



Wednesday, April 15, 2020

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## Waterhemp: A Spreading Invasive Weed in Ontario and Canada

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Waterhemp (*Amaranthus tuberculatus* var. *rudis*) is a relatively new weed in Canadian agriculture cropping systems<sup>1</sup>. It has been suggested that it was introduced via a combine from the southern United States between the late 1990s and early 2000s in Ontario<sup>1</sup> and similarly to Quebec in 2017.

### “In This Issue”

- ♦ Waterhemp: A Spreading Invasive Weed in Ontario and Canada
- ♦ Expiring Pesticide Certification Extension

Waterhemp is a small seeded, summer annual, broadleaf weed with many traits which make it particularly troublesome in agriculture<sup>2</sup>:

1. Waterhemp can emerge throughout the entire growing season (in Ontario)
2. One female plant can produce up to 4.8 million seeds<sup>3</sup> in a non-competitive environment
3. Waterhemp is dioecious (male and female plants), which results in vast genetic diversity contributing to rapid herbicide resistance evolution due to obligate outcrossing, unlike most other *Amaranthus* species<sup>1</sup>
4. Waterhemp is extremely difficult to differentiate from other *Amaranthus* species, especially when small. However, there are a few key differences, as illustrated in Figures 1 and 2:
  - Waterhemp cotyledons are often more egg-shaped than the long, linear cotyledons of other *Amaranthus* species.
  - The first true leaves of waterhemp are generally longer and more lance-shaped.
  - Waterhemp seedlings are hairless with leaves that look waxy or glossy.
  - Waterhemp stems are hairless.

# Waterhemp: A Spreading Invasive Weed in Ontario and Canada...con't

**Figure 1. *Amaranthus* species seedlings**

Photo credits: P. Smith and C. Shropshire



Waterhemp



Green Pigweed



Redroot Pigweed

**Figure 2. *Amaranthus* species stems.**

Photo credit: C. Shropshire



Waterhemp



Green Pigweed



Redroot Pigweed

**Figure 3. Waterhemp plant**

Photo credit: C. Willemse

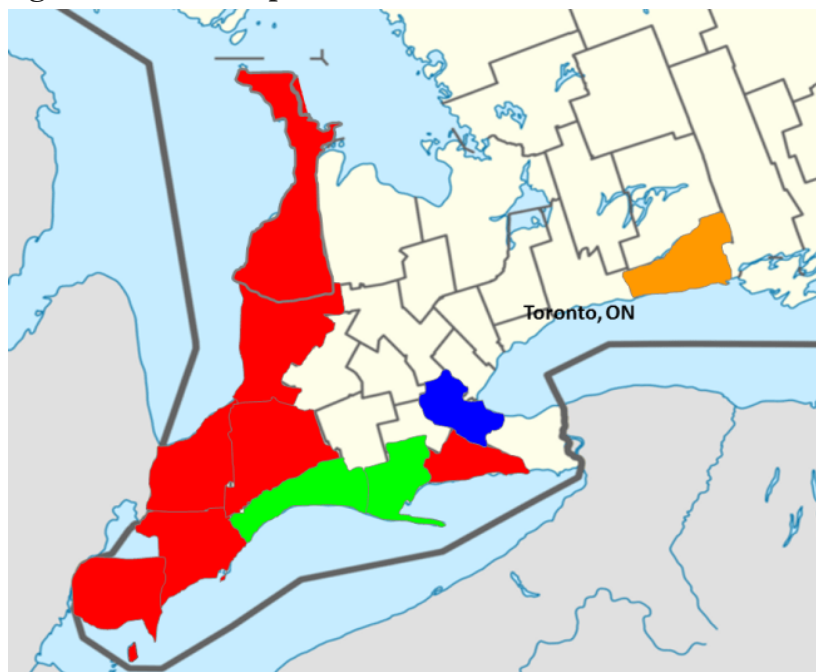


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An *Amaranthus* genetic test has been developed to differentiate between 6 species (green pigweed, redroot pigweed, palmer amaranth, smooth pigweed, tumble pigweed and waterhemp), and can be used if identification is uncertain. A pigweed species identification guide has also been developed. Contact [kristen.obeid@ontario.ca](mailto:kristen.obeid@ontario.ca) for either resource.

The first case of glyphosate-resistant waterhemp was discovered in Lambton county in 2014. This population was the first confirmed glyphosate-resistant waterhemp in Canada. Since then, waterhemp has been found in 11 Ontario counties, 7 of which have fields with populations that are 4-way resistant to herbicide groups 2, 5, 9 and 14. In 2019, the genetic test which differentiates *Amaranthus* species was instrumental in confirming new waterhemp populations in Ontario (25), Manitoba (7) and Quebec (8). Multiple-resistant waterhemp has now been confirmed in vegetable fields in Elgin and Norfolk (Groups 2, 9 & 14) counties.

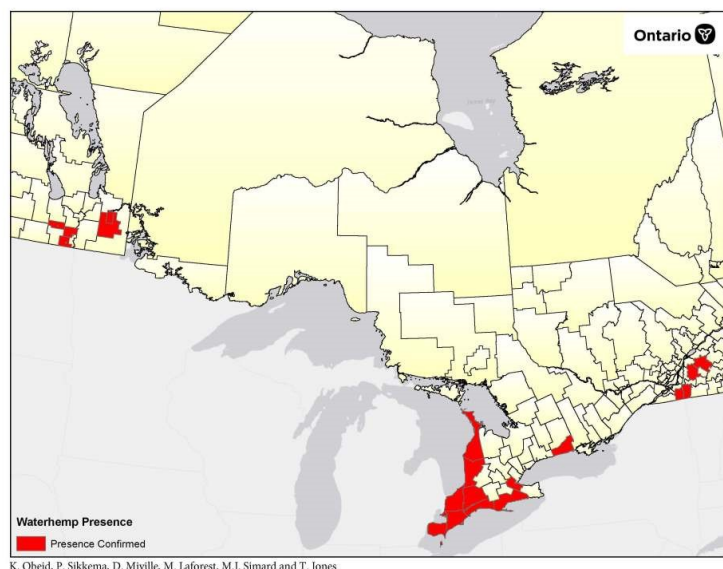
**Figure 4. Waterhemp Resistance and Distribution in Ontario**



| Label Colour | Herbicide Resistance Groups |
|--------------|-----------------------------|
| ORANGE       | 2, 9                        |
| BLUE         | 2, 5, 9                     |
| GREEN        | 2, 9, 14                    |
| RED          | 2, 5, 9, 14                 |

# Waterhemp: A Spreading Invasive Weed in Ontario and Canada...con't

Figure 5. Waterhemp Distribution in Canada



Waterhemp has the potential to become one of the most problematic weeds in Canada, as it is in the United States corn belt. It is easily spread to new areas as a contaminant of seed or hay, as a hitchhiker on vehicles or equipment and through natural dispersal by water and wildlife<sup>4</sup>. Once established, waterhemp will thrive in many agricultural production areas due to its prolific seed production, extended emergence pattern, high genetic diversity and its current documented herbicide resistance to Groups 2, 5, 9 and 14 (Ontario and Quebec) and Groups 2 and 9 (Manitoba).

## References

- <sup>1</sup> Costea, M., Weaver, S.E., and Tardif, F.J. 2005. the biology of invasive alien plants in Canada. 3. *Amaranthus tuberculatus* (Moq.) Sauer var. *rudis* (Sauer) Costea and Tardif. Can. J. Plant Sci. 85: 507-522.
- <sup>2</sup> Schryver, M.G., Soltani, N., Hooker, D.C., Tranel, P.J., and Sikkema, P.H. 2017. Glyphosate-resistant Waterhemp (*Amaranthus tuberculatus* var. *rudis*) in Ontario, Canada. Can. J. Plant Sci. 92: 1057-1067.
- <sup>3</sup> Hartzler, R.G., Battles, B.A., and Nordby, D. 2004. Effect of common Waterhemp (*Amaranthus rudis*) emergence date on growth and fecundity in soybean. Weed Sci. 52L 242-245.
- <sup>4</sup> USDA APHIS Weed Risk Assessment for *Amarantus palmeri* (Amaranthaceae) – Palmer's amaranth. 2020. [https://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/weeds/downloads/wra/amaranthus-palmeri.pdf](https://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/wra/amaranthus-palmeri.pdf)

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## Acknowledgements

The authors gratefully acknowledge the contribution to this work from agronomists, extension personnel, technicians and students. As well as, previous graduate students L. Benoit, B. Hedges and M. Schryver.

## Expiring Pesticide Certification Extension



Ministry of the Environment, Conservation and Parks (MECP) is extending the pesticide certification of those who have certificates expiring this year until December 31, 2020.

This is good news to those of you who have expiring certificates and have not been able to attend an online course. The letters below are also being emailed out to those impacted:

- Grower Pesticide Safety Course certificate(<https://onvegetables.com/wp-content/uploads/2020/04/Certification-extension-GPSC.pdf>)
- Pesticide Vendor Certification Course certificate(<https://onvegetables.com/wp-content/uploads/2020/04/Certification-extension-PVCC.pdf>)
- General Vendor(<https://onvegetables.com/wp-content/uploads/2020/04/Certification-extension-General-Vendor.pdf>)

OPEP has also released this press release(<https://onvegetables.com/wp-content/uploads/2020/04/Press-release-Pesticide-Safety-Certification.pdf>).

New producers will need to access the online courses that are currently available or contact OPEP(<https://www.opecp.ca/contact-us/>) for other arrangements:

Ontario Pesticide Education Program  
University of Guelph Ridgetown Campus  
120 Main Street East,  
Ridgetown, ON  
N0P 2C0  
1-800-652-8573, or 519-674-2230  
[rcopep@uoguelph.ca](mailto:rcopep@uoguelph.ca)

OPEP continues to look at options to improve their online course options and to do testing online.

Ministry of the Environment,  
Conservation and Parks

Ministère de l'Environnement, de  
la Protection de la nature et des Parcs



Technical Assessment and Standards  
Development Branch  
40 St. Clair Avenue West  
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Phone: 416.327.5519  
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Direction des évaluations techniques et de  
l'élaboration des normes  
40, avenue St. Clair Ouest  
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Toronto, ON M4V 1M2  
Tél: 416 .327.5519  
Télé: 416. 327.2936

April 9, 2020

Dear Certificate Holder,

The health and well-being of every Ontarian continues to be our number one priority. Since first learning of COVID-19, Ontario has taken decisive action to contain the spread of this new virus.

As the province works to keep Ontarians safe during this time, there have been mandatory closures of non-essential workplaces, such as ministry-approved examination sites, and there was also an emergency order prohibiting organized gatherings of more than five people. These measures support the Chief Medical Officer's direction for physical distancing to help contain the spread of COVID-19.

In order to assist the province with its continued efforts to contain the spread of COVID-19, the University of Guelph's Ridgetown Campus has cancelled all in-person courses and exams, including the Grower Pesticide Safety Course.

The Ministry of the Environment, Conservation and Parks is extending the validity of certain certificates whose holders are unable to renew their certificate during the COVID-19 outbreak.

The ministry continues to work with the university to assess alternative options to in-person courses and exams.

### **Extension of your certificate**

If you have a Grower Pesticide Safety Course certificate that expires on or after January 1, 2020, and you have not been able to complete the training and exams due to the COVID-19 outbreak, your certificate is now valid until December 31, 2020.

This letter serves as notice that the Director, under the authority of subsection 43 (1) (c) (i) of O. Reg. 63/09: General, made under the *Pesticides Act*, is extending the period of time within which you must have last successfully completed the course to December 31, 2020.

Please attach this letter to your existing Grower Pesticide Safety Course certificate as confirmation of the extension of your certificate's expiry date. This will allow you to purchase pesticides from vendors without interruption.

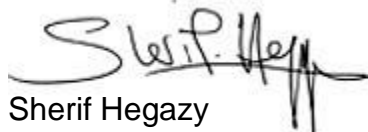
**Required action**

You do not need to take any further action at this time.

We appreciate your patience and understanding. We are all working together to combat this outbreak and hope that normal business operations will resume as soon as possible.

If you have any questions or inquiries, please direct them to [SDB-PesticideApproval@ontario.ca](mailto:SDB-PesticideApproval@ontario.ca).

Sincerely,

A handwritten signature in black ink, appearing to read 'Sherif Hegazy', with a stylized flourish at the end.

Sherif Hegazy  
Director under the *Pesticides Act*

cc: Jamie Sanders, Environmental Assessment and Permissions Division