

Air Potato in Florida

William A. Overholt¹, Kenneth Langeland², Eric C. Morgan¹, Jim Moll³ and Ken Gioeli⁴

¹Indian River Research and Education Center, University of Florida, Fort Pierce 34945; ²Center for Aquatic and Invasive Plants, University of Florida, Gainesville 32611, ³Hernando County Cooperative Extension Service, Brooksville 34601, ⁴St. Lucie Co. Cooperative Extension Service, Fort Pierce 34945

Introduction

Air potato, *Dioscorea bulbifera*, is a member of the yam family, and native to Asia and sub-Saharan Africa. The background of the introduction of this plant into Florida is uncertain. Coursey (1967) speculated that air potato was brought into the Americas with slave ships from Africa. Recent research provides evidence of an African origin (Overholt et al. 2003). Air potato was introduced into Florida in 1905 (Hammer, 1998), and can now be found throughout the state, and also in Mississippi, Louisiana, Texas, Hawaii and Puerto Rico. Air potato is on the Florida Exotic Plant Pest Council's Category I list, which includes the most serious exotic plant invaders in the state. It is also listed as a Florida Noxious Weed by the Florida Department of Agriculture and Consumer Services, and is therefore illegal to propagate, transport, or possess.

The Problem

Air potato invades a variety of natural areas in Florida including pinelands and hammocks. It rapidly grows to the tops of tree canopies and forms a vine mat which weighs down and shades out native vegetation (Figure 1). Once air potato invades an area, it is difficult to eliminate due to the prolific production of aerial tubers.



Figure 2. Air potato vine mat covering cabbage palm in Glades Co., Florida

How air potato spreads

Air potato rarely flowers in Florida, and is not known to reproduce sexually. All, or nearly all reproduction is asexual. The plant reproduces using aerial tubers (also called bulbils) (Figure 3). These aerial tubers grow along the vines and can be found on plants in the fall and winter. The size of the aerial tubers ranges from that of a small marble to as large as a softball. The aerial tubers eventually drop from the vines and sprout in the spring. The tubers can be carried long distances in flowing water.



Figure 3. Aerial tubers (bulbils)



Figure 4. Air potato vine

How to recognize Air Potato

Air potato is a twining (to the left as it goes up) herbaceous vine (Figure 4), which arises from an underground tuber (Figure 5). Stems can grow as long as 60 feet in length. The vines are round or slightly angled in cross section. Aerial tubers form in leaf axils (Figure 6). There appear to be two types of air potato bulbils in Florida; most are dark coffee colored and warty, but some plants produce light tan bulbils with smoother skin (Figure 7). The leaves are attached to the stem with long leaf stalks and are alternately arranged along the stem. The leaves can be 8 inches or more long, and are nearly as wide. The leaves are heart shaped, basally lobed and quickly taper to a point at the leaf tip. All leaf veins arise from the point at which the leaf meets the petiole (Figure 8). Flowers (rare in Florida) are small, fragrant and arise from leaf axils and loose clusters up to 4 inches long. Male and female flowers are found on separate air potato plants.

The presence of aerial tubers separates alien air potato and white yam from the two native yams (*D. floridana* and *D. villosa*). The size of the vine can also be used to identify the natives from the invasives. The native species are smaller plants with vines only about 10 feet long. Alien air potato can reach six times that. In addition to air potato, there are also two other exotic yams in Florida's natural areas; *D. alata* (white yam) and *D. sansibarensis* (Zanzibar yam). The stem of white yam is winged or angled, and thus can be easily separated from air potato which has a more rounded stem. Its vines also twine in to the right, unlike air potato which twines to the left. The other two native yams can be separated from each other by the shape of the leaves, and the structures of their flowers.

Control

The herbicides Garlon 3A diluted with water to 1.25%-2.0% (1.6-2.6 ounces per gallon of spray) or Garlon 4 diluted with water to 0.5%-2.0% (0.6-2.6 ounces per gallon of spray) are effective for controlling air potato when sprayed on the foliage. Garlon 3A and 4 can be purchased from agricultural supply stores. When the vines are growing in trees and mixed with desirable plants, the air potato vines should be cut and destroyed, and the remaining plants sprayed with the herbicide solution. As many bulbils as possible must be collected and removed from the site since those that remain will sprout and produce new plants. Plant material must be disposed of in such a way that it does not spread the plant to new areas. A proper disposal method would include incineration of the disposed material. Several follow up herbicide treatments will be required through the growing season and perhaps in successive years. Plants become dormant in the winter. Locating and removing bulbils is easier during the winter when air potato and other vegetation is not as dense as during the summer. Herbicides should be applied when the plants are actively growing in spring and early to mid-summer.

Herbicides must be applied according the instructions on the label. It is highly recommended that those who have not had previous training in the application of pesticides contact the Cooperative Extension Service in their county for information and training opportunities. Professional landscape maintenance personnel must comply with pesticide licensing and certification requirements under F.S. 482.



Figure 5. Underground tuber



Figure 6. Young bulbil growing in leaf axil



Figure 7. Types of bulbils found in Florida



Figure 8. Heart shaped leaf

Additional information

Center for Aquatic and Invasive Plants: <http://aquat1.ifas.ufl.edu/dicbul.html>
The Nature Conservancy: <http://inweeds.ucdavis.edu/moredocs/diospp01.pdf>

Literature cited

Coursey, D. G. 1967. Yams: an account of the native, origins, cultivation and utilization of the useful members of the Dioscoreaceae. Longmans, London.
Hammer, R. L. 1998. Diagnosis Dioscorea. Wildlands Weeds 1: 8-10.
Overholt, W. A., C. Hughes, C. Wallace and E. C. Morgan. Origin of air potato identified. Wildlands Weeds 7: 9.