

Journal of Aquatic Plant Management – Volume 57, 2019

January

The response of giant salvinia to foliar herbicide applications at three winter timings

Bradley T. Sartain and Christopher R. Mudge 1-6

The growth habits of giant salvinia (*Salvinia molesta* D.S. Mitchell) make it difficult to get adequate coverage and control with foliar-applied herbicides during the growing season. Winter may be an opportune time for natural resource managers to use foliar-applied herbicides to achieve favorable control without making multiple applications throughout the growing season. Therefore, outdoor mesocosm trials were conducted to investigate the efficacy of the aquatic herbicides glyphosate, diquat, flumioxazin, and glyphosate+diquat against mature giant salvinia during the winter of 2015 to 2016 (yr 1) and 2016 to 2017 (yr 2). Dry wt data 12 wk after the February application showed no significant herbicide treatment by application timing interaction. However, significant differences were noted for herbicide treatment and application timing in yr 1, but not yr 2. Plant response in yr 1 and 2 varied significantly because of dissimilar environmental conditions (i.e., yr 2 plants being exposed to colder temperatures for longer periods). Diquat, flumioxazin, glyphosate, and glyphosate + diquat treatments reduced giant salvinia biomass by 27, 45, 55, and 55%, respectively. Applications during January and February resulted in greater control than those applied in December (47 and 50% vs. 33%, respectively). Year 2 giant salvinia control was $\geq 99\%$ for all herbicide treatments and application timings. Herbicide applications, in combination with extended periods of subfreezing temperatures, can increase giant salvinia control during the winter. In the event of a milder winter, in which temperatures do not remain at or below freezing for a consecutive ≥ 9 h, herbicide applications just before a minor freeze event can increase herbicide efficacy. However, applications of contact herbicides to freeze-damaged fronds later in the winter can lead to decreased control because of minimal healthy plant material being contacted with herbicide solution.

Key words: biomass, diquat, flumioxazin, freeze, glyphosate, mesocosm, timing.