

Posting: Master's student in weed science – 2026

Research project: Palmer amaranth in Canada: Competitiveness and early detection

Rationale: Amaranth species are prevalent in warm-season row crops like corn (*Zea mays*) (Heap, 2025a) and soybean (*Glycine max*) (Heap, 2025b). The northward expansion of prolific herbicide-resistant amaranth species into Canada is a threat to crop production (Agriculture and Agri-Food Canada, 2025). Water stress could limit the growth and reproductive potential of waterhemp (*Amaranthus tuberculatus*) (Sarangi et al., 2016), while temperature could limit the growth of Palmer amaranth (*Amaranthus palmeri*) (Ward et al., 2013). Palmer amaranth's photosynthetic rates are most efficient at temperatures around 38°C, but when temperatures drop to about 24°C, Palmer amaranth's photosynthetic rates are reduced by 50% (Ward et al., 2013). This research aims to collect relevant information to evaluate competition between *A. palmeri* and *A. tuberculatus*. Another objective of this research project is to advance methodologies for detecting the invasive Palmer amaranth and existing waterhemp pollen using environmental DNA (eDNA) analysis for early detection.

References

Agriculture and Agri-Food Canada, 2025. The amaranths are coming [WWW Document]. URL <https://agriculture.canada.ca/en/science/story-agricultural-science/scientific-achievements-agriculture/amaranths-are-coming> (accessed 6.21.25).

Heap, I., 2025a. Herbicide resistant weeds in corn (maize) globally [WWW Document]. Int. Herbic.-Resist. Weed Database. URL <https://www.weedscience.org/Pages/crop.aspx>

Heap, I., 2025b. Herbicide resistant weeds in soybean globally [WWW Document]. Int. Herbic.-Resist. Weed Database. URL <https://www.weedscience.org/Pages/crop.aspx>

Sarangi, D., Irmak, S., Lindquist, J.L., Knezevic, S.Z., Jhala, A.J., 2016. Effect of water stress on the growth and fecundity of common waterhemp (*Amaranthus rudis*). Weed Sci. 64, 42–52. <https://doi.org/10/f77rdb>

Ward, S.M., Webster, T.M., Steckel, L.E., 2013. Palmer Amaranth (*Amaranthus palmeri*): A Review. Weed Technol. 27, 12–27. <https://doi.org/10/gddc7p>

Goals:

- 1) Compare the competitiveness of palmer amaranth (*A. palmeri*) vs. waterhemp (*A. tuberculatus*) in canola (*Brassica napus*), wheat (*Triticum aestivum*) and soybeans.
- 2) Develop species specific (between *A. palmeri* and *A. tuberculatus*) markers to be tested on environmental DNA (eDNA) as early warning system of invasion by palmer amaranth

Supervisor: Dr. Huong Nguyen. McGill University, Sainte-Anne-de-Bellevue, Québec.

Co-supervisors: Dr. Marie-Josée Simard and Dr. Martin Laforest (Agriculture and Agri-Food Canada (AAFC) St-Jean-sur-Richelieu. [Saint-Jean-sur-Richelieu Research and Development Centre](#) | [Directory of scientists and professionals](#)

The student must be available to conduct sampling during the summer (mid-April – mid-September) at the AAFC research center in Saint-Jean-sur-Richelieu. Limited assistance from AAFC technicians is available.

Experimental sites: Greenhouses (St-Jean-sur-Richelieu), about 50 km from McGill University's Macdonald campus.

Master's project duration: 2 years (2026–2028). The student may join the project in January or May 2026.

Start of the Master's program: To be determined with the student (January or May 2026).

Salary: minimum \$20,000/year for 2 years. However, the student will be encouraged and supported to apply for additional Master's scholarships. Tuition and fees will be covered.

Desired qualifications:

- Interest and experience in research: attention to detail, organizational skills, and commitment to high-quality work.
- Valid driver's license and interest in working in greenhouses.
- Bachelor's degree in agronomy or any other relevant field.
- Excellent academic record (GPA > 3.5/4.33 an asset).

How to apply?:

Submit a cover letter, a curriculum vitae and an unofficial transcript at <https://forms.office.com/r/56rfZkcdye>

Expression of Interest – Palmer
amaranth in Canada: Competitive
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Deadline: September 1, 2025 (or later, until the position is filled). Note: Only selected candidates will be contacted for an interview.

All qualified applicants are encouraged to apply; however, in accordance with Canadian immigration requirements, Canadians and permanent residents will be given priority.