

Suspect you have herbicide resistant weeds? Participate in a genetic testing sampling project.
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Do you suspect that you have herbicide resistant weeds on your farm? If so, why not get them tested for free through a genetic testing sample project. So far there are 16 (5 more in progress) genetic quick tests to assist in identifying herbicide resistance in 12 weed species. Some of these tests were implemented from scientific literature. Two are new discoveries. These tests deliver a diagnostic and a recommendation to the grower within the same growing season. Traditional resistance testing in the greenhouse can take from three months to a year to get results back to growers. Now, leaf tissue instead of seed is collected. DNA is extracted from the leaf tissue to determine if there is a change in the sequencing resulting in a mutation conferring resistance.

Tests have also been developed to differentiate between *Brassica* and *Amaranthus* (pigweed) species. Tests differentiating pigweed species have been instrumental in confirming new cases of waterhemp in Ontario (25), Manitoba (7) and Quebec (9). Once confirmed, the waterhemp was tested for Groups 2, 5, 9 and 14 resistances.

Table 1. Genetic Tests Available

Weed Species	Herbicide Group	Resistance & Tests
Large crabgrass	1	Target-site: ACCase gene amplification
Common chickweed	2	Target-site (P197Q & unpublished)
Common ragweed	2	Target-site (W574L)
Eastern black nightshade	2	Target-site (A205V)
Green pigweed	2	Target-site (S653N & W574L)
Giant foxtail	2	Target-site (unpublished)
Redroot pigweed	2	Target-site (S653N & W574L)
Waterhemp	2	Target-site (S653N & W574L)
Common ragweed	5&7	Target-site (V219I)
Green pigweed	5&7	Target-site (A251V, S264G**, V219I & F274L)
Lamb's-quarters	5	Target-site (S264G)
Redroot pigweed	5&7	Target-site (A251V, S264G**, V219I & F274L)
Waterhemp	5&7	Target-site (A251V, S264G**, V219I & F274L)
Brassica spp.	9	Presence of transgene
Canada fleabane	9	Target-site (P106S)
Waterhemp	9	Target-site: EPSPS gene amplification
Waterhemp	14	Target-site (Δ G210 in PPX2L)
Amaranthus spp.	-	Species identification
Brassica spp.	-	Species identification

*Several of these tests were developed by other researchers (Francois Tardif) and reproduced from the scientific literature.

**S264G mutation only induces resistance to Group 5 herbicides, not Group 7

If you suspect you have any of the above herbicide resistant weeds and would like to get your fields tested for free (through project funding) contact: Kristen Obeid for sample collection kits and sampling protocols
kristen.obeid@ontario.ca
519-965-0107

DUE TO COVID-19 we have a new process this year.

**Samples need to be sent directly to the lab and a submission form filled in on-line at:
www.harvestgenomics.ca**

**Harvest Genomics
c/o Chris Grainger
5420 Highway 6 N, Orchard Park
Guelph, Ontario
N1H 6J2**

519-635-4470

For all samples, please send an email to myself and Chris Grainger to let us know that a sample is being sent to the lab. Please document the tracking number of the package in the email.

If you would like to drop off a sample to the lab you must call ahead and let Chris Grainger know it is coming.

Collaborators:

- Ontario Ministry of Agriculture Food and Rural Affairs: Kristen Obeid and Mike Cowbrough
- Saint-Jean-sur-Richelieu Research and Development Centre: Dr. Marie Josée Simard and Dr. Martin Laforest
- Harrow Research and Development Centre: Dr. Robert Nurse and Dr. Eric Page
- Pest Management Centre: Dr. Cezarina Kora
- Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) Pest Diagnostic Lab: David Miville
- University of Guelph: Dr. Darren Robinson and Dr. Peter Sikkema
- Since September 2019: Ontario Fruit and Vegetable Growers Association, Ontario Apple Growers, Fresh Vegetable Growers of Ontario, Ontario Processing Vegetable Growers, Bayer, FMC and Syngenta Canada.

This project was partly funded through the Pest Management Centre's [Pesticide Risk Reduction Program](#).