Herbicide resistant weeds are a growing concern for MI growers due to the recent occurrence and spread of glyphosate-resistant horseweed, Palmer amaranth, common waterhemp, common ragweed, and the occasional failure to control common lambsquarters and giant ragweed.

Confirming herbicide resistance in weed populations is the first step of any resistance management program and will provide producers with knowledge to implement best management practices to prevent the spread of these resistant weeds.

Greenhouse bioassays are required to confirm herbicide resistance in weeds, making it vital that mature seed samples are collected and properly packaged for submission to MSU Diagnostic Services.

<table>
<thead>
<tr>
<th>Table 1. Seed shapes, colors, sizes and locations for common Michigan weeds.</th>
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<tbody>
<tr>
<td><strong>Seed shape</strong></td>
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<tr>
<td>Palmer amaranth, waterhemp</td>
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<tr>
<td>Powell amaranth, redroot pigweed</td>
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<tr>
<td>Horseweed/ marestail</td>
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<tr>
<td>Common ragweed</td>
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<tr>
<td>Giant ragweed</td>
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<tr>
<td>Common lambsquarters</td>
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</table>
Tips for Collecting Weed Seeds

Palmer amaranth and common waterhemp

Female plant with seeds  Male plants do not have seeds

Horseweed/marestail

Mature horseweed plant with “fluff”  Immature horseweed seed  Mature horseweed seed
Tips for Collecting Weed Seeds

Common and giant ragweed

Not here!

Seeds located in leaf axils, not top of plant

Common ragweed seeds

Common lambsquarters

Brown or black seed is formed at the top of the plant and end of branches
Tips for Collecting Weed Seeds

Submitting samples for herbicide resistance screening

1) Check for the presence of mature seed (see previous photos and descriptions)

2) Collect seed from 5 plants or more from the same field and group together; this ensures there is enough for testing

3) Carefully package seed
   - Seal in paper bags (plastic promotes mold growth)
   - Double contain in a sealed cardboard box

4) Fill out the submission form found at pestid.msu.edu
   - “MSPC Herbicide Resistance Submittal Form” located in the Forms section
   - Please note the location where the seeds were collected, in addition to the addresses where you would like results mailed and emailed

5) Bring the sample(s) in person or mail to the following address:
   Diagnostic Services
   578 Wilson Rd., Room 107
   East Lansing, MI 48824-6469
   (517) 355-4536

6) For current pricing please check the ‘Services & Fees’ at pestid.msu.edu

Process and results

The herbicide resistance screening process includes the following tasks:
- Seed cleaning
- Dormancy breaking measures (6 winter weeks for ragweed species)
- Initial growth and transplanting
- Herbicide application
- Rating 2 weeks after the application

Therefore, results are available 3-4 months after submission, some times longer, depending on the number of samples received.