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New Forage Barley Varieties Choke out Weeds

It's a potential new herbicide that doesn't come from a can or need to be sprayed. In fact, it's all natural - it's forage barley.

A team of Brandon, Manitoba researchers has discovered that barley is an effective "bioherbicide" that could drastically reduce chemical herbicide use in properly managed crop rotations.

"Basically we are taking advantage of the extraordinary growth and vigour shown by the newest types of forage barley," says Mario Therrien, a barley breeder at Agriculture and Agri-Food Canada's Brandon Research Centre. "Our investigation is showing that most annual broad-leaf weeds cannot compete with the latest fast-growing forage barley varieties."

Farmers are partially supporting this research through the Barley Check-off Fund, administered by Western Grains Research Foundation. The Barley Check-off Fund supports barley breeding programs in Western Canada, including the effort at Brandon Research Centre. The research is led by Dr. Doug Derkson, a weed management specialist at the Centre, and is also supported by Manitoba Rural Adaptation Council and Agri-Food Research and Development Initiative.

If the current results hold true over several more years of investigation, and researchers can optimize the management strategies, forage barley could help farmers save thousands of dollars annually on chemicals, says Therrien. "This could be an important approach in sustaining crop production in Western Canada."

"The only condition for using forage barley as a bioherbicide is that it must be harvested as forage, because of the timing required," he says. "This suits a lot of situations. Many producers have mixed operations or have neighbours with cattle that can use the forage."

Weeds mixed in with the barley won't greatly affect feed quality unless the field contains an unusual set of weeds, such as stinkweed or a few of the toxic weeds, he says. "In a weedy field, about 20 percent of the material can be weeds, but it's still good digestible material for the cattle."

The key to using forage barley as a bioherbicide is selecting the right barley variety and timing the harvest. "Basically, you plant a good forage barley, one that grows fast, thick and hard," says Therrien. "Then you harvest it at soft dough, when most of the broad-leaf weeds are at a vulnerable stage."

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Variety selection does seem to make a difference. AC Ranger, developed by Therrien, is one of several varieties that are proving to be solid weed killers. Other varieties show less potential, he says. "We have a PhD student investigating the underlying mechanisms behind what makes some varieties so good at choking out weeds."

Forage barley works best as a bioherbicide when the next crop in the rotation is not a cereal, he says. "For example, we have found that if you have weedy field, it's best to plant barley in the first year. In the second year, plant canola, and use proper control methods for the grass weeds. In the third year, a farmer should be able to grow herbicide-free wheat."

Further research is required to optimize the management of the rotation and the growth of the barley itself. "We want to look at the best practices for growing the forage barley as fast possible in a cost-effective manner, to ensure the best weed-killing action for the buck," says Therrien.

Once researchers nail down the traits that make some barley varieties potent weed eradicators, Therrien plans to select for those traits in his breeding program. "In the future, we could see a barley variety registered specifically as bioherbicide."

For farmers, this would mean a new herbicide option that's simple and safe. "All you have to do is grow it," says Therrien.

The Barley Check-off Fund contributes over \$600,000 annually to barley breeding programs in Western Canada. Breeding targets include improved agronomy, disease resistance and quality for both feed and malting varieties.

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