Weed Resistance Risk Assessment

Best Management Practices
Eastern Canadian version of weedtool.com

1. What is your normal crop rotation you use in this field?

Include 2 or more crops in your rotation and ideally rotate to a different crop each year.

- Crop rotation allows for diversification with crops with different competitive abilities and life cycles that keeps weeds off balance and helps prevent weed species from becoming established, competitive, or dominant in a field. Rotations consisting of corn, soybeans, and cereals, including winter annual (winter wheat) or perennial crops (forages), would be considered highly diverse and sustainable.
- Crop rotation offers the ability to change cultural practices like planting dates, fertility programs and tillage which help reduce some weeds from becoming established or dominating a production system.
- Crop rotation encourages herbicide rotation because several different modes of action (MOA) are typically available for weed control in a variety of crop species.

2. How often do you grow a Roundup Ready crop (*e.g.* corn, soybean, canola, sugarbeet) in this field?

Including Roundup Ready crops in a diversified crop and weed management program is a viable and effective production system.

- A high frequency of glyphosate tolerant crops in the rotation can increase selection pressure for glyphosate resistant weeds.
- Ensure other crops are included in your rotation to maintain diversity in your production system.
- Monoculture production practices for any crop (glyphosate tolerant or non-glyphosate tolerant) create agronomic challenges for pest management.
- Where possible use tank mixes with other herbicide groups to reduce the selection pressure of glyphosate.

3. What is your tillage (or cultivation) program for this field?

Tillage can be very valuable in many situations and should be considered as an alternate weed control practice where appropriate.

- Tillage is another weed management practice that can break certain weed patterns and reduces the reliance on herbicides for weed control. The more weed control tools utilized (*e.g.* crop rotations, proper fertility, seeding rates, sanitation), the lower the selection pressure for resistant weeds.
- Periodic tillage is a reliable cultural practice that also benefits your system by removing a build-up of crop residue on the soil surface, incorporating soil active herbicides and can even out ruts or rough spots in the field. However, only use tillage when necessary.

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4. For the preplant burndown treatment, do you tank-mix glyphosate with another herbicide or a premix with the glyphosate?

The addition on a non-glyphosate herbicide reduces the sole use of glyphosate which can decrease the risk of developing weed resistance.

- Tank-mixing herbicides with multiple modes of action are an effective strategy to manage hard to control weeds and can help lower the risk of weed resistance development.
- Although glyphosate is considered a low risk mode of action with regards to the development of herbicide resistance, the inclusion of an alternate mode of action in a tank-mix would serve to lessen weed population shifts and the selection intensity for glyphosate resistant weeds.
- To be successful both the glyphosate and the tank-mix partner need to be effective on the target weeds in the field.

5. When growing Roundup Ready crops, do you use an early season residual herbicide for this field?

Consider residual herbicides for early season weed control and management of hard to control weeds.

- Adding a residual herbicide can be beneficial in ensuring early season weed control to minimize crop yield losses due to weed interference.
- Early season weed control with a residual herbicide gives you more flexibility in timing your postemergence in-crop glyphosate application.
- An early season residual treatment reduces the overall weed pressure giving your postemergence program applied later a much better chance of success so weed shifts don't become an issue.

6. When growing Roundup Ready crops, do you tank mix another herbicide with glyphosate for in-crop weed control in this field?

Use the full, labeled rate of Roundup or glyphosate herbicide based on the most difficult –to –control weed in the field.

- Taller weeds become harder to control. If you allow weeds to continue to grow, a herbicide application may not provide adequate control. Some weeds may survive to create potential resistance risks.
- Uncontrolled weeds can go to seed and provide a much larger weed seed bank for next season.
- Always follow label recommendations for timing of herbicide applications and appropriate rate of application.
- Tank mixing another herbicide with glyphosate adds MOA diversity which can decrease the selection pressure for glyphosate resistant weeds.

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7. How many times do you use a herbicide with a different mode of action (other than glyphosate) in your crop rotation in this field?

Adding herbicides with different modes of action reduces the risk of selecting for glyphosate resistant weeds.

- Adding mode of action diversity throughout the crop rotation reduces the risk of selecting for glyphosate resistant weeds.
- Tank mixes with glyphosate offer an effective strategy to reduce the risk of selecting for resistant weeds in Roundup Ready crops.
- Mode of action diversity can be accomplished through the use of preplant residual or post-emergent herbicides.

8. When you use Roundup or glyphosate herbicide (alone), the weed control in this field (not including crop volunteers) is?

Excellent weed control in your field until crop canopy can be an indicator of good weed control throughout the season.

- Weeds present at crop canopy are competing with your crop and could be reducing yield.
- Uncontrolled weeds can go to seed and provide a much larger weed seed bank for next season.
- Weeds can make harvesting difficult and seeds may be distributed to additional fields via the harvesting equipment.
- Weeds at harvest can affect grain quality, lead to higher dockage and result in grain storage problems.
- Weeds present at harvest that are not controlled can be a result of numerous factors such as environmental conditions, sprayer misses, incorrect application rates, later germination, but they could also suggest a resistance problem.

9. On this field in 12 months, you typically use glyphosate how many times?

Make glyphosate applications at the optimum time and rate required to achieve good weed control, but caution should be taken if glyphosate alone is used repeatedly over a 12-month period.

- The selection pressure for resistance development increases with the number of glyphosate applications in a 12-month period.
- Other mode of action products or tillage should be used to reduce reliance on glyphosate.
- Periodic tillage can substitute for glyphosate-based burn-down programs.
- Rotation to other crops, including Roundup Ready crops, where other chemistries are used, can break the cycle of multiple glyphosate applications.

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10. Over the past few years, how would you describe your weed problem in this field?

The goal is to reduce weed populations from year to year, allowing for more efficient use of herbicides and other cultural practices to control weeds.

- If weeds are allowed to survive and set seed, dramatically higher weed populations may result the next year.
- If you allow certain tough-to-control weeds to survive you may accelerate weed population shifts to species that are more difficult to control. Shifting weed problems may require a substantially different weed management approach.
- Weed species that escape glyphosate applications should be seen as a flag for obtaining more details as to why the weed was not controlled.