

Journal of Aquatic Plant Management – Volume 57, 2019

January

Field site analysis of giant salvinia nitrogen content and salvinia weevil density

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In 2012, a giant salvinia (*Salvinia molesta* Mitchell) biological control project was initiated in Louisiana. Although similar quantities of salvinia weevils (*Cyrtobagous salviniae* Calder and Sands) were released at all sites, weevil densities were highly variable among sites. In addition, signs of plant nitrogen depletion (yellowing plants) were observed at some sites. Because it is well known that plant nutrition can affect the success of a biocontrol agent because of slowed development and/or reduced fecundity, the correlation between giant salvinia nitrogen content and salvinia weevil density was investigated during the growing seasons of the second (2013) and fourth (2015) years. During 2013, weevils were reintroduced to sites, and the magnitude of adult weevil density increase varied by site. Adult densities at Upper Big Break were 6-fold greater than at all other sites. Larval densities did not change over time, but at Upper Big Break, they were, on average, 10-fold greater than at other sites. Giant salvinia nitrogen content varied among sites and sampling dates, and Upper Big Break plants had greater nitrogen than all other sites during 75% of sampling dates. Additionally, adult and larval densities were significantly correlated to plant nitrogen content. During 2015, trends were less distinct and weevil densities and nitrogen content varied based on the interaction between sampling date and site, but a significant correlation was not detected. Results from 1-yr of a 2-yr study confirmed published reports of the importance of plant nitrogen content to salvinia weevil productivity. Additional studies are warranted to evaluate and understand the role of nitrogen at giant salvinia biocontrol field sites.

Key words: biological control, *Cyrtobagous salviniae*, invasive species management, *Salvinia molesta*.