

Early detection and rapid response to Palmer amaranth and waterhemp

AT A GLANCE

Palmer amaranth and waterhemp are threatening crop production in Idaho. Educating stakeholders is critical for early detection and rapid response.

The Situation

Palmer amaranth and waterhemp are both native to the United States. However, these weeds have risen from less known weeds to the most devastating weeds in crop production across several states of the United States. These two pigweeds have developed resistance to nearly ten herbicide families commonly used in agronomic crops. These herbicide families encompass herbicides commonly used in alfalfa, corn, dry beans, potatoes, sugar beets, small grains and many other crops. In crops such as sugar beets and dry beans, it is nearly impossible to effectively control these pigweeds in the states where they have been established. Research from states where these weeds have recently been introduced suggests that just one Palmer amaranth within 3 ft of crop row can cause 80% yield loss in sugar beets and 77% yield loss in dry beans. Because of the threat these invasive pigweeds pose to Idaho agriculture, there is an urgent need to educate stakeholders on how to identify these pigweeds and the best management practices to ensure that these pigweeds do not become established in Idaho.

Our Response

A team of UI Extension faculty led by Albert Adjesiwor, Extension weed specialist, in collaboration



Palmer amaranth (left) and waterhemp (right) in potato in Owyhee and Minidoka County.

with Clarke Alder (Amalgamated Sugar), Joel Felix (Oregon State University) and other stakeholders launched an extensive educational program across the state. Beginning in 2021, we developed educational materials (e.g., [Pigweeds: Current and emerging weed threats in the Pacific Northwest, PNW 758](#)) that have been widely distributed to stakeholders regarding identifying features of these pigweeds. We have given more than 50 presentations (4,000+ direct contacts) at various in-person and virtual stakeholder conferences and meetings. In addition, we have had live demonstrations of how to identify these pigweeds at field days, weed tours, county fairs and other educational events across southern Idaho.

Program Outcomes

More than 90% of the respondents to our pre- and post-educational presentation surveys indicated an increase in knowledge and their ability to identify Palmer amaranth and waterhemp. Nearly 100 Palmer amaranth and four waterhemp infestations have been confirmed and mapped since this education program began. As of the summer of 2024, we positively identified approximately 3,600 impacted acres across Southern Idaho. Samples were collected from 32 Palmer amaranth infestations to screen for herbicide resistance. Glyphosate resistance was confirmed in Idaho Palmer amaranth in 2023, with nearly 80% of the collected samples being resistant to glyphosate and 22% testing resistant to ALS inhibitors (Group two herbicides). All three waterhemp samples (100%) tested positive for resistance to glyphosate and ALS inhibitors (Group two herbicides). Additional bioassays in the greenhouse confirmed reduced control of Palmer amaranth by Group four herbicides (e.g., 2,4-D and dicamba) and Group 27 herbicides.

Data collected from farmers showed a sugar beet yield loss per acre of approximately 47% at the current Palmer infestation levels. Data from this educational program were used by Amalgamated Sugar and the Idaho State Department of Agriculture to apply for Section 18 Emergency Use Label for metamitron (Goltix 700 SC) to enable sugar beet growers to control

glyphosate-resistant Palmer amaranth. This is anticipated to enable sugar beet growers in Idaho to use metamitron in the 2025 cropping season to control Palmer amaranth.

The Future

All seeds collected from Palmer amaranth and waterhemp from infested fields across southern Idaho are currently being screened for resistance to commonly used herbicides in crops such as dry beans, potatoes and corn, to determine which herbicides will provide good control of these pigweeds. We are currently developing “quick facts” and “management guides” for these pigweeds. This will be distributed to stakeholders across the state. We plan to keep conducting surveys to detect the extent of spread of these pigweeds.

Cooperators and Co-Sponsors

This educational program would not have been possible or successful without the cooperation of Amalgamated Sugar agronomists and fieldmen as well as Joel Felix, Ph.D. (Oregon State University). Special thanks go to Clarke Alder (Amalgamated Sugar) for his tireless effort to move this educational program forward. We also thank Amalgamated Sugar, Snake River Sugar Beet Research and Seed Alliance, Northwest Potato Research Consortium and other stakeholders for their support.

FOR MORE INFORMATION

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