone. Though classified as a toxicant, it generally serves to paralyze the snail, making it vulnerable to dehydration. On moist days or in moist situations, dehydration of the snail may not occur to the extent that death will result. The paralyzing effect may wear off and the snail will survive. Calcium arsenate is added to overcome this deficiency and serve as the lethal ingredient in the bait. More than 25,680 cumulative properties were treated, some more than 70 times. A total of 128 tons of the arsenate-metaldehyde bait was applied over the 4 1/2 years of treatment.
- 2) In addition to the bait application, a drench treatment was applied to all infested properties where live snails had been found within the previous 12 months. This treatment consisted of 3 1/2 pounds of 80% wettable Sevin to 200 gallons of water, applied at the rate of 800 to 1,000 gallons per acre. The intervals between applications were the same as the bait treatments. This drench treatment was found to be effective against newly hatched and very young snails.
- 3) As a supplement to the pesticides treatment, a very intensive effort was directed toward hand collecting all snails, both dead and alive. This procedure evolved into what is now called a biometric survey. In this plan, both infested and noninfested properties were selected at random and one-third of the properties were surveyed every 2 weeks. With this system, 100% survey of all properties was obtained every 6

weeks. The survey was continued on all properties within the treatment area for 2 years after the last live snail was detected. Close to one million residential and commercial properties were surveyed over a period of 5 1/2 years.

- 4) All infested properties were cleaned up since sanitation discouraged snail build-up. This consisted of removal of all trash, debris, weeds, and other items which provide shelter and concealment for snails. This proved to be a tremendous task of time and effort.

Although significant progress was being made toward eradicating the snail from known-infested areas, additional effort was conducted in the summer of 1972, in an attempt to be apprised of any heretofore undetected infestations. As many as 326,750 attractive brochures were prepared and mailed to every postal patron in an area of approximately 5-mile radius surrounding the known-infested area. After the mailing was completed, the University of Miami was contracted to evaluate the effectiveness of the brochure campaign. The results of this evaluation indicated that about 50% of the patrons receiving the brochure read it and made a decision as to whether or not snails were present on their properties. Statistically, this effort appeared most successful.

The last snail infestation was found on Medina Street in Opa Locka on July 14, 1972. This infestation was discovered as a result of a reply from a homeowner responding to a brochure that was received, attesting to the added value of the mail-out brochure. A maximum effort was made during all phases of the program to keep the public informed.

The giant African snail was officially declared eradicated from Dade and Broward counties on April 13, 1975. Florida has been declared the first place in history that had successfully eradicated the giant African snail from an area where it had become thoroughly established.

The total cost of the eradication program for this serious snail was \$700,000 in state and federal funds and the input of 67,183 manhours of effort. Eradication was made possible with the excellent cooperation of residents in the infested counties and the dedication of state and federal field personnel.