# Water hyacinth (*Eichhornia crassipes* (Mart.) Solms)

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Problems: Forms dense mats of floating vegetation (Figure 1) that inhibit growth of native plant species and reduce the water quality of habitat utilized by aquatic fauna. Mats can also inhibit recreational uses of waterbodies, commercial navigation, hydro power generation, clog irrigation pumps, and worsen flood events. Water hyacinth is often called "the world's worst aquatic weed" due to its presence on every continent (except Antarctica) and its rapid growth rate.

Regulations: None in MS.

Description: Water hyacinth a free-floating, perennial plant that is often confused with the native American frogbit. The primary characteristic used to distinguish hyacinth from frogbit is the presence of a 'bulbous' structure at the base of the hyacinth leaves. Hyacinth can grow to approximately a meter in height (referred to as 'bull hyacinth' at this stage) and produces large, showy, purple flowers throughout the growing season (Figure 1).

Dispersal: A popular water-gardening plant, water hyacinth is native to South America but has been found throughout many states in the U.S. and is very common in MS (Figure 2; Turnage and Shoemaker 2018; Turnage et al. 2019). Water hyacinth primarily spreads through daughter plants and seeds (Figure 2). Each rosette is capable of producing multiple daughter plants per growing season. In optimal growing conditions, water hyacinth can double in biomass in 5-6 days.

Control Strategies: Physical-summer drawdown may control water hyacinth but will likely cause negative impacts to fish populations. Mechanical-hand removal of small patches and individual rosettes may be effective; mechanical mowers can provide short term relief but usually cause further spread through plant fragmentation. Biological-there are some insects that can cause reduction of nuisance growth, but no known bio-control agents that provide long-term control. Chemical-the herbicides 2,4-D, diquat, glyphosate, imazapyr, and triclopyr have all been shown to be effective against water hyacinth as foliar applications (Table 1); 2,4-D and diquat are commonly tank mixed for water hyacinth control. Follow up applications will likely be needed to spray individual rosettes that may have been missed during the initial application.

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## References

Turnage, G. and C. M. Shoemaker. 2018. 2017 survey of aquatic plant species in Mississippi waterbodies. Geosystems Research Institute, Mississippi State University, Mississippi State, MS. February 2018. GRI Report # 5077. Pp. 69.

Turnage, G. 2019. A Brief Introduction to Factors Affecting Water Quality, Aquatic Weed Control, Herbicide Labels, & Mixing Calculations. Mississippi State University, Geosystems Research Institute Report #5084. Pp. 25.

Turnage, G., A Lazaro-Lobo, S. L. Sanders, and M. Thomas. 2019. 2019 survey of aquatic plant species in Mississippi waterbodies. Geosystems Research Institute, Mississippi State University, Mississippi State, MS. February 2018. GRI Report # 5085. Pp. 35.

Madsen, J.D. and W. Robles. 2009. Water hyacinth (*Eichhornia crassipes* (Mart.) Solms) MSU GRI Factsheet. Pp. 2.

## Tables and Figures

Table 1. Chemical control strategies (submersed application rates) adapted from Madsen and Robles (2009); the first row for each herbicide is the amount of product needed for commercial applications (100-gal solution), the second row is the amount of product needed for private landowners (25-gal of solution; typical ATV sprayer size); all rates are in imperial units (see Turnage 2019 for instructions on calculating ac-ft; and to gain a greater understanding of how aquatic plant management and aquatic ecosystem processes affect each other); herbicide will move to a constant concentration in the waterbody after application.

| HERBICIDE | SPOT RATE | BROADCAST RATE | SURFACTANT | NOTES |
|---|---|---|---|---|
| 2,4-D | 0.5% | 0.5 gal/ac | 0.5% (0.5 gal) | Foliar method |
| | | 1 pt | 1 pt | |
| Diquat | 1.0% | 1 gal/ac | 0.5% (0.5 gal) | Foliar method |
| | | 1 qt | 1 pt | |
| Glyphosate | 1.0% | 1 gal/ac | 1% (1 gal) | Foliar method |
| | | 1 qt | 1 qt | |
| Imazapyr | 0.25% | 1 qt/ac | 0.25% (1 qt) | Foliar method |
| | | 1 cup | 1 cup | |
| Triclopyr | 2.0% | 2 gal/ac | 0.5% (0.5 gal) | Foliar method |
| | | 2 qts | 1 pt | |

*****2,4-D rates are based on a 1.74 lb/gal formulation, diquat rates are based on a 3.73 lb/gal formulation, glyphosate rates are based on a 5.4 lb/gal formulation, imazapyr rates are based on a 2.0 lb/gal formulation, and triclopyr rates are based on a 3.0 lb/gal formulation; see Turnage (2019) regarding herbicide labels and formulation determination.

†This table is meant to be an aid in mixing herbicide solutions; it is not meant to be used as a replacement for herbicide label recommendations.

Figure 1. Image of water hyacinth covering a waterbody (left), flower (center), and mother and daughter plants (right). Images courtesy of J. Madsen and W. Robles (2009).

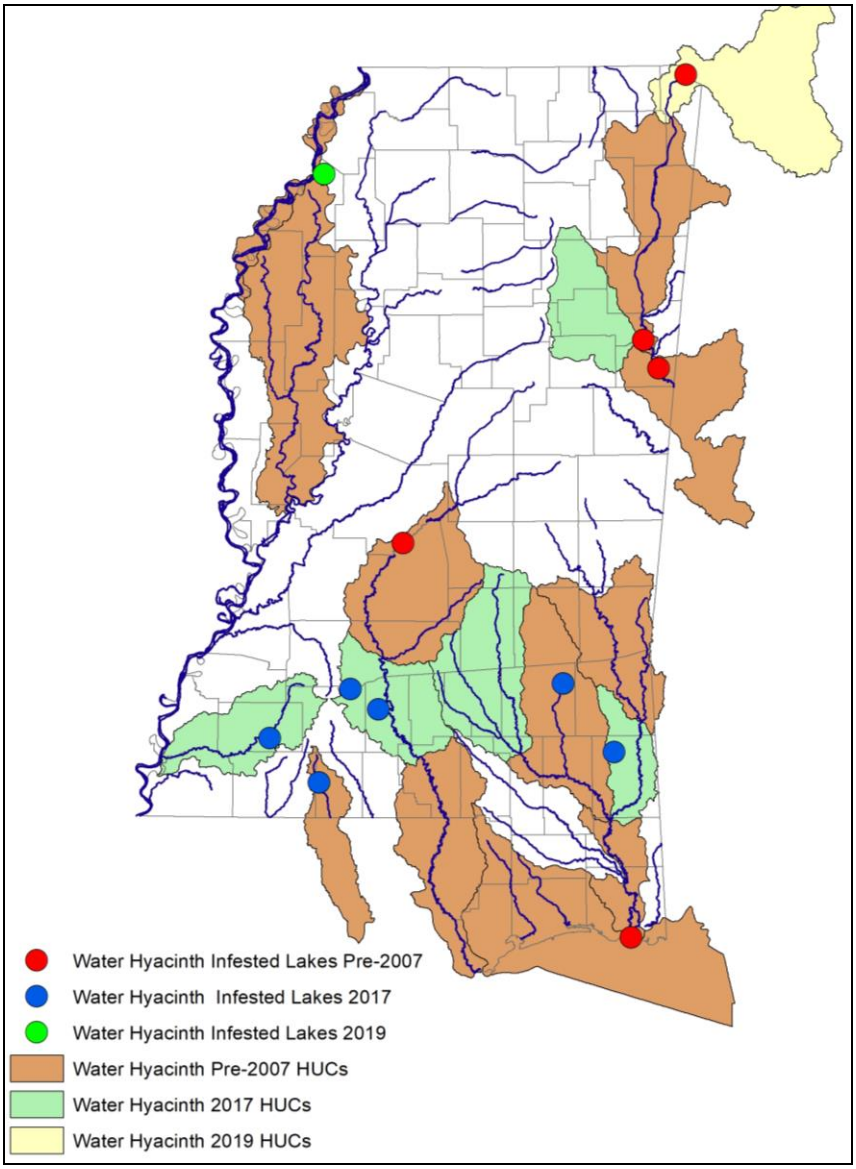


Figure 2. Mississippi Hydrologic Units and waterbodies infested by water hyacinth according to surveys by Turnage and Shoemaker (2018) and Turnage et al. (2019). Hydrologic units are based on HUC 8 codes.

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