Using contact herbicides for control of duckweed and watermeal with implications for management

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Floating plants like duckweed (*Lemna minor* L.) and watermeal (*Wolffia columbiana* Karst) are becoming wide-spread problems in waterways in the United States. Both species can be difficult to control as they are capable of rapidly recolonizing a site after management efforts have been implemented. Unaffected plants can drift into the site or, due to their small size, plants are missed during herbicide applications. Flumioxazin and diquat are two contact herbicides that are recommended for managing watermeal and duckweed. Although published literature exists in support of diquat use, there is little published literature for flumioxazin use on watermeal and no published literature in support of its use in managing duckweed. Greenhouse, mesocosm, and field trials were conducted to evaluate the efficacy of both herbicides on watermeal and duckweed in order to document flumioxazin efficacy in the literature. Foliar applications of flumioxazin (105 g ai ha^{-1}, 211 g ai ha^{-1}, and 422 g ai ha^{-1}) and diquat (2,255 g ai ha^{-1}) were evaluated in the greenhouse and mesocosm trials. Based on results from the greenhouse and mesocosm trials only the 422 g ai ha^{-1} rate of flumioxazin and diquat were evaluated in separate ponds. At 4 wk after treatment, all rates of flumioxazin reduced duckweed biomass compared to nontreated reference plants. Water- meal control was more variable in that only the 422 g ai ha^{-1} flumioxazin treatment provided a significant reduction in biomass in the greenhouse study, but no reductions were observed in the mesocosm study. When these herbicides were applied to ponds, flumioxazin and diquat reduced floating plant biomass by 96 and 93%, respectively. However, when managing a mixed community of floating plants that contains watermeal using either diquat or flumioxazin, managers would likely release watermeal as it was the only plant that survived the pond trials. A follow-up application would be needed to eliminate watermeal from the water body.