Wild oat is one of the most widespread weeds in Western Canada, and can cause up to 20% yield loss if not managed properly. As such, it’s a serious concern for most growers, who spend more than $500 million on control methods collectively each year. Herbicide-resistant strains were first discovered in 1989, and though there are no confirmed cases yet, research shows wild oat is highly likely to develop glyphosate resistance.

**HERBIQUE-RESISTANT WILD OATS ARE ON THE RISE**

Because they have high populations, high genetic diversity and high seed production, wild oats are high-risk for developing herbicide resistance. Unfortunately, resistance rates are rapidly increasing: in Alberta, 11% of sample sites had herbicide-resistant wild oat in 2001. In 2007, that number rose to 39%, and in 2014, it was more than 50%. According to herbicide resistance expert Hugh Beckie, you’re considered to be in the minority on the Prairies if you currently don’t have any resistant wild oats.

Although this currently only applies to Group 1, 2, 5 and 25 herbicides, experts worry that it’s only a matter of time before glyphosate-resistant (GR) strains begin popping up. “Looking at how extensively glyphosate is used in pre-seeding burnoff, pre-harvest applications and in-crop with Roundup Ready® varieties, it can’t be long in happening,” says Nasir Shaikh, provincial weed specialist with Manitoba Agriculture, Food and Rural Development.

**PREVENT THE DEVELOPMENT OF GR BIOTYPES**

Herbicide-resistant wild oat is the most widespread resistance issue in Western Canada, but taking steps to take selection pressure off commonly-used herbicides can go a long way in reducing risk. One such option is taking advantage of a Group 8 granular herbicide, like Avadex® MicroActiv from Gowan Canada. Gowan data indicates that it is effective against Group 1 and Group 2 resistant wild oat populations, and when applied in the fall, it helps reduce the density of wild oat in the spring.

Though creating the perfect control strategy can seem overwhelming, growers have many options. Here are a few other ways you can reduce the risk of developing glyphosate-resistant wild oats.

1. **Time your pre-seed burnoff correctly**

   You want to complete a pre-seed burnoff as close to seeding as possible: this will ensure your crop is established before the second flush of wild oats emerges, increasing its ability to compete. Another strategy to consider is using two applications of glyphosate in the spring: an early one for perennials, and another just prior to seeding. The second pass should include an additional effective mode of action to reduce glyphosate selection pressure.

2. **Use multiple modes of action**

   Although we’re seeing more and more cases of herbicide-resistant weeds each year, odds are low that any individual weed will be resistant to multiple modes of action. So as you choose from an array of options for your in-crop applications and pre-seed/post-harvest burnoffs, there are a few things to keep in mind. First, know that the more modes of action or herbicide groups you use at once, the more effective you’ll be at reducing selection pressure. Second, consider a tank mix over alternating between single-mode applications: they’ve been found to be more effective, as one mode of action can provide broad-spectrum control while the other eradicates weeds that have developed a resistance to the first.

3. **Use high seeding rates**

   Wide rows and low crop plant densities provide more space for weeds to establish themselves and compete with crops for resources. To increase your crop’s chance of achieving its maximum yield potential, it must cover the ground as densely as possible before weeds emerge, so it can better compete with late-emerging weeds. Research conducted by Charles Mohler at Cornell University indicated that a simple 50% increase in seeding rate substantially reduced weed growth without negatively affecting crop quality.

   High seeding rates with no herbicide use at all have proven to be just as effective as a typical crop rotation and herbicide routine. In a recent study, Neil Harker found that 2x seeding rates coupled with a diverse crop rotation was just as effective at managing wild oat as was a repeated canola-wheat rotation under a full wild oat herbicide routine.
4. Ensure good crop establishment

Seeding rates aside, it’s important that growers do everything they can to close the canopy before new weeds surface. To get your crop to emerge quickly and evenly, be mindful of your fertilizer placement and seed quality. To make sure wild oats don’t benefit, ensure fertilizer is properly banded close to the seed. We recommend using certified seed, which is free of weed seed and comes with a quality guarantee.

5. Grow a diverse crop rotation

At the 2016 Herbicide Resistance Summit in Saskatoon, Neil Harker noted, “Weeds fortunate enough to grow in simple, repeated cropping systems of the same lifecycle will continue to have little difficulty adapting and thriving.” This can cause resistance rates to skyrocket: the higher number of weeds you have in a field, the more likely it is that at least one is able to survive a herbicide treatment. Often, growers who rotate between only a few profitable crops come to rely on a narrow selection of herbicides, which can compound the problem of selection pressure.

The more diverse crops your rotation includes, the better. In an experimental study, Harker found that growing a crop with a different lifecycle than wild oat (e.g. perennial alfalfa and winter wheat) without herbicide use was just as effective at managing wild oat as a repeated canola-wheat rotation under a full wild oat herbicide routine.12 Ideal rotations for wild oat should include winter and spring crops, broadleaf and grass crops and perennial forages.13 However, as long as you have three or more different crops in your rotation, you can break the weed growth cycle.

Because wild oat can cause up to 20% yield loss if not managed properly,14 it’s crucial to reduce selection pressure of glyphosate before resistant strains are found. Stay on top of the problem by scouting regularly for signs of herbicide resistance. When using herbicides, remember to tank mix multiple effective modes of action. Grow a diverse crop rotation and take advantage of the opportunity to use different herbicide groups, which helps prevent resistance from developing. Following these best practices will help glyphosate remain effective for years to come.

5 Source: Neil Harker, 2016 Weed Summit