

# **Seeding of Rangelands Burned by Wildfires**

## **Boundary Region, BC**

### **Overview**

#### **Broad scale seeding of all burned areas is unnecessary and inappropriate within the context of managing for a natural landscape.**

Many areas in the Boundary contain fire maintained ecosystems which are well adapted to fire and have plant communities that are highly resilient to low and moderate severity burns. A balance of values will be achieved if seeding is used to gain specific benefits while allowing most areas to regrow to a natural condition.

Following a burn some areas may benefit from seeding to address weed control, erosion control, or can be seeded for forage replacement and to take advantage of an opportunity to improve livestock distribution and provide forage enhancement. Thoughtful use of seeding will reduce the on-site and off-site effects of fireguards and staging areas. Seeding can also take advantage of the seedbed created by the fire to improve livestock distribution and forage production for livestock and wildlife.

Any seeding of Crown range must be done with the written permission of the District Manager and must be identified and planned in conjunction with the Range Program.

#### ***Seed Analysis Certificates and Weed Content***

Before purchasing and applying a seed mixture it is important to obtain a copy of and review the seed lot's Seed Analysis Certificate (Figure 1) to learn of any invasive plant species that are present in, or adjacent to, the seed lot. Under the Canada Seeds Act, all seed that is offered for sale must be graded and labelled before it can be sold and seed suppliers are required to provide a copy of the seed analysis certificate when requested by a customer. A seed analysis certificate documents three primary pieces of information:

1. Noxious Weeds Seed – This list will show presence of any federally listed noxious weeds. This will not include provincially or regionally listed noxious weeds.
2. Other Weed Seeds – This list will show presence of any other weeds seeds including provincially and regionally listed species.
3. Other Crop Seeds – This list will show presence of other seeds not supposed to be in the mix but that are not considered noxious or weeds (e.g. agronomic grasses).

When ordering seed, it is important to specify that the individual species in each mix must grade **Common No. 1** or better, and that the blended mixture must meet the grade requirements for **Common No. 1 Forage Mixture**. Accepting seed mixtures with a lower grade specification, such as Common No. 2 forage mixture or Canada No. 1 ground cover, may increase the likelihood of contamination by noxious weeds. It is important to note that under the Canada Seed Act there is no minimum standard for native seed and no grade designation for mixtures composed of native species. Exercise caution when interpreting seed certificates for native species.

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With respect to weed seed content, buyers can specify weed species they do not want in their seed mixes. This is useful when tendering for seed supplies.

To obtain a list of provincially and regionally listed noxious weeds go to:

[www.agf.gov.bc.ca/cropprot/weedguid/weedguid.htm](http://www.agf.gov.bc.ca/cropprot/weedguid/weedguid.htm)

Seed sealing number (lot number)
Crop certificate number
Crop Kind and Variety
Seed testing certificate number

**BrettYoung** Report of Seed Analysis

This certifies that a sample of Creeping Red Fescue Boreal designated as 1357-9-060037 CC # 09-8055624-401 Cert. No. 10-3772

was received from:  
BrettYoung  
Box 100  
Rycroft, AB  
T0H 3A0

and was tested at:  
BrettYoung  
Box 100  
Rycroft, Alberta T0H 3A0  
Tel: 780-765-3069 Fax: 780-765-3960

with the following results:

NOXIOUS WEED SEEDS	OTHER WEED SEEDS	OTHER CROPS SEEDS
Prohibited Noxious 0.0	None Found 0.0	None Found
Primary Noxious 0.0		
Total Primary 0.0		
Secondary Noxious 0.0		
Total Primary plus Secondary 0.0	Total Weed Seeds of all Kinds 0.0	Total Other Crop Seeds Less than 1%
Pure Seed 98.9%	Pure Living Seed 96%	Sweet Clover 0 per 25 grams
Other Crop Seeds 0.0%	Multiple Seed Units	Brassica Spp. 0 per 25 grams
Weed Seeds 0.0%	Included in Pure Seed 0%	Sclerotia
Inert Matter 1.1%	TZ 93%	Ergot Less than 1%
		Germination 97.5%
		Hard Seeds
		Germination
		Incl. Hard Seeds

Remarks:

This certifies that the sample of seed submitted from the lot designated above has been analyzed according to:  
Methods & Procedures of Seed Testing, C.F.I.A.  
C.F.I.A. Accredited Laboratory 1117

Date 18-Mar-11 Accredited Analyst Charolotte Kozuback

The responsibility for any seed sold under this Certificate with respect to Grade or any other specification rests entirely with the seller.

**Includes federally noxious species only, not provincial noxious.**

Germination - percent of seeds that grow  
Hard Seeds (only relevant to legume seeds) - seeds still included in germination  
Pure Living Seed - seed that is pure and viable

Pure Seed = crop seed only  
Inert Matter = stems, seed husks, dirt, etc.

TZ = Tetrazolium test (only applicable to cereals) - determines percent viable seed

Signed and stamped by accredited seed analyst.  
Place and Date of analysis.

Figure 1. Example Seed Analysis Certificate. Actual layout may vary.

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### ***Use of non-native seed***

There is concern about the introduction of non-native plant species through seeding of domestic forage species. Consider site sensitivity, invasiveness of the seeded species, and persistence of the seeded species and availability of native species when making your decisions. Short-lived, non-invasive domestic species will have the least long-term impact on a site while persistent invasive species will have the greatest.

There does not appear to be any native species available that can achieve a weed resistant cover in the short-term needed to control the establishment of invasive weeds. Furthermore, British Columbia cultivars of native grass species can be difficult or costly to obtain.

Annual grasses are an option as long as they can maintain sufficient cover in successive years to resist weeds. In very dry conditions, annual grasses may not set seed and therefore may not maintain the needed cover. Reseeding would then be needed.

Hard Fescue is persistent but not invasive on very dry sites and appears to be one of the only options available.

On moister sites, that will succeed to forests, very few of the domestic forages will be persistent. However, known invasive species such as smooth brome should be avoided.

### ***When to seed***

Plants need sufficient growth prior to freeze-up in order to survive the winter. The best times to seed are (in order of preference):

1. Immediately after the fire until the end of August.
2. If unable to seed prior to the end of August, seeding in October/November just prior to snowfall (<2.5cm or 1" of snow on the ground) or waiting until snowmelt in early spring may be the best option.
3. September seeding may be successful under ideal conditions (if the grass does not germinate until the following spring) but legumes will likely not survive. Seeding onto snow (>5cm or >2") has the same results.

Most sites will have the bladed material pulled back onto fireguards. Seeding can be done before or after this work.

If an area is scheduled for salvage logging then seeding should be done after the logging (to cover new disturbances), and can be done either before or after site preparation.

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### **Objectives for Seeding**

#### ***Weed control***

The following sites may benefit from seeding to achieve a weed resistant plant cover within one growing season. The purpose is to ensure that these areas do not become vectors for weed spread.

- Fireguards, staging areas and other mineral soils exposed by fire suppression activities
- Moderate and high severity burned areas (see appendix 1) where the area is at risk to weed invasion (e.g. on or near a transportation corridor, in close proximity to existing invasive plant sites).

For information on invasive plant locations go to the Map Display module of the Invasive Alien Plant Program at [www.for.gov.bc.ca/hra/Plants/application.htm](http://www.for.gov.bc.ca/hra/Plants/application.htm)

For local support on identifying invasive plants, your risk and treatment or management options contact the Boundary Invasive Species Society at [boundaryinvasives@gmail.com](mailto:boundaryinvasives@gmail.com)

#### ***Erosion control***

The following sites may benefit from seeding to achieve an erosion resistant plant cover within one growing season. The purpose is to minimize erosion during rain events and snow melt:

- Fireguards, staging areas and other mineral soils exposed by fire suppression activities that are on steep slopes, in gullies or draws.
- Moderate and high severity burned areas (see appendix 1) where native understory vegetation is killed and the areas is considered at risk to erosion (e.g. steep slopes, gullies and draws)

#### ***Livestock distribution***

Forage seeding can be used as an attractant to lure livestock from sensitive sites such as riparian zones. Ridge tops and areas far from water that have burned hot and have exposed soils are candidates for this treatment, and site selection would be at the discretion of local range staff.

#### ***Forage replacement***

If large areas burned hot enough to kill understory vegetation, then forage replacement by seeding may be needed. Care must be taken to not attract livestock into sensitive sites with this forage.

Areas that burned hot enough to create a seedbed, but not kill the understory vegetation, may produce slightly less forage during the spring following the fire because of the reduction in live tillers and the loss of moisture holding mulch. In many cases this reduced production will be

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compensated by an increase in areas accessible to grazing, and an increase in production due to the removal of forest canopy. Where this compensation is not anticipated, then forage seeding may be required to fill the time-gap until stressed plants fully recover.

Use low seeding rates and non-persistent species to minimize effects on the succession of these sites to a native plant community.

### ***Forage Enhancement***

In some cases, large areas have burned sufficiently to create a seedbed but not kill native understory. This may create an opportunity to enhance forage quality and quantity by introducing palatable and productive domestic forage. Care should be taken to select species that are not persistent or invasive. This treatment can create livestock management and utilization problems where remaining native plants have a lower tolerance to heavy grazing pressure.

### **Seed mixes and application rates**

The following mixes provide a range of options for dry and moist sites to address erosion, weed control and livestock use. These mixes deliver approximately the same number of seeds per species and include recommended application rates.

#### ***Grasslands, rangelands, Ponderosa Pine and dry Douglas fir forests***

1. Sensitive areas where we need to discourage livestock use

- Seeding rate 10kg/ha

Species	% by weight	Invasiveness	Persistence	Weed resistance
*Annual ryegrass,	35	Low	Low (1 yr)	High
Slender wheatgrass	40	Moderate	Moderate	Moderate
Chewings fescue	15	Low	High (+30 yr)	High
Hard fescue	10	Low	High	High

\*If you are fall planting use fall Rye, if you are spring planting use spring varieties

2. Areas where livestock use is appropriate

- Seeding rate 10kg/ha

Species	% by weight	Invasiveness	Persistence	Weed resistance
*Annual ryegrass	25	Low	Low (1 yr)	High
Slender wheatgrass	20	Moderate	Moderate	Moderate
Orchardgrass	20	Low	Moderate	Moderate
Hard fescue	10	Low	High	High
White Clover	25	Moderate	Moderate	Moderate

\*If you are fall planting use fall Rye, if you are spring planting use spring varieties

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### 3. Enhancing livestock distribution, and forage production

- Seed at 4kg/ha

Species	% by weight	Invasiveness	Persistence	Weed resistance
* Annual ryegrass	30	Low	Low (1 yr)	High
Slender wheatgrass	25	Moderate	Moderate	Moderate
Orchardgrass	25	Low	Moderate	Moderate
White Clover	20	Moderate	Moderate	Moderate

\*If you are fall planting use fall Rye, if you are spring planting use spring varieties

### ***Wetter parts of Douglas fir forests and lodge pole pine and spruce forests***

### 1. Sensitive areas where we need to discourage livestock use

- Seed at 10kg/ha

Species	% by weight	Invasiveness	Persistence	Weed resistance
Annual ryegrass	50	Low	Low (1 yr)	High
Chewings fescue	25	Low	High	High
Hard fescue	25	Low	High	High

### 2. Areas where livestock use is appropriate

- Seed at 10kg/ha

Species	% by weight	Invasiveness	Persistence	Weed resistance
Annual ryegrass,	55	Low	Low (1 yr)	High
Orchardgrass	30	Low	Moderate	Moderate
White clover	15	Moderate	Moderate	Moderate

### 3. Enhancing livestock distribution, and forage production

- Seed at 4kg/ha

Species	% by weight	Invasiveness	Persistence	Weed resistance
Orchardgrass	70	Low	Moderate	Moderate
White clover	30	Moderate	Moderate	Moderate

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Appendix 1. Burn severity coding matrix (USDI National Parks Service 2003)

Table 28. Burn severity coding matrix.

	Forests			Shrublands			Grasslands		
	Substrate (S)	Vegetation (V)	Substrate (S)	Vegetation (V)	Substrate (S)	Vegetation (V)	Substrate (S)	Vegetation (V)	
<b>Unburned (5)</b>	not burned	not burned	not burned	not burned	not burned	not burned	not burned	not burned	
<b>Scorched (4)</b>	litter partially blackened; duff nearly unchanged; wood/leaf structures unchanged	foliage scorched and attached to supporting twigs	litter partially blackened; duff nearly unchanged; wood/leaf structures unchanged	foliage scorched and attached to supporting twigs	litter partially blackened; duff nearly unchanged; leaf structures unchanged	foliage scorched and attached to supporting twigs	litter partially blackened; duff nearly unchanged; leaf structures unchanged	foliage scorched	
<b>Lightly Burned (3)</b>	litter charred to partially consumed; upper duff layer may be charred but the duff layer is not altered over the entire depth; surface appears black; woody debris is partially burned; logs are scorched or blackened but not charred; rotten wood is scorched to partially burned	foliage and smaller twigs partially to completely consumed; branches mostly intact	litter charred to partially consumed, some leaf structure undamaged; surface is predominantly black; some gray ash may be present immediately postburn; charring may extend slightly into soil surface where litter is sparse, otherwise soil is not altered	foliage and smaller twigs partially to completely consumed; branches mostly intact; less than 60% of the shrub canopy is commonly consumed	litter charred to partially consumed, but some plant parts are still discernible; charring may extend slightly into soil surface, but soil is not visibly altered; surface appears black (this soon becomes inconspicuous); burns may be spotty to uniform depending on the grass continuity	foliage and smaller twigs partially to completely consumed; branches mostly intact; less than 60% of the shrub canopy is commonly consumed	litter charred to partially consumed, but some plant parts are still discernible; charring may extend slightly into soil surface, but soil is not visibly altered; surface appears black (this soon becomes inconspicuous); burns may be spotty to uniform depending on the grass continuity	grasses with approximately two inches of stubble; foliage and smaller twigs of associated species partially to completely consumed; some plant parts may still be standing; bases of plants are not deeply burned and are still recognizable	
<b>Moderately Burned (2)</b>	litter mostly to entirely consumed, leaving coarse, light colored ash; duff deeply charred, but underlying mineral soil is not visibly altered; woody debris is mostly consumed; logs are deeply charred, burned-out stump holes are common	foliage, twigs, and small stems consumed; some branches still present	leaf litter consumed, leaving coarse, light colored ash; duff deeply charred, but underlying mineral soil is not visibly altered; woody debris is mostly consumed; logs are deeply charred, burned-out stump holes are common	foliage, twigs, and small stems consumed; some branches (> 6-1 cm in diameter) (0.25-0.50 in) still present; 40-80% of the shrub canopy is commonly consumed	leaf litter consumed, leaving coarse, light gray or white colored ash immediately after the burn; ash soon disappears leaving bare mineral soil; charring may extend slightly into soil surface	foliage, twigs, and small stems consumed; some branches (> 6-1 cm in diameter) (0.25-0.50 in) still present; 40-80% of the shrub canopy is commonly consumed	leaf litter consumed, leaving coarse, light gray or white colored ash immediately after the burn; ash soon disappears leaving bare mineral soil; charring may extend slightly into soil surface	unburned grass stubble usually less than two inches tall, and mostly confined to an outer ring; for other species, foliage completely consumed, plant bases are burned to ground level and obscured in ash immediately after burning; burns tend to be uniform	
<b>Heavily Burned (1)</b>	litter and duff completely consumed, leaving fine white ash; mineral soil visibly altered, often reddish; sound logs are deeply charred, and rotten logs are completely consumed. This code generally applies to less than 10% of natural or slash burned areas	all plant parts consumed, leaving some or no major stems or trunks; any left are deeply charred	leaf litter completely consumed, leaving a fluffy fine white ash; all organic material is consumed in mineral soil to a depth of 1-2.5 cm (0.5-1 in), this is underlain by a zone of black organic material; colloidal structure of the surface mineral soil may be altered	all plant parts consumed leaving only stubs greater than 1 cm (0.5 in) in diameter	leaf litter completely consumed, leaving a fluffy fine white ash, this soon disappears leaving bare mineral soil; charring extends to a depth of 1 cm (0.5 in) into the soil; this severity class is usually limited to situations where heavy fuel load on mesic sites has burned under dry conditions and low wind	all plant parts consumed leaving some or no major stems or trunks, any left are deeply charred; this severity class is uncommon due to the short burnout time of grasses	leaf litter completely consumed, leaving a fluffy fine white ash, this soon disappears leaving bare mineral soil; charring extends to a depth of 1 cm (0.5 in) into the soil; this severity class is usually limited to situations where heavy fuel load on mesic sites has burned under dry conditions and low wind	no unburned grasses above the root crown; for other species, all plant parts consumed leaving some or no major stems or trunks, any left are deeply charred; this severity class is uncommon due to the short burnout time of grasses	
<b>Not Applicable (0)</b>	inorganic preburn	none present preburn	inorganic preburn	none present preburn	inorganic preburn	none present preburn	inorganic preburn	none present preburn	