



Managing Smooth Brome in Native Grassland



Smooth Brome Grass

INVASIVE SPECIES

Introduction

Bromus inermis, commonly referred to as smooth brome grass, was introduced to Canada from Eastern Europe. In the last hundred years smooth brome grass has been extensively seeded in pastures, hayfields, and along roadside ditches throughout the United States and Canada. Unfortunately, the very characteristics that make it so effective in producing abundant forage and stabilizing the soil also enables it to invade native grasslands.

Smooth brome is a cool season grass that has become a problem in disturbed portions of pastures in the aspen parkland, fescue, and the mixed grass prairie regions. Parcels of native grassland most at risk are those that are idled or located in moist areas. In the mixed grass prairie regions, smooth brome grass invasion is most common in moister areas such as draws,

creeks, and wetlands, and is very rarely a problem in upland sites. This vigorous grass is most competitive when it is not grazed, mowed or burned.

The Problem

Native prairie is a part of our natural history and is important as a grazing resource, wildlife habitat, and for soil and water conservation. With few natural controls in the Canadian Prairies many introduced or exotic species have the ability to invade natural habitats and out-compete the native species. Threats such as the invasion of exotic species can degrade our prairie by excluding native species which reduces biodiversity, carrying capacity, habitat and the aesthetics of our prairie ecosystem.

Smooth brome grass has several characteristics which help it out-compete native grass species:

- It begins growth earlier in the spring allowing it to access soil nutrients and available water.
- It is relatively tall and because it starts growth early in the spring it often shades native plants.
- It produces deep roots and a dense mat of rhizomes (underground stems), which compete effectively throughout the season for water and nutrients making it drought resistant.
- It spreads mainly by rhizomes and somewhat by seeds. One plant can produce 150 to 10,000 viable seeds in one growing season.
- The seeds can germinate under a wide variety of soil, moisture and light conditions and can stay viable in the soil for five years.



FACT sheet

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Know Your Problem

Management goals for small to moderate sized stands (two to five meters (8 to 15 feet)) interspersed with native vegetation should focus on the reduction of smooth brome grass growth while increasing the production of native species. The increase in native species will further stress smooth brome grass by adding competitive pressure. Control methods that stress smooth brome grass with minimum damage to native species should be selected (herbicide wicking).

For large brome grass stands (encroachment along a fence line or areas between tame and native fields) that exclude native species management should focus on defoliation of smooth

brome grass (dormant season burn) prior to treatment (grazing or herbicide application). Defoliation will stimulate smooth brome grass growth and will focus grazing on smooth brome grass plants increasing the effectiveness of herbicide application.

In Fescue Prairie ecosystems most grass species start growth in early spring close to the same time as smooth brome grass. Management techniques that affect smooth brome grass will also affect native grasses. Management goals should focus on stressing smooth brome grass in mid summer to reduce negative impacts on native species.

Controlling Smooth Brome Grass

Controlling smooth brome grass invasion is a challenge because many of our native plants grow at the same time as smooth brome grass. This indicates that smooth brome grass and many native species are vulnerable at the same time. Successful methods impact smooth brome grass specifically or at least more negatively than native species. Controlling smooth brome grass implies stopping its advance into native prairie and possibly pushing it back over time, by giving native plants the competitive edge.

In most cases, the presence of smooth brome grass is too great, and to try to eradicate it would prove to be not only extremely difficult but impossible in many situations. The solution therefore is to accept its presence and concentrate efforts on its use. Treat large

patches of smooth brome grass as one big field and manage for production. The goals should be centered on containing existing populations and preventing its further establishment. For small patches, eradication and control may be more of an option. Small patches in native prairie should be controlled with various patch treatment options such as mowing, grazing or herbicide wicking.

1. Prevention

Prevention of smooth brome grass establishment and invasion reduces the need for years of control. Use management practices such as mowing or grazing to prevent seed production. This will not only decrease smooth brome grass seed in the soil but also prevent the spread of its seeds. Also, by keeping your native prairie in a healthy state, you will decrease the chance of invasion by smooth brome grass. And if seeding land adjacent to native grassland, choose not to use smooth brome grass as part of the seed mix.

2. Consistency

No one treatment will control smooth brome grass. A combination of two or more treatments is required in order to be successful. In addition, treatments need to be repeated over several years.

3. Monitor

Monitoring management regimes will be helpful in determining if management goals and objectives are being met. Document your management regime and its impact over time. This will

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show progress and the long-term trends. The use of permanent markers (to be used on the boundary of smooth brome grass patches) may prove to be helpful in determining whether the smooth brome grass is staying in place, being pushed back, or further encroaching. Documenting your management action may also be useful such as the timing, location, and intensity of treatments as well as weather conditions and changes in the plant community.

Management Techniques

No single treatment will control smooth brome. Management is a process of repeated applications, keen observation and modification of management techniques. Timing is best based on plant development as opposed to calendar time. Plant growth is influenced by precipitation, temperature, slope, soil and latitude and thus varies from year to year.

Grazing

Grazing, if done at the right conditions, prevents seed set and weakens smooth brome grass. However, smooth brome must be grazed before the apical meristem (growing points of a plant where new cells are formed such as the tips of the roots or stems) elongates or it could produce an abundance of regrowth after it has been defoliated. During the growing season, cattle and sheep prefer its larger softer leaves when compared to the finer leaves of most native grasses.

In small patches where the goal is to eliminate smooth brome grass as much as possible, the patch should be grazed early (when the stem begins to elongate, usually in early May), allowed to rest for a short time (usually less than 20 days) and then grazed again. It is important that the smooth brome grass is not fall grazed. Smooth brome grass takes on a stemmy appearance in the fall making it unpalatable to cattle. Once this occurs, livestock will select native species over smooth brome grass.

In large patches, the smooth brome should be managed for production. Patches should be kept vegetative and lush, therefore palatable to livestock. This will increase selectivity, decreasing the stress on native plants. Large patches should not be grazed until smooth brome grass is near flowering or seed production (usually mid May) and should only be grazed once a year. This will allow for optimal levels of production of smooth brome grass.

Mowing

In both experimental studies and management experience, a single cutting of smooth brome grass while in the boot stage (flowering heads still enclosed within the sheath) is the most effective method for preventing seed set. It is especially practical for preventing seed production in small areas or patches of smooth brome grass. The best conditions for damaging smooth brome grass are hot, moist weather at the time of cutting followed by a dry period.

Cutting annually for five years or more may also decrease smooth brome grass in the seed bank. Additional summer cuttings will further stress smooth brome grass by keeping carbohydrate levels slightly lower. The more frequent the cutting, the greater the impact.

Prescribed Burning

Prescribed burns can be effective in keeping smooth brome grass from spreading but burning alone will not significantly reduce populations. The best time to burn is when smooth brome grass is in the boot stage (usually late May). This will result in less seed being produced as compared with dormant season burning.

It is also important to note that in order for prescribed burning to be effective, subsequent burns have to take place (ensure that sufficient litter has accumulated so the fire has enough fuel to burn). In fact, burning only once may encourage the growth and dominance of smooth brome grass. The effects on native

species have to be considered for growing season burns. Smooth brome grass begins growth in early spring and there may be only a small period of time before native species begin growth (one to two weeks).


Chemical Control

Herbicides may be selectively applied to smooth brome grass by wiping because of the increased height of smooth brome grass as compared to most native species. In the process of wiping, herbicide is applied only where the applicator contacts the plant. Although only a small part of the plant receives herbicide, the concentrated solution (33 percent glyphosate) will kill the entire plant stem.

Herbicides should be wiped when the height difference between smooth brome grass and native grasses is greatest. This is generally when smooth brome grass stems have elongated or are in early boot stage. When smooth brome grass stems are elongating, there is also greater movement of the herbicide to the roots.

Application using a hand held wiper (e.g. Red Weeder), which looks like a hollow hockey stick, is ideal for small patches. Larger areas may be treated using a wiper mounted on an all terrain vehicle or tractor. The wiper is set at a specific height so that only plant material above that height, in this case smooth brome grass, is contacted and the shorter native plants are not touched. Machine application may not be appropriate for rough land.

This method of application



will not eliminate smooth brome grass entirely because not all smooth brome grass stems will be tall enough to be contacted. Smooth brome grass will increase over time if other actions, such as a follow-up herbicide application are not taken. This method should however, give a competitive edge to the native species in the short term and reduce the rate of spread of smooth brome grass.

Using Combinations of Management Techniques

Burning and Grazing

A burn when smooth brome grass is in the boot stage followed by cattle grazing of the re-growth may dramatically reduce smooth brome grass and provide excellent weight gains for livestock. Do not use this approach where shrubs are a problem: cattle will graze relatively little of the shrub growth when lush grass growth is available. As a consequence, grass competition is severely reduced and shrub growth may increase.

Dormant season burns combined with grazing may also be effective in controlling smooth brome grass expansion. Smooth brome grass growth will be increased and grazing will be focused on smooth brome grass.

Burning/Grazing/Mowing and Chemical Control

The use of grazing, mowing, or burning prior to herbicide wicking may increase herbicide effectiveness.

Grazing or mowing in the growing season may stimulate growth so that more stems are present to receive herbicide. For example, in the spring a smooth brome grass patch may be mowed to stimulate tillering (tiller production), in the summer the same patch may be grazed, and then in the fall any emerging tillers (an erect shoot located at the base of a plant) on that patch can then be spot sprayed.

The use of burning prior to herbicide wicking may increase herbicide effectiveness. An early spring burn removes litter and stimulates growth, thereby increasing the height difference and the area to which herbicide may be applied. Spring burning followed by application of a herbicide such as Glyphosate will provide excellent control but may damage native species if not applied properly. Fall burning can be done but is less effective as native species will not recover as quickly and the

loss of vegetation will reduce snow trapping in the winter resulting in drier soil condition and reduced vegetative growth in the spring.

Monitoring

An increase in plant diversity can be observed after a few treatments. Monitoring management regimes will be helpful in determining if management goals and objectives are being met. It is helpful to record your management actions (timing, location, intensity, plant stage) as well as weather conditions and changes in the plant community.

One way to see whether you are keeping smooth brome grass in place or pushing it back is to install permanent markers on the boundary of the smooth brome grass patch. Landscape and ground cover photos may also be useful.

Summary

Smooth brome grass is an extremely competitive species that has invaded and threatens the biodiversity of many native habitats. Management of smooth brome grass should consist of an integrated approach using combinations of treatments to maximize damage to smooth brome grass while minimizing damage to native species and encouraging native species whenever possible. Management programs must be site specific, persistent and consistently monitored and adapted to control smooth brome grass and stop its spread over time.

For Further Information

A bibliography of the resources used to prepare this factsheet is available from the Saskatchewan Watershed Authority. Factsheets on other species and topics are also available.

Room 101-2022 Cornwall Street
Regina, SK S4P 2K5
Ph (306) 787-0726



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Agricultural Environmental Stewardship Initiative is a
Canadian Adaptation and Rural Development in Saskatchewan
Program funded by Agriculture and Agri-Food Canada.

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