Water Hyacinth (*Eichhornia crassipes*)

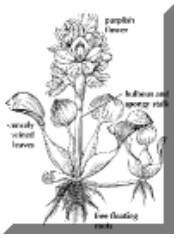
(Photo credit: University of Florida, IFAS, Center for Aquatic Plants, http://aquat1.ifas.ufl.edu/hyacin2.html)

Introduction

DESCRIPTION

Water hyacinth (*Eichhornia crassipes*) has been called the world's worst aquatic weed. It is a free floating water plant that is native to South America. It can vary in size from a few inches tall to over three feet. This plant has blue-green leaves, thick stalks and a showy purple or lavender flower. It thrives in tropical regions and in waters that are high in nutrients. Its beautiful, large purple and violet flowers have made it a popular ornamental, and the plant is now naturalized in most of the southern United States. It reproduces mostly by clonal propagation, but seeds also play a role in its survival and colonization. Massive weed colonies can grow when introduced into areas that are conducive for their proliferation. In addition, infestation can occur given a disruption in the natural ecological balance by human activities such as impounding of flowing waters by dams, channeling and allowing the buildup of eutrophication.

Identification



- free-floating, robust plant grows up to three feet off the water's surface
- shiny green leaves are round to oval, four to eight inches in diameter, with gently incurved sides
- leaf veins are dense and numerous so leaves stand erect
- stalks are bulbous and spongy, and help keep the plant buoyant
- flowers have six petals, purplish blue or lavender with yellow
- several flowers grow at the top of a single stalk
- a mass of fine purplish black and feathery roots hangs in the water underneath the plant

(Source: 1. King County, WA Noxious Weed Control Program, http://splash.metrokc.gov/wlr/waterres/smlakes/hyacinth.htm; 2. Integrated Pest Management Florida, http://www.ifas.ufl.edu/~FAIRSWEB/IPM/ipmfl/v2n4/hyacinth.htm).

IMPACTS

The primary attribute of water hyacinth is its ability to grow under a wide range of nutrient and environmental conditions. The plant is able to develop at an astounding rate, effectively out-competing other native aquatics. Its growth rate is among the highest of any plant known: hyacinth populations can double in as little as 12 days. This rapid growth can cause an imposing amount of biomass. The level of biomass accumulation will determine its nuisance value and the impact on water quality. Excessive infestation by this weed can severely constrain human activities, affecting accesses to water, navigation, irrigation and fisheries. In other words, Incredibly dense mats of free-floating vegetation block boat traffic and prevent swimming and fishing, and keep sunlight from reaching the water column and submerged plants.

(Source: 1. King County, WA Noxious Weed Control Program, http://splash.metrokc.gov/wlr/waterres/smlakes/hyacinth.htm; 2. Integrated Pest Management Florida, http://www.ifas.ufl.edu/~FAIRSWEB/IPM/ipmfl/v2n4/hyacinth.htm).

Top

Geographic Information

ORIGIN

Water hyacinth is native to South America, and was introduced to the United States in the 1880s. It probably originated in the swamps associated with the great river systems of northern and central South America. Water hyacinth has not yet (1998) been found in the wild in Washington State, but has been sold as an ornamental in plant nurseries. Its use as an ornamental means that it could be introduced to our lakes and rivers, and this is expected to be its primary method of spread.

(Source: 1. King County, WA Noxious Weed Control Program, http://splash.metrokc.gov/wlr/waterres/smlakes/hyacinth.htm; 2. Integrated Pest Management Florida, http://www.ifas.ufl.edu/~FAIRSWEB/IPM/ipmfl/v2n4/hyacinth.htm).

DISTRIBUTION

Link to USGS International Program at the EROS Data Center Link

http://edcsnw3.cr.usgs.gov/ip/hyacinth/winam2.html

 **Kisumu Bay, December, 1997**	 **Kisumu Bay, February 2000**	According to the website of USGS International Program, the photographs at left were taken from nearly the same point on the south shore of Kisumu bay. The December 1997 photo shows an enormous mat of nearly pure water hyacinth. By February 2000 hippograss had become established in the area formerly dominated by water hyacinth.

Top

Control Methods

Control *Water hyacinth*

Water hyacinth can be controlled by harvesting, aquatic herbicides, and biological control agents. Locally, the best way to manage water hyacinth is to prevent it from becoming established. Plants purchased at local nurseries should be disposed of away from waterbodies.

Mechanical Control: Swamp Devil & Harvester

The Swamp Devil is a heavy duty aquatic vegetation cutter that features tow blades at the front which measure 2.4 meters across. It had a 234 horsepower engine and can easily shred trees up to 15 cm in diameter. It will be collecting and removing a portion of the chopped debris.

The harvester has the ability to carry four tons of vegetation on board in a single load. Depending on the weight and volume of the vegetation and the distance to the shore, the harvester can potentially remove 16 to 32 loads of chopped hyacinths in eight hours.

Water Hyacinth Uses:

As Fodder for Pigs

Boiled water hyacinth is used in Southeast Asia as a feed for pigs. The plants are chopped and sometimes mixed with other vegetable wastes, such as banana stems, and boiled slowly for a few hours until the ingredients turn into a paste, to which oil cake, rice bran and sometimes maize and salt are added. The cooked mixture is good for only three days, after which it turns sour. A common formula is 40 kg of water hyacinth, 15 kg of rice bran, 2.5 kg of fish meal and 5 kg of coconut meal.

Products from Water Hyacinth - Ryan Foundation Link

Products from Water Hyacin: Hyacinth Crafts Link





(Source: 1. Integrated Pest Management Florida, http://www.ifas.ufl.edu/~FAIRSWEB/IPM/ipmfl/v2n4/hyacinth.htm; 2. Water Hyacinth Information Page: *http://homepage.westmont.edu/u/outside/phil.soderman/www/); 3.* Aquatic Plant Harvesting. Lake Victoria, Kenya**,** *http://www.water-hyacinth.com/)*

Top

Flower spike/photo BMR

Useful Picture Collections

	Credit: photo JMR Org: Wildland Invasive Species Program (Lake was covered with hyacinth)		Credit: photo BMR Org: Wildland Invasive Species Program (Flower spike)
	Credit & Org: University of Florida, IFAS, Center for Aquatic Plants (Lake was covered with hyacinth)		Credit: Ann Murray Org: University of Florida, IFAS, Center for Aquatic Plants (Drawing of **water hyacinth**)
	Credit: Kerry Dressier Org: Integrated Pest Management (IPM) (Water hycinth in bloom)		Credit: Dr. Adrian E. Williams Org: University of Waterloo (Canada) and FIRRI (Uganda) Collaborative Project. (Water hycinth in bloom)
	Credit& Org: VAUGHAN CHOPPER PUMP (Water hycinth)		Credit& Org: VAUGHAN CHOPPER PUMP (Water hycinth)
	Credit& Org: VAUGHAN CHOPPER PUMP (Water hycinth)		Credit& Org: VAUGHAN CHOPPER PUMP (Water hycinth)
  	Credit& Org: Aquatic Plant Harvesting. Lake Victoria, Kenya (Huge mats of water hycinth have paralyzed the area, at times preventing even large boats from leaving the harbor in the Port of Kisumu)		

Top

Related Sites

Invasive Nonindigenous Plants in Florida: University of Florida, IFAS, Center for Aquatic Plants
http://aquat1.ifas.ufl.edu/hyacin2.html
This website provides information about brief history, identification, control methods, and downloadable information sheet.

Water Hyacinth Information Page: Phil Soderman, Sterling Nursery, Carpinteria, California

http://homepage.westmont.edu/u/outside/phil.soderman/www/
This site shows a collection of Water Hyacinth information including Water Hyacinth Information; Constructed Wetlands Information; San Pasqual Aquatic Treatment Facility; Water Hyacinth uses; Water Hyacinth COMPOST References, and so on.

Aquatic Plant Harvesting, Lake Victoria, Kenya
http://www.water-hyacinth.com/
This site introduces special equipment to chop water hyacinth. In addition, the site includes information about challenges, solution, hyacinth uses and so on.

Water Hyacinth: University of Waterloo (Canada) and FIRRI (Uganda) Collaborative Project
http://freespace.virgin.net/ae.williams/Work.htm
This sites introduces general information related to water hyacinth and project information conducted by Dr. Adrian E. Williams.

Remote Monitoring of The Water Hyacinth Infestation of Winam Gulf, Kenya: USGS International Program
http://edcsnw3.cr.usgs.gov/ip/hyacinth/winam1.html
This website introduces severe water hyacinth infestations on Winam Gulf, in the Kenyan portion of Lake Victoria during the late 1990s and early 2000. This site shows a series of Radarsat images and other real data related to water hyacinth.

Weeds on the web: Wildland Invasive Species Program
http://tncweeds.ucdavis.edu/esadocs/eichcras.html
This website includes links to all our resources specific to individual invasive species, and provides useful information and pictures related wild land invasive species including water hyacinth.

King County Water & Land Resources Division, Lake Stewardship Program
http://splash.metrokc.gov/wlr/waterres/smlakes/hyacinth.htm
This site includes several good descriptions including history, method of spread, methods of control, and identification.

Top

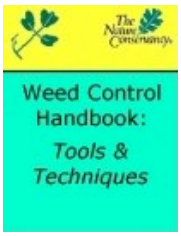
Educational Resources

More information about water hyacinth, as contained in the Langeland/Burks book, Identification & Biology of Non-Native Plants in Florida's Natural Areas (*Free*): University of Florida.
To download PDF file *http://aquat1.ifas.ufl.edu/hyacin2.html*

Weed Control Methods Handbook: Tools and Techniques for Use in Natural Areas
Link *http://www.dnr.state.wi.us/org/land/er/invasive/info/loose2.htm*
Online brochure provides very detailed general and regional information, current extent, and control methods.

Weed Control Methods Handbook: Tools and Techniques for Use in Natural Areas by Mandy Tu, Callie Hurd, & John M. Randall. (*Free*): Updated version from April 4, 2001). Link *http://tncweeds.ucdavis.edu/handbook.html*

This online handbook provides very detailed information about herbicides and control techniques.



Introductory Material

Table of Contents, 2 pages. (Word, Acrobat)

Introduction, 3 pages. (Word, Acrobat)

Chapters

Chapter 1 - Manual and Mechanical Techniques, 7 pages. (Word, Acrobat)

Chapter 2 - Grazing, 6 pages. (Word, Acrobat)

Chapter 3 - Prescribed Fire, 10 pages. (Word, Acrobat)

Chapter 4 - Biocontrol, 24 pages. (Word, Acrobat)

Chapter 5 - Guidelines for Herbicide Use, 18 pages. (Word, Acrobat)

Chapter 6 - Herbicide Properties, 13 pages. (Word, Acrobat)

Chapter 7 - The Herbicides

Herbicide Table, 4 pages. (Excel, Acrobat)

A: 2,4-D, 11 pages. (Word, Acrobat)

B: Clopyralid, 6 pages. (Word, Acrobat)

C: Fluazifop-p-butyl, 6 pages. (Word, Acrobat)

D: Fosamine Ammonium, 6 pages. (Word, Acrobat)

E: Glyphosate, 10 pages. (Word, Acrobat)

F: Hexazinone, 11 pages. (Word, Acrobat)

G: Imazapic, 8 pages. (Word, Acrobat)

H: Imazapyr, 7 pages. (Word, Acrobat)

I: Picloram, 10 pages. (Word, Acrobat)

J: Sethoxydim, 6 pages. (Word, Acrobat)

K: Triclopyr, 8 pages. (Word, Acrobat)

Appendices

Appendix 1 - PVC applicator, 2 pages. (Word, Acrobat)

Appendix 2 - Spot-burning, 4 pages. (Word, Acrobat)

Appendix 3 - How to read a pesticide label, 4 pages. (Word, Acrobat)

Appendix 4 - How pesticides are regulated in the U.S., 2 pages. (Word, Acrobat)

Appendix 5 - List of Personal Contacts, 1 page. (Word, Acrobat)

Appendix 6 - List of state regulatory agencies, 6 pages. (Word, Acrobat)

⌗ Water Hyacinth: Illegal Aquatic Plants of South Carolina (*Free*, PDF file): South Carolina Dept. of Natural Resources, Aquatic Nuisance Species Program

✘ Link *http://water3.dnr.state.sc.us/dnr/water/envaff/aquatic/img/hyacinth.pdf*

⌗ Help Prevent the Spread of Aquatic Plants and Animals (IL-IN-SG-98-1, *Free*): Illinois-Indiana Sea Grant

✘ Link *http://www.iiseagrant.org/publication/br.htm*

Fact sheet describes how exotic aquatic species are spread by boaters. Provides easy steps boaters can take to prevent spread of exotics when transporting watercraft. 4p.

References

✘ Top ✘ Back to Aquatic Exotic Animals & Plants

Home

PROJECT QUESTIONS: fortner.2@osu.edu , TECHNICAL QUESTIONS: lee.1503@osu.edu