

1. Do applications of systemic herbicides when green fruit are present prevent seed production or viability of *Alliaria petiolata* (garlic mustard)?

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4. Abstract

Alliaria petiolata (garlic mustard) is an invasive herbaceous monocarpic perennial in the United States, causing extensive negative impacts to forest understory flora. Rosettes are typically targeted for management with herbicides, but often land managers miss the optimal application timing window. This short timing window makes managers reliant on hand removal or mowing to control flowering plants and prevent seed production. As *A. petiolata* infestations in the upper-Midwest frequently prove too extensive to adequately address with these time-consuming techniques, we evaluated the effectiveness of foliar herbicide applications to prevent seed production and viability, in order to expand control options for managers. We tested the effectiveness of glyphosate (3% volume/volume of a 39.8% acid equivalent formulation) and triclopyr (1% volume/volume of a 31.8% acid equivalent formulation) foliar applications applied when petals were dehiscing and green fruit were developing. Experiments were conducted at three upper-Midwestern locations in replicated randomized complete block experiments (3-4 blocks), and glyphosate and triclopyr treatments were compared to untreated controls.

Across locations, applications of glyphosate and triclopyr reduced the overall number of seed produced by an average of 51% (18-74%). Additionally, these treatments reduced the viability of seed by an average of 62% (32-80%). While triclopyr reduced seed viability more than glyphosate, glyphosate treatments resulted in less seed. Thus, both herbicides reduced but did not eliminate the number of viable seed (average of 90% viable seed reduction, range 70-99%). Because treatments did not consistently eliminate viable seed, results suggest that this technique should only be utilized if other methods that more successfully prevent seed production cannot be utilized.

5. Speaker Bio

Leo Roth has been an Associate Outreach Specialist in Professor Mark Renz's weed science laboratory at the University of Wisconsin — Madison for the past year, with an emphasis on conducting herbicide efficacy trials in natural areas and agronomic settings. Leo received an undergraduate degree in geography and environmental studies from the University of Wisconsin — Madison, interfacing with invasive species management and research throughout his undergraduate and post-graduation career. To learn more about the Renz Lab's research on invasive plant control and native forb establishment, visit <https://renzweedscience.cals.wisc.edu/>.