

Response of parrotfeather watermilfoil and alligatorweed to foliar florpyrauxifen-benzyl applications

ANDREW W. HOWELL, DEBORAH E. HOFSTRA, MARK A. HEILMAN, AND ROBERT J. RICHARDSON*

ABSTRACT

The emergent aquatic plants, parrotfeather watermilfoil [*Myriophyllum aquaticum* (Vell.) Verdc.] and alligatorweed [*Alternanthera philoxeroides* (Mart.) Griseb.] threaten native ecosystem services within invaded regions throughout the world. The registration of the auxin herbicide, florpyrauxifen-benzyl, in the United States provides water resource managers with another herbicide for weed control. Currently, available aquatic herbicides do not control these marginal weed species with consistency. Research was conducted in the United States (North Carolina) and New Zealand to evaluate foliar applications of florpyrauxifen-benzyl for parrotfeather watermilfoil and alligatorweed control. Greenhouse and outdoor mesocosm studies indicated single foliar applications of florpyrauxifen-benzyl provided > 90% parrotfeather watermilfoil control 4 and 8 wk after treatment (WAT) at rates ≥ 29.4 g ai ha⁻¹. Alligatorweed was less sensitive than parrotfeather watermilfoil at the same tested rates in both greenhouse and outdoor mesocosm environments, and repeat applications of florpyrauxifen-benzyl at 29.4 to 58.8 g ai ha⁻¹ were necessary to achieve > 94% alligatorweed control 12 WAT. Both parrotfeather watermilfoil and alligatorweed plants displayed signs of recovery when exposed to the lowest herbicide rate (14.7 g ai ha⁻¹) evaluated. Therefore, operational florpyrauxifen-benzyl applications of < 29.4 g ai ha⁻¹ are discouraged for herbicide resistance management. Future research should screen additional aquatic herbicides as potential tank mix partners for improving alligatorweed control longevity from a single florpyrauxifen-benzyl treatment. Water resource managers would additionally benefit from studies evaluating florpyrauxifen-benzyl foliar plus directed in-water application strategies to simulate common emergent plant control scenarios.

Key words: *Alternanthera philoxeroides* (Mart.) Griseb., aquatic, emergent, invasive, *Myriophyllum aquaticum* (Vell.) Verdc.

*First and fourth authors: Graduate Research Assistant, Professor, Department of Crop and Soil Sciences, North Carolina State University, Campus Box 7620, Raleigh, NC 27695. Second author: Programme Leader, National Institute of Water and Atmospheric Research, P.O. Box 11115, Hillcrest, Hamilton, New Zealand. Third author: Director of Aquatic Technology, SePRO Corporation, 11550 North Meridian St, Suite 600, Carmel, IN 46032. *Corresponding author's E-mail: rob_richardson@ncsu.edu. Received for publication December 8, 2021 and in revised form June 8, 2022.