AGRI-FACTS
Practical Information for Alberta's Agriculture Industry

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Control Options for Downy Brome on Prairie Reclamation Sites

Downy brome, *Bromus tectorum L.*, is an annual grass that came from Europe in about 1861. It's now the dominant plant on over 100 million acres in the western United States, making it the most common plant on the continent. A major problem in the United States, downy brome is also becoming a problem in the southern parts of British Columbia, Alberta and Saskatchewan.

Some of the common names that this grass is known by include: downy brome, cheatgrass, military grass and downy chess. Downy brome thrives on medium to coarse textured soil types (sandy or gravelly soils) and in low to medium precipitation zones. It's currently listed as a nuisance weed in the *Alberta Weed Control Act*, but has been elevated to noxious weed status by several municipalities in Alberta.

Figure 1. Seed head of downy brome

Why is it a problem on native prairie?

- It can displace native grasses that are much more nutritious for cattle.
- The sharp awns can cause lump jaw in cattle.
- It reduces the diversity found on native rangeland. For example, on native prairie you can find up to 50 different native grasses and wildflowers per quarter section. This is much healthier for wildlife, cattle, soil and recreation than is replacement by one species.
- It's difficult to get rid of once it gets established.
- It can spread quite quickly. For example, in Nevada it spread from 0.5 per cent of the state's rangeland to 25 per cent in 35 years. Infestation is often followed by much worse weeds like yellow starthistle.

Why is downy brome spreading?

- Downy brome produces 500 lbs/acre or 550 kg/hectare of seed every year.
- It germinates under a variety of conditions: 5° to 40°C.
- Although 98 per cent of the seed germinates within two years, the remaining two per cent (10 lbs/acre) can germinate up to five years later.
- It persists along fencelines.
- It likes disturbed soil.
- Calves tend to like to lie in it, spreading the seed.
- It gets onto reclamation sites through the use of contaminated straw used for crimping, impure seed and equipment that hasn't been cleaned.

Alberta

What can we do to prevent the spread of downy brome?

- Ask for a seed testing certificate for every seed lot of seed purchased for reclamation (prior to mixing) and ensure that it contains no downy brome.
- If you are using straw for crimping, use reputable growers and inspect the fields for weeds prior to harvest. On public land you must also receive clearance from the local Public Lands manager.
- Keep disturbances as small as possible, particularly on sandy or gravelly soils.

Controlling established downy brome

Various mechanical and chemical methods can be used to control downy brome. Scientists are working on specific bacteria for biological control, but this is still at the testing stage. The most important factor to consider when initiating a control program is timing. This weed must be controlled early in the season, prior to seed set. In southern Alberta, this is no later than mid May.

The second most important factor is vigilance. Make sure that hard to reach areas are also targeted. When using large equipment, there's a tendency to miss small areas. This leaves enough plants alive to allow downy brome to invade again. Constantly scout areas to stop new infestations.

The third factor is persistence. A single treatment is unlikely to solve a downy brome problem. There's potential for seed in the soil to germinate for up to five years and sometimes plants will regrow from the roots. Plan for a minimum of three years control once a problem has been identified.

Options for mechanical control

Hand pulling

This is effective for small infestations, if it's done prior to seed set.

Mowing

Mowing can be used at the bloom stage for control, but short plants are often missed with the mower. This allows them to produce seed.

Burning

If used in the spring when plants are at the dough stage, propane burners are effective for removing both living plants and the litter that may contain seed. Burning in the spring also means the fire hazard is lower. Disadvantages include a low travel speed of 0.4 to 0.8 km per hour and high expenses, approximately $250 to $300 per acre for fuel and labor.

Steam treatment

This treatment can effectively kill living plants. It must be done prior to seed set to prevent another infestation. It probably won't kill the seeds in the soil.

Grazing

This can be used on a repeated basis if it's done early in the season. Grazing is most effective when its use is combined with another treatment option.

Options for chemical control

Note: The majority of the chemicals listed here are not officially registered for use on downy brome. The application rates are quoted from the Downy Brome Symposium (1996).

Disclaimer: Mention of trade names or commercial products does not constitute endorsement, or recommendation for use.

Non-selective herbicides

Non-selective herbicides eliminate all vegetation, even desirable species. On prairie, this can be a big problem because often the desirable native vegetation on reclamation sites is eliminated.

Roundup

This is effective on downy brome. It's most effective if applied when the plants are small. Roundup is transported within the plant, so the roots are also killed. This herbicide is usually applied at a rate of one-half to one litre per acre.

Gramoxone/Gramoxone PDQ (Paraquat)

This kills plants on contact so it's important to get good coverage. Gramaxone is not transported to the roots of the plant. This may be advantageous on prairie because it may not kill the roots of the perennial prairie plants, allowing the desirable plants to grow again. Gramoxone has a faster kill (2 to 3 days) than Roundup (10 to 14 days). It's usually applied at a rate of one litre/acre.

Liberty

This herbicide has a contact action like Gramoxone, but it's not registered for this use.

Selective herbicides

Selective herbicides eliminate specific types of plants, i.e., they can potentially kill downy brome and leave desirable plants. However, selective herbicides have varying effectiveness in controlling downy brome. Researchers have found that downy brome plants that have over-wintered are harder to kill than new seedlings that emerge in the fall.

Sencor (Metribuzin)

This is registered for use in winter wheat. It needs to be applied when downy brome is quite small. In this case the fall is the best time for application. An advantage of using this herbicide is that some tame forage grasses have varying degrees of tolerance to Sencor. The tolerance of native grasses to Sencor is unknown. It's usually applied at 300g/acre.

Velpar (not registered for downy brome)

This is used on alfalfa crops in Alberta. Some other legume crops may also be tolerant. Velpar is applied in the fall when alfalfa is dormant. This is very effective on a number of weeds including downy brome.

Poast (Sethoxydim) (not registered for downy brome)

This kills downy brome in broad-leaved crops. Broad-leaved crops and broad-leaved weeds are tolerant of Poast. A few grasses, like creeping red fescue, are somewhat tolerant. It's usually applied at 450 ml/acre.

Assure (not registered for downy brome)

Assure is similar in activity to Poast. Research trials indicate that Assure may be more effective than Poast on downy brome. Assure is usually applied at 400 ml/acre.

Treflan, Rival or Bonanza (trifluralin)(not registered for downy brome)

These herbicides are incorporated into the soil prior to seeding. Most broad-leaved crops are tolerant to these and some grasses have a bit of tolerance as well. These would work well when cover crops are sown. It's usually necessary to come back with some type of post-emergence treatment in year two or three.

Sundance (not registered for downy brome)

Sundance is a new product from Monsanto that looks like it may be effective for selective downy brome control in broad-leaved crops and in some forage grasses.

Treatment suggestions for infestations on prairie reclamation sites

Small infestations

Hand pulling for two to three years is the most effective treatment method.

Heavy infestation in a new seeding

Apply Roundup to the whole area for two to three years and reseed. Hand pull or spot spray the remaining plants with Roundup.

Well established native stands with too much downy brome to hand pull

Try one of the selective herbicides that forage grasses have some tolerance to. Another option is to use a contact herbicide that kills top growth, but doesn't affect the roots.

References

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