

MANAGE RESISTANCE*Now*

Welcome to the Manage Resistance Now newsletter!



This newsletter is designed to keep you updated on the latest information regarding resistance management. We appreciate your support in sharing information to raise awareness of pest resistance and promoting the valuable resources available on ManageResistanceNow.ca. We also welcome your suggestions for additional resources that would be helpful for you, your stakeholders, and, of course, Canadian growers.

What to watch and what to share this season

Supporting your network this growing season

As the planting season gets underway, ManageResistanceNow.ca offers a range of practical, science-based resources to support resistance management on-farm. The site is designed not only for growers, but also for agronomists, retailers, and industry partners, making it easy to access and share valuable information across your network.

From case studies to information from Canadian growers, and fact sheets outlining best management practices, these tools help reinforce consistent messaging about pest resistance – weeds, diseases and insects – and support better decision-making throughout the season.

New factsheet focuses on understanding herbicide resistance

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Protect your land, one field at a time



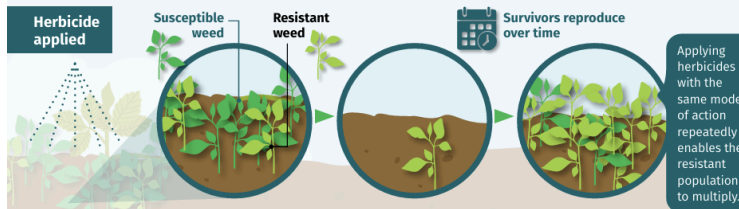
A QUICK GUIDE TO UNDERSTANDING HERBICIDE RESISTANCE

Herbicide resistance doesn't start when you spray, it already exists in the field. A small number of weeds naturally survive due to genetic differences. When a herbicide is applied, it acts like a filter: susceptible weeds die, while naturally resistant ones survive and produce seed.

Over time, repeated use of the same herbicide group allows these resistant weeds to dominate the population.

What this means:

If resistant weeds are already in your field, every herbicide decision influences how quickly they take over, not whether they appear.



A new fact sheet, [A Quick Guide to Understanding Herbicide Resistance](#), is now available. The resource explains how herbicide resistance develops and evolves, different types of resistance, and emphasizes the impact of resistance for Canadian Farmers.

Weed to watch for: Palmer amaranth

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PALMER AMARANTH (AMARANTHUS PALMERI)

WHY IT'S IMPORTANT

Palmer amaranth is rapidly spreading throughout North America and threatening crop production. What makes Palmer amaranth such a challenge is its prolific seed production (100,000 – 500,000 seeds/plant) and because the small seeds are easily dispersed through the field.

It is one of the most widespread and economically damaging agronomic weeds in the Southeastern U.S. and has been shown to reduce soybean and corn yields by 79% and 97%, respectively. Not only is Palmer amaranth more competitive than other amaranth (pigweed) species, but it is also resistant to multiple herbicide modes of action (Groups 2, 3, 4, 5, 9, 10, 14, 15 and 27).

Palmer amaranth is one of the most aggressive and economically damaging pigweed species in North America, and while it's not currently established in Canada, it has been detected and eradicated in some areas, making early identification and prevention critical.

Looking for more information or resources about Palmer amaranth?

- Review and share this [factsheet](#) available at ManageResistanceNow.ca. The factsheet highlights key identification features and outlines the pathways that it can spread, including contaminated seed, equipment, and feed.
- Read the [Harmonized surveillance protocol for common waterhemp \(Amaranthus tuberculatus\) and other Amaranthus species](#). The harmonized surveillance protocol includes guidelines for field scouting, identification tools, and resources for herbicide resistance testing by province.
- Download or share the Palmer amaranth identification postcard in [FR](#) and [EN](#).

These Palmer amaranth resources are valuable for sharing with your network to raise awareness and reinforce the importance of vigilance, early detection, and preventing introduction to protect Canadian cropping systems from this high-risk weed.

What's new: Manage Resistance Now Frequently Asked Questions section

The [Grower FAQ section](#) is the latest addition to ManageResistanceNow.ca. This new resource brings together clear, straightforward answers to common questions about resistance in weeds, diseases, and insects, making it easier to communicate key concepts quickly and consistently.

This section is especially useful for:

- Addressing common misconceptions
- Supporting conversations with growers in-season
- Providing quick, shareable explanations backed by credible sources

It's a practical addition for anyone looking to simplify complex resistance topics into accessible industry insights.

Featured resources for the upcoming growing season:

Kochia factsheet

MANAGING HERBICIDE-RESISTANT KOCHIA

KOCHIA: A GROWING CONCERN

Kochia (*Bassia scoparia*) is an annual broadleaf noxious weed that is an increasing concern for crop producers throughout Canada.

The troublesome weed can significantly impact crop yield. Research shows mean yield losses are greatest in grain corn, followed by sorghum, soybean, sugar beet, stage corn, sunflower, spring wheat, field peas, carola and oat. Near-complete crop failure (>90% yield loss) was observed in corn, sorghum, sugar beet and sunflower.

Proper management practices can help growers protect yield and preserve their crop protection options for the future.

WIDELY ADAPTABLE AND PROLIFIC SPREADER

Kochia is difficult to control due to its ability to spread quickly and to thrive in challenging conditions such as heat, drought and high-saline soils.

Preventing kochia from setting seed (in field and non-crop areas) is critical to reducing its spread

Crop	Yield Loss (%)
Grain Corn	62%
Sorghum	62%
Soybean	48%
Sugar Beet	48%
Sunflower	48%
Stage Corn	27%
Spring Wheat	20%
Field Peas	8%
Carola	8%
Oat	8%

YEAR 1, SUMMER
Each kochia plant produces 75,000 seeds on average, ranging up to 100,000 seeds per plant.

YEAR 1, FALL
If left uncontrolled, the stem of a mature plant will break at its base and roll like a tumbleweed across fields dispersing seeds as it goes. Avoiding this from happening is critical.

YEAR 2, SPRING
When a resistant plant sets seed, thousands of those seeds will germinate the following year and a resistant population can build quickly. A tell-tale sign of this is a "kochia trait".

Identifying kochia

Kochia is one of the first weeds to emerge in the spring. The leaves are hairy and elliptical shaped with a trademark pink underside. Without proper weed control, the compact seedling will mature into a branched bush, up to two metres in height. The colour of the stem, and sometimes the entire plant, changes from green to crimson.

ABOUT HERBICIDE-RESISTANT KOCHIA

Herbicide-resistant kochia is one of the largest weed threats to crop production in Western Canada. Group 2 resistance was first reported in 1986; today, nearly all kochia populations in Western Canada have evolved to resist Group 2 herbicides.

Kochia is one of the most aggressive and widespread resistant weeds across Western Canada, with populations commonly resistant to multiple herbicide groups. Dry and drought-like conditions over recent years have contributed to the spread of kochia, especially since it can thrive in heat, drought and saline soils.

[This resource](#) outlines why kochia is such a high-risk weed and emphasizes the need for proactive, integrated management. With kochia capable of spreading quickly and building resistant populations.

Waterhemp factsheet

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MANAGING HERBICIDE-RESISTANT WATERHEMP

WHY IT'S IMPORTANT

Waterhemp (*Amaranthus tuberculatus*) is a non-native annual weed rapidly spreading across Canada. Currently found in Ontario, Quebec, and Manitoba, waterhemp prefers moist or wet conditions with full or partial sun, similar to many economically important crops.

DETECTIONS IN CANADA

WHY WATERHEMP IS A PROBLEM

- **Resistant to herbicides** – Most waterhemp in Canada is resistant to at least one herbicide mode of action, with multiple resistance common.
- **Becomes resistant quickly** – Waterhemp can evolve resistance in three cycles of selection (by the same herbicide(s)) due to its extensive genetic diversity.
- **Has a large emergence window** – From spring to early autumn
- **Fast growth** – 2.5 – 4 cms per day
- **Produces millions of long-lasting seeds** – Can produce up to 4.8 million seeds per female (300,000 – 1 million under the crop canopy), rapidly increasing the soil seed bank. Seeds become viable as soon as seven days after pollination and can persist in the soil for about eight years.
- **Spreads easily** – Seeds are small (~1 mm), facilitating spread through the movement of plants, farm equipment, migratory animals and birds.

DEVELOPING HERBICIDE RESISTANCE

Waterhemp is dioecious (separate male and female plants), which contributes to high genetic diversity and rapid herbicide resistance development. As a member of the Amaranthus (pigweed) family, it resembles related species, including redroot pigweed, green pigweed and Palmer amaranth and may hybridize with other pigweeds. Hybrid pigweeds may inherit herbicide resistance from one or both parents and have mixed morphology making it even more difficult to identify species.

See the [Palmer amaranth fact sheet](#) for identification help.

Most waterhemp found in Canada is resistant to two or more herbicide modes of action – and up to five modes of action in Ontario and Quebec.

Waterhemp is becoming a serious issue in Eastern Canada and is at risk of spreading across Canada. Waterhemp is a resistance concern due to its biology and adaptability.

[This factsheet](#) is a resource to help growers recognize early infestations and understand the importance of proactive management.

Resource spotlight and recommended reading

- [Benefits of Mode of Action Labelling](#) – This resource from CropLife International explores the power of Mode of Action (MoA) labeling and resistance management strategies, like rotating and mixing products with different MoAs, to outsmart pests and ensure sustainable farming. Watch the short [video](#).
- [Two-pass herbicide management may improve yields](#) - Experts show where a single pre-emergent pass may not fully overcome the effects of weather and herbicide resistance.
- [Emerging issue ramps up complexity for resistant weed management in cereals](#) - Battling resistant weeds in cereals is nothing new for Canadian growers, but the problem continues to evolve and cause new issues.
- [How to whack waterhemp | Soybean School](#) - Early identification and management of waterhemp is critical as this weed spreads across Ontario.
- Watch for a Manage Resistance Now article in the upcoming May issue of the [Milk Producer magazine](#).

Supporting on-farm resistance prevention and management

Whether you're preparing recommendations, answering tough resistance questions, or attending an event, Manage Resistance Now can support you with resources for [weeds](#), [insects](#), and [diseases](#), including factsheets, postcards and promotional materials.

You can also contact the [Manage Resistance Now Team](#) to learn how they can help you spread the word about pest resistance and best management strategies.

Check out the [Manage Resistance Now postcard](#) – available for your next event.



What can you do to support Canadian growers?

- Follow and share Manage Resistance Now content on your channels.
- Request printed copies of factsheets and postcards for your next event.
- Looking for a speaker, or need an expert on pest resistance? Manage Resistance Now has a team that can support you and your growers. Just reach out.

- Share your feedback – are you looking for a new resource? Want to partner on a project? We'd love to hear from you.

Let's work together today to help Canadian growers protect our cropping tools and technologies for tomorrow.

Please feel free to share this newsletter with colleagues in your organization. If you have colleagues who would benefit from these updates, please email [Manage Resistance Now](#) to have them added to the distribution list.



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