

Harmonized surveillance of common waterhemp (*Amaranthus tuberculatus*): A model of national collaboration

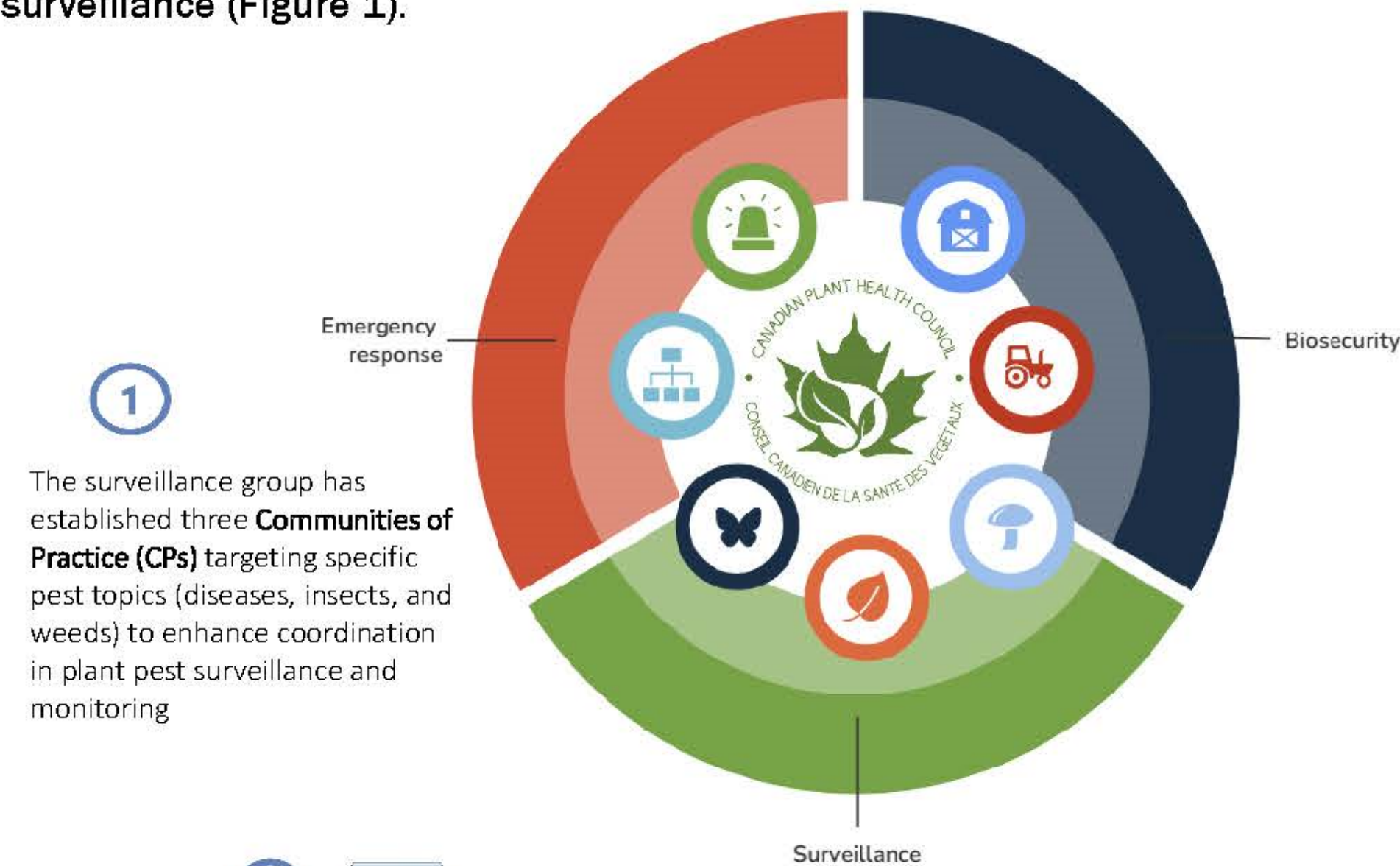
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INTRODUCTION

The Canadian Plant Health Council was launched in 2018 with the goal to implement the Plant Health Strategy for Canada through improving coordination of plant health surveillance and enhancing the response to pest threats across Canada. Different working groups were formed under the Council focusing on three key pillars: biosecurity, emergency response and surveillance (Figure 1).



Weeds Surveillance Community of Practice (WSCP)

The WSCP forum allows sharing of information regarding weed management issues and needs, while providing opportunities to develop collaborative projects to address these.

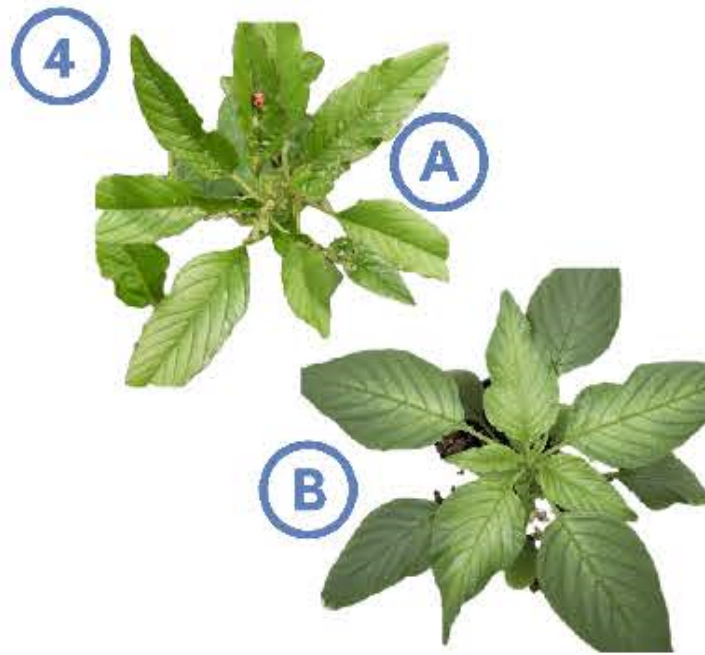
Membership is open to everyone.

Currently, the WSCP has 27 members from 14 institutions across Canada (Figure 3). To become a member, please contact :

cphcsecretariat@gmail.com.



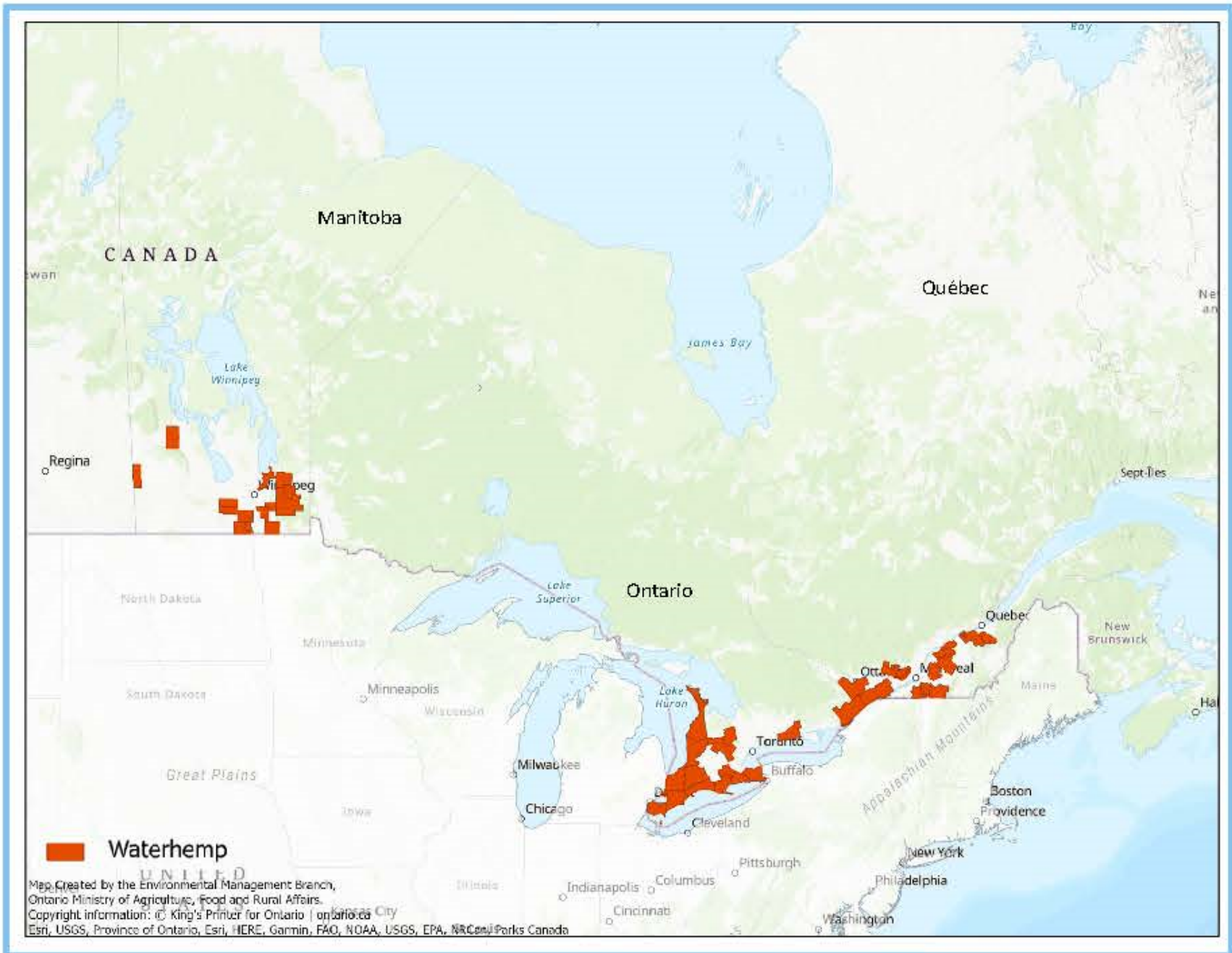
Amaranthus species



The WSCP focuses on *Amaranthus* species, primarily common waterhemp (*Amaranthus tuberculatus*, Figure 4A) and Palmer's amaranth (*A. palmeri*, Figure 4B), as they pose a significant threat to Canadian agricultural production. Both species are very competitive and resistant to multiple herbicide groups, making their control quite challenging.

At this time, only common waterhemp has been found in Manitoba, Ontario and Quebec (Map 1).

Early detection is key to the implementation of successful management strategies. This undertaking will also help with the identification and early detection of Palmer's amaranth.



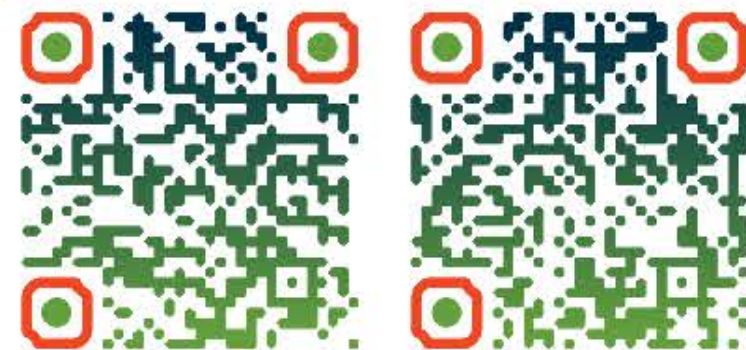
Map 1. Counties and municipalities in Canada with confirmed presence of common waterhemp (*A. tuberculatus*) between 2014 and 2022. (Modified from : OMAFRA, LEDP-MAPAQ and Manitoba Agriculture, 2022).

WSCP's ACTIVITIES

Outcomes achieved by the WSCP To-Date

- Publication of harmonized protocols (bilingual, EN & FR, Figure 5) to guide monitoring for *Amaranthus* species. It features rapid genetic tests available to detect herbicide resistance (Table 1), biosecurity protocols and other relevant resources, as well as contact information for reporting suspected cases
- Questionnaire to gather information on the distribution of waterhemp and associated farming practices to inform the development of effective management programs (Figure 6) .
- Common repository for literature regarding *Amaranthus* species.

5 Harmonized protocols



6 Questionnaires

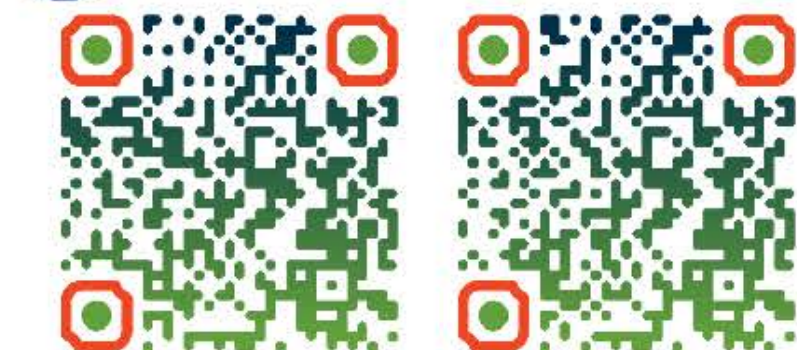


Table 1. Genetic herbicide resistance tests available for common waterhemp in Canada.

Resistance to Herbicide Group	Resistance target site mutation*
2	S653N, W574L, A122T, A205V, D376E, S653T
5	A251V, S264G, V219I, F274L
9	P106S & EPSPS gene amplification
14	ΔG210 in PPX2L, R128I**

*All tests are developed by Dr. Martin Laforest lab et. al at AAFC's Saint-Jean-sur-Richelieu Research and Development Centre, QC, unless specified (see **).

** Test developed by the Laboratoire d'expertise et de diagnostic en phytoprotection, Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (LEDP-MAPAQ).

ACKNOWLEDGMENTS

We would like to thank all the members of the WSCP, the Secretariat of the CPHC, as well as everyone that collaborates with the group, including : S. Mathieu, B. Duval, A. Lebrun, P. Sikkema, F. Tardif, M. Cowbrough, L. Benoit, B. Hedges, N. Langdon, M. Schryver, C. Willemsse, H. Symington, C. Grainger, T. Jones, K. Brown-Livingston, M. Laforest, D. Miville and M.J. Simard.

Photos and icon credits: S. Flores-Mejia (4A and sidebar), LEDP-MAPAQ (Figure 4B, via IRIIS Phytoprotection), Freepik (via Flaticon.com) and venngage.com.



Canadian Food Inspection Agency

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