Waterhyacinth

[*Eichhornia crassipes* (Mart.) Solms]

Aquatic

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Fig. 1. Waterhyacinth forms dense mats that disrupt water flow and impede navigation. Photo by Wlifredo Robles.

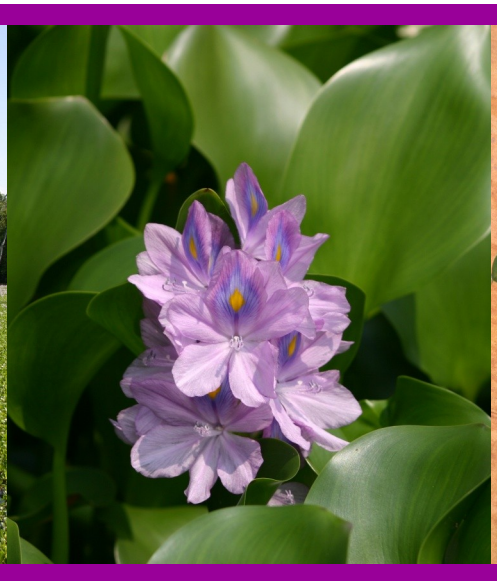

Fig. 2. Waterhyacinth's inflorescence is showy, which explains its importation as an ornamental plant. Photo by Wilfredo Robles.

Fig. 3. Early growth stage waterhyacinth rosette conneted by a stolon to a daughter plant. Photo by John D. Madsen.

Introduction

Problems caused

Waterhyacinth is a perennial free-floating aquatic weed introduced into United States in 1884 from South America as an ornamental in water gardens. Waterhyacinth floats on the water and reproduces mainly by vegetative growth (e. g., stolons), although seed production does occur. By vegetative growth, waterhyacinth can double its biomass within a month at optimum temperatures. The combination of floating mats and rapid growth of waterhyacinth can clog waterways, reduce water flow, impede boat traffic, interfere with hydroelectric power generation, and outcompete native plant communities. It is considered the "world's worst aquatic weed".

Regulations

Waterhyacinth is not a federally-listed noxious weed. Waterhyacinth is listed as a class C noxious weed in Alabama, and recognized as an invasive species in numerous other states.

Description

Vegetative growth

Waterhyacinth is a rosette-forming plant connected by stolons. At early stages of colonization, rosettes are small and grow sparse; once peak density is reached, rosettes will increase in size. Petioles are spongy and inflated in the middle. Leaf blades are 1.5" to 4.5" wide, ovate to circular in shape. Healthy leaves of waterhyacinth are dark green in color. Petioles are shorter and grow horizontally to the water surface at early stages of colonization. However, as plant mature, petioles are longer and grow perpendicularly to the water surface.

Flowering/fruiting

Inflorescence is a contracted panicle growing from the center of the rosette and is composed of up to eight purplish flowers containing ovoid seeds. Seeds may remain dormant in the sediment up to 7 years.

Dispersal mechanisms

Waterhyacinth is predominantly spread by floating rosettes that break away from the growing mat. In addition, stem-bases may grow new leaves after frost damage or herbicide treatments. While seedlings are not a common source of new plants, reinfestation from seed is possible.

Spread by

Boat traffic, wind current, wave action, and water flow are some factors that easily move waterhyacinth in a connected water body. Unconnected water bodies can be easily colonized by waterhyacinth by means of boat movement, flooding, and human transport. In addition, waterhyacinth is still highly prized as an ornamental plant, and is widely used for this purpose.

Habitat

Waterhyacinth is mainly a tropical and sub-tropical plant growing in freshwater such as rivers, lakes, ponds and ditches. Waterhyacinth does not grow at latitudes higher than 40 °N and 45°S. Waterhyacinth does not tolerate long exposure to temperatures lower than 0°C. Short-term exposure to temperatures at or below freezing can be tolerated. Waterhyacinth does not tolerate high salinity. However, eutrophic water bodies containing high levels of nitrogen, phosphorous, potassium and polluted water with heavy metals such as cooper and lead is not harmful to waterhyacinth growth. Waterhyacinth can root in the mud and remain unaffected by drought for a short time of period.

Distribution

US

Waterhyacinth was introduced into the US in 1884 through an exhibit in Louisiana. Since its introduction, waterhyacinth has been spread in AL, AR, AZ, CA, CO, FL, GA, HA, IL, KS, KY, MS, MD, MO, NC, NY, OK, OR, PR, SC, TN, TX, VA, and WA.

MidSouth

It is widespread in LA, MS, AL and found in AR and TN.

Control Methods

Biological

Several insects have been released to control waterhyacinth in the United States, including *Neochetina eichhorniae* and *N. bruchi*. While these insects have reduced the growth of waterhyacinth, they typically do not alleviate the nuisance problem.

Chemical

The systemic herbicides 2,4-D, triclopyr, glyphosate, and imazapyr provide excellent control. Diquat is an excellent contact herbicide, but regrowth typically occurs. A commonly-used tank mixture is 2,4-D and diquat, which will control other nuisance aquatic plants with waterhyacinth. Most large-scale management programs use 2,4-D due to its low cost. Use only herbicides labeled for aquatic use, apply to the foliage, and include a nonionic surfactant with all herbicides.

Table 1. Suggested chemical control methods for waterhyacinth.

Chemical	Trade Name ®	Formulation	Application Rate (gallon acre^{-1})	Surfactant
2,4-D	DMA 4 IVM	Liquid	0.5 - 1	0.25-0.5% v/v non-ionic surfactant
	HardBall	Emulsifiable	0.25-0.5	0.25-0.5% v/v non-ionic surfactant
Diquat	Reward	Liquid	1	1% v/v nonionic surfactant
Glyphosate	Rodeo AquaPro	Liquid	1	1% v/v nonionic surfactant
Imazapyr	Habitat	Liquid	0.25	0.25% v/v nonionic surfactant
Triclopyr	Renovate 3	Liquid	0.5—2.0	0.25-0.5% v/v non-ionic surfactant

Mechanical

Harvesting, raking, and other mechanical methods have been used for control of nuisance problems, but they typically cannot keep up with the rate of growth. Hand removal will work for individual rosettes. Mechanical chopping has been used, but this typically leaves a large amount of biomass and some regrowth will occur from damaged stembases.

Physical

Summer drawdown has been successful in controlling waterhyacinth.

References

Aquatic Ecosystem Restoration Foundation (AERF) 2005. Best Management Practices Handbook for Aquatic Plant Management in Support of Fish and Wildlife Habitat. Aquatic Ecosystem Restoration Foundation, Flint, MI. http://www.aquatics.org/aquatic_bmp.pdf.

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