

Natural Area Weeds: Air Potato (*Dioscorea bulbifera*)¹

K.A. Langeland and M.J. Meisenburg²

Introduction

Plants provide us with food and fiber, decorate our yards and gardens, and provide habitat for wildlife. However, when plants grow where they are not wanted, we call them weeds. To home owners, weeds may be unwanted plants in lawns or gardens. To farmers, weeds are plants that interfere with raising crops or livestock. To biologists who manage natural areas, weeds are plants that interfere with the functions of natural communities.

Natural area weeds are often exotic plant species (plants whose natural range does not include Florida and were brought here after European contact, about 1500 AD) that have become naturalized (capable of reproducing outside of cultivation). Invasive exotic plants are weeds that alter the functions and value of natural areas by displacing native species (plants whose natural range included Florida at the time of European contact) and disrupting natural processes such as fire and water flow. Natural area managers must remove invasive exotic plant species to maintain the integrity of natural areas.

Air potato is an invasive plant species in Florida that should be removed from public and private properties to help protect the state's natural areas. It has been listed by the Florida Exotic Pest Plant Council as one of Florida's most invasive plant species since 1993 and was added to the Florida Noxious Weed List by the Florida Department of Agriculture and Consumer Services in 1999 (5b-57.007 FAC). Plants on the Florida Noxious Weed List may not be introduced, possessed, moved, or released without a permit.

Impacts

Air potato can quickly engulf native vegetation in natural areas, climbing high into mature tree canopies (Figure 1). It produces large numbers of bulbils (aerial tubers), which facilitate its spread and make it extremely difficult to eliminate because new plants sprout from even very small bulbils. It invades a variety of habitats including pinelands and hammocks of natural areas (Langeland et. al. 2008).

1. This document is SS AGR 164, one of a series of the Agronomy Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date May, 2001. Reviewed: November 2003. Revised March 2008. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

2. K.A. Langeland, professor, Agronomy Department, Center for Aquatic and Invasive Plants; M. J. Meisenburg, biologist, Agronomy Department; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication does not signify our approval to the exclusion of other products of suitable composition. All chemicals should be used in accordance with directions on the manufacturer's label.



Figure 1. Air potato vine engulfing native cabbage palm.
Credits: Ken Langeland, UF/IFAS

Distribution

Native to tropical Asia and sub-Saharan Africa, air potato was introduced by ancient Polynesians throughout much of the South Pacific where it is now considered invasive. It was brought to the Americas from Africa during the slave trade (Coursey 1967), and introduced to Florida in 1905 (Morton 1976). It is found throughout the state from Escambia County, in the Panhandle, to the Florida Keys (<http://www.plantatlas.usf.edu/maps.asp?plantID=1726>).

Air potato is a member of the yam family (*Dioscoreaceae*). Yams are cultivated for their edible underground tubers in western Africa, where they are important commodities. However, uncultivated species—such as air potato—are generally bitter and even poisonous.

How to Recognize Air Potato

Air potato is a vigorously twining herbaceous vine, often arising from an underground tuber. Freely branching stems grow to 60 ft. in length. Stems are round or slightly angled in cross section and twine to the left (counter-clockwise). Aerial tubers (bulbils) freely form in leaf axils (Figure 2). Bulbils are usually roundish with mostly smooth surfaces, and grow up to 5 in x 4 in. (Figure 2). Leaves are long

petioled (stalked), alternate; blades to 8 in. or more long, broadly heart shaped, with basal lobes usually rounded and with arching veins all originating from one point (Figure 3, Figure 4). Flowers are rare (in Florida), small and fragrant, with male and female arising from leaf axils on separate plants (i.e., a dioecious species) in panicles or spikes to 4 in. long (Figure 4). Fruit is a capsule; seeds partially winged.

Winged yam (*Dioscorea alata*), often mistaken for air potato, is similar in appearance and is also a non-native invasive species. Climbing up to 80 ft. in length, stems are square in cross section with "winged" corners that are often red-purple tinged, and twine to the right (clockwise). Winged yam has opposite leaves that are more triangular and larger than those of air potato. Figure 5 shows air potato and winged yam growing alongside each other. Though not as widespread as air potato, winged yam nonetheless ranges from Escambia to Miami-Dade counties (<http://www.plantatlas.usf.edu/maps.asp?plantID=1750>), and is probably more widespread than has previously been recognized. Winged yam can produce massive edible tubers (Figure 6), some of which have been recorded to weigh over 100 pounds.

Three other introduced species of *Dioscorea* may be encountered in Florida: Chinese yam (*D. polystachya*), Zanzibar yam (*D. sansibarensis*), and wild yam (*D. villosa*). None of these are considered to be invasive. Our native wild yam (*D. floridana*) is infrequent in hammocks and floodplains of northern and western Florida, never forms aerial tubers, and has leaf blades that rarely reach 6 in. long.

Remove Air Potato From Your Property to Protect Florida's Natural Areas

Herbicides containing the active ingredient glyphosate (such as Round up ®) are effective for controlling air potato when sprayed onto the foliage. Glyphosate-containing herbicides can be purchased anywhere herbicides are sold. Air potato is relatively susceptible to glyphosate, and light application rates



Figure 2. Air potato bulbils form in leaf axils. Credits: Ken Langeland, UF/IFAS

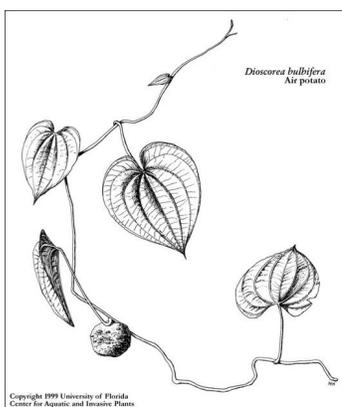


Figure 3. Air potato (*Dioscorea bulbifera*).



Figure 4. Air potato flowers. Credits: Ken Langeland, UF/IFAS

give good results with some selectivity to avoid damaging desirable plants. It is important to cover the foliage as thoroughly with herbicide as possible. Spray the leaves just to the point of run-off because spraying more wastes herbicide on the ground. Spray as many leaves as possible, and as high as the sprayer can reach. However, be careful not to overshoot the target and splatter herbicide on surrounding



Figure 5. Side-by-side comparison of winged yam (left) and air potato (right). Credits: Michael Meisenburg, UF/IFAS



Figure 6. Underground tuber of winged yam. Credits: Wendy Wilbur, UF/IFAS

vegetation, or the applicator. Try to spray at a time when there is no wind, such as early morning. If there is a slight breeze, applicators should position themselves upwind of the air potato to avoid herbicide drift back. If the sprayer has an adjustable tip, a larger droplet size and a straight stream may help to minimize drift and overspray. When mixed with desirable plants, the air potato vines may be pulled onto the ground and sprayed.

Herbicide should be applied late in the growing season for the best results. Plants allocate carbohydrates to their roots during this period, and foliar-applied herbicides can likewise be transported to the roots. For air potato, this period is typically August through October (spray as late as possible,

but before leaves begin turning yellow). Several follow-up applications of herbicide will be necessary in successive years.

As many bulbils as possible must be removed from the site (Figure 7). Those which remain will produce new vines. All plant material including bulbils must be disposed of in such a way that they do not spread the vines to new areas; for example, in a landfill where they will be incinerated. Plants become dormant in winter (during short day-length). Locating and removing bulbils is easier during winter months when air potato and other vegetation are not as dense as during summer. Air potato bulbils cannot tolerate freezing, and overnight in a freezer is the best way to prevent them from starting new infestations.



Figure 7. Remove air potato bulbils and other plant material from site and dispose of in such a way that they do not spread the vines to new areas. Credits: Ken Langeland, UF/IFAS

Herbicides must be applied according to instructions on the label. Individuals who have not had previous training in application of pesticides should contact the Cooperative Extension Service office in their county for information on training opportunities. Property owners may wish to hire a vegetation management contractor to remove air potato for them.

Additional Information About Invasive Plant Species

Center for Aquatic and Invasive Plants Web site
<http://plants.ifas.ufl.edu>.

Florida Exotic Pest Plant Council Web site
<http://fleppc.org>

Identification and Biology of Non-Native Plants in Florida's Natural Areas. Langeland, K. L., H. M. Cherry, C. M. McCormick, and K. A. Craddock Burks. 210 pp. 1998. IFAS Publication SP 257.

Control of Non-Native Plants in Natural Areas of Florida. K.A. Langeland and R.K. Stocker. 34 pp. 2001. IFAS Publication SP 242.

Help Protect Florida's Natural Areas from Non-Native Invasive Plants. K.A. Langeland. 1999. IFAS Circular 1204.

Literature Cited

Coursey, D.G. 1967. Yams: an account of the nature, origins, cultivation, and utilization of the useful members of *Dioscoreaceae*. London: Longmans, Green and Co. Ltd. 230 pp.

Langeland, K. L., H. M. Cherry, C. M. McCormick, and K. A. Craddock Burks. 2008. Identification and Biology of Non-Native Plants in Florida's Natural Areas, 2nd edition IFAS Publication SP 257. University of Florida, Gainesville. 210 pp. In press. First edition available online (<http://plants.ifas.ufl.edu/identif.html>).

Morton, J.F. 1976. Pestiferous Spread of Many Ornamental and Fruit Species in South Florida. Proc. Fla. State Hort. Soc. 89:348-353.