8 Tips for Reducing the Development of Herbicide-Resistant Weeds

Glyphosate resistant kochia in sugar beet.

1. *Target your weeds* by using the right product at the right timing, usually when weeds are less than 3-4" tall.

2. *Apply the labeled rate*. Don't risk sub-par control by using a rate that is too low to control the target weeds.

3. *Use multiple modes of action* to control the same weeds.

4. *Control escapes immediately* through cultivation, spot spraying, or manual removal to prevent escapes from producing seed.

5. *Control the same weeds differently* in every crop in the rotation. Integrated weed management will help to reduce the resistance potential within each crop.

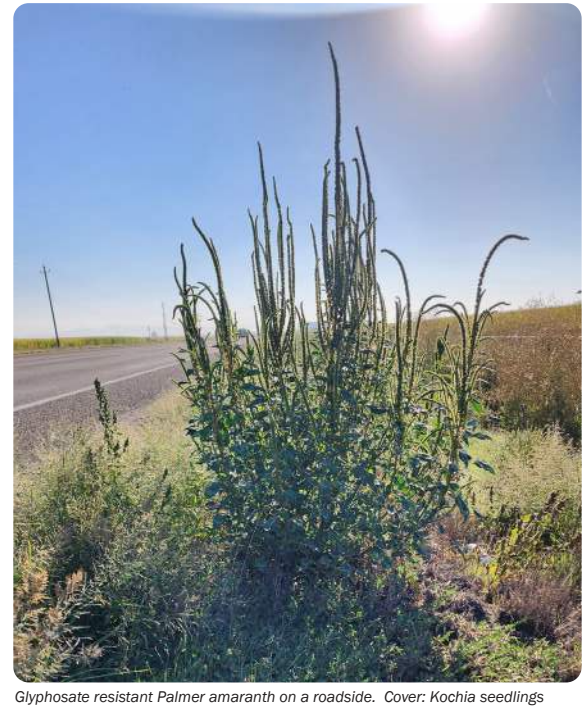
6. *Avoid growing multiple Roundup Ready® crops* back-to-back in the rotation to discourage the development of glyphosate resistance.

7. *Investigate*. If a weed or patch looks out of place, it probably is and should be treated as such. Too often escapes are discounted as a "sprayer skip" or "dust on the sprayer tires". Take note of conditions in the rest of the field.

8. *Document any existing resistance* on the farm. This allows treatment of those areas specific to those biotypes and will deter repeat applications of chemistries that no longer work.

For further information on herbicide resistance:

International Herbicide Resistant Weed Database
www.weedscience.org
Western Society of Weed Science
www.wsweedscience.org
Weed Science Society of America
www.wssa.net
Take Action/The United Soybean Board
takeactiononweeds.com
Herbicide Resistance Action Committee
www.hracglobal.com



Glyphosate resistant Palmer amaranth on a roadside. Cover: Kochia seedlings cover an Idaho field in early March. All photos by Clarke Alder.

2023-24 WSWS HRP Committee:

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www.weedscience.org

WASHINGTON STATE UNIVERSITY

Amalgamated Sugar

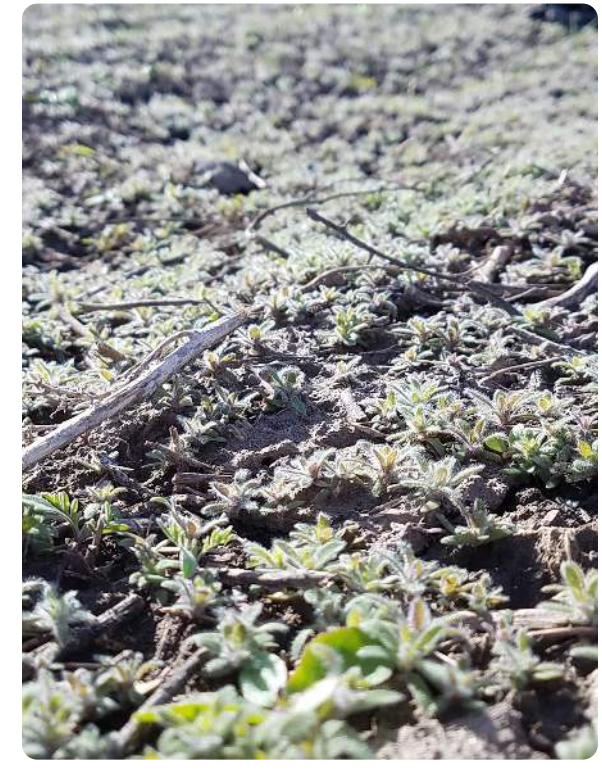
MONTANA STATE UNIVERSITY

KANSAS STATE UNIVERSITY

WESTERN SOCIETY OF WEED SCIENCE

Documenting Herbicide-Resistant Weeds

Criteria and Process



Herbicide Resistant Plants Committee
2023-2024

WSWS Herbicide Resistant Plants Committee: Encouraging Submissions to www.weedscience.org

The WSWS Herbicide Resistant Plants Committee has been crucial to researching and understanding herbicide-resistant weeds, however, simple annual surveys are inefficient for collecting and maintaining more realtime data. To solve this issue, the committee is encouraging the submission of cases to the International Survey of Herbicide Resistant Weeds website, www.weedscience.org.

This website is a collaborative effort among weed scientists in over 80 countries from government, academia, and industry fields. By submitting cases to this central location, the reporting of herbicide-resistant weeds can remain up-to-date and scientifically accurate, providing a more effective approach than conducting annual surveys.

Through contributing to the database, researchers and industry professionals become part of a wider network promoting cooperation and collaboration among those conducting herbicide resistance studies. These contributions help ensure the scientific accuracy of the database and provide the latest and most accurate information to interested parties.

To help facilitate these efforts, the following pages in this pamphlet highlight the process for submitting cases of herbicide-resistant weeds to the database, including information required for case submission and how to access the submission portal.

The committee hopes that by providing this helpful resource, more individuals will be encouraged to contribute to the database and help advance our understanding of herbicide-resistant weeds.

Sincerely,

WSWS Herbicide Resistant Plants Committee
2023-2024

Criteria for Documentation of Herbicide Resistant Weeds

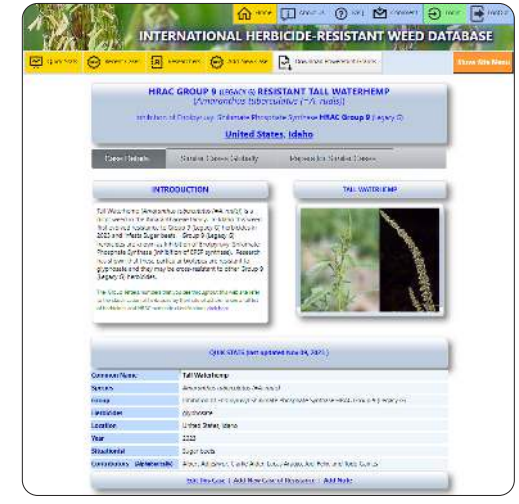
The *International Survey of Herbicide-Resistant Weeds* uses five criteria to document new cases of herbicide-resistant weeds:

1. *Resistance Definition:* The weed must meet the Weed Science Society of America (WSSA) definition of resistance, which is “the inherited ability of a plant to survive and reproduce following exposure to a dose of herbicide normally lethal to the wild type.”
2. *Scientific Confirmation:* The resistance must be confirmed using acceptable scientific protocols, including replicated field trials or greenhouse experiments.
3. *Heritability:* The resistance must be heritable, meaning that it is passed down from one generation to the next.
4. *Field Impact:* The resistant weed must have practical field impact, reducing crop yields or increasing weed control costs.
5. *Species Identification:* The weed must be identified as a problem at the species level - not the result of deliberate or artificial selection.

If a weed biotype fails to conform to any one of these criteria, it will not be posted on the website. Additional information on documenting resistance can be found directly on the website www.weedscience.org.

Palmer amaranth along the edge of a potato field in Idaho.

Process for Submission of Cases of Herbicide Resistant Weeds to www.weedscience.org



1. Collect all relevant information about the new resistance case, including the weed species, GPS location, and herbicide(s) used.
2. Write a detailed description of the new resistance case, including the history of herbicide(s) used in the affected area, the development of resistance, and any management practices used to control the resistant weed(s).
3. Email the details of the new resistance case to Dr. Ian Heap at IanHeap@weedscience.org. Be sure to include all relevant information in your email.
4. The information will be reviewed by the *International Survey of Herbicide Resistant Weeds* website’s expert team, who will validate the information and add it to the global herbicide-resistant weed database, if it meets the criteria for inclusion.
5. Once the new resistance case is added to the database, it will be available on the www.weedscience.org website for researchers and other interested parties to access and study.