

# MANAGE RESISTANCE *Now*

Protect your land, one field at a time

## CASE STUDY

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## Diversity key to managing herbicide resistant weeds

Herbicide resistance is not new to Ontario farmers. The first reported case goes back to 1957 when 2,4-D resistant wild carrot was found. But, for field crop producers, it started in 1973 when triazine-resistant lamb's-quarters were found on a farm near Ripley, Ontario.

Group 2 resistant weeds were first documented in the province in 1996, but the roots of today's challenge to manage herbicide resistance were really set in 2008, explains Dr. Peter Sikkema, professor, field crop weed management, University of Guelph, Ridgetown Campus. That's when the first glyphosate-resistant giant ragweed was found in the province. Since then the glyphosate-resistant weed list has grown to include Canada fleabane (2010), common ragweed (2011) and waterhemp (2014).

### Multiple resistance gaining traction

Canada fleabane is currently the most widespread glyphosate-resistant weed in the province, explains Sikkema who focuses much of his research on developing and delivering weed management programs for Ontario farmers. Glyphosate-resistant Canada fleabane now stretches from southwestern Ontario's Essex county, adjacent to the Michigan border, all the way east to Glengarry county, adjacent to the Quebec border.

What makes the problem even more challenging for Ontario farmers, says Sikkema, is the presence of Canada fleabane that's resistant to both the Group 2 and Group 9 herbicides. Even higher levels of multiple resistance have been confirmed in waterhemp. "Just in 2018, we confirmed the first four-way resistant weed biotype in Canada. Waterhemp in some locations in Ontario is resistant to the Group 2, 5, 9 and 14 herbicides."

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### Herbicide-resistant weeds are manageable

When Sikkema talks with growers and agronomists, he emphasizes that herbicide resistance is manageable, but it will have a significant impact on a grower's bottom line.

"The presence of glyphosate-resistant weeds will have an impact on profitability," says Sikkema. Uncontrolled, these weeds will compete with the crop and will result in reduced crop yields. He uses the example of glyphosate-resistant Canada fleabane in soybeans to illustrate his point; dependent on the density of the fleabane and the relative time of weed and crop emergence, yield loss can approach 100 percent.

There is good news, however, for farmers in the fight against herbicide resistance. “We do have weed management programs where you can get near-perfect control of glyphosate-resistant Canada fleabane,” says Sikkema, but it requires additional cost. Sikkema’s most effective preplant burndown herbicide combination for controlling resistant fleabane costs \$30 per acre, much more than the \$6 per acre growers have become accustomed to paying for glyphosate. “That additional \$24 dollars is straight off of their bottom line on every acre that’s infested with glyphosate-resistant Canada fleabane,” adds Sikkema.



## Fighting back with diversity

But growers can fight back against herbicide resistance and reduce the impact on their bottom line. “I think the basis for managing glyphosate-resistant weeds in Ontario is diversity,” says Sikkema. “We need diversity in our crop production systems, such as a corn, soybean, wheat rotation.”

Diversity is also needed in herbicide programs. “We need to have diversity in the herbicide modes of action that we’re using. Anytime we apply a burndown herbicide, we should add a second effective mode of action to the tank.” Even with post-emergence herbicides, Sikkema says growers should not rely on glyphosate exclusively for weed control – add another herbicide to the tank that will address the predominant weeds on your farm.

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## Implementing an integrated weed management program

Growers should implement an integrated weed management program on their farms. “I think growers should consider growing three, or more, crops in rotation, select crops with different seeding and harvest time such as winter wheat, increase their seeding rate; reduce their row width so the crop is more competitive with the weeds. Each one of these components will contribute to your overall integrated weed management program,” notes Sikkema. “In some situations, it may make sense to use a cover crop, after winter wheat combining for example, to keep the soil covered so that you don’t get any emergence of late germinating weeds in that field.”

If farmers have been lucky enough to avoid herbicide resistance, Sikkema says a diverse, integrated crop management program can play a key role in reducing the selection intensity for herbicide-resistant weeds.

“I think by implementing a diverse, integrated crop management program on the farm, prior to the herbicide-resistant weed showing up on your farm, you’re going to reduce the probability of herbicide-resistant weeds showing up on your farm.”

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