

SEEDING BURNED-OVER LANDS IN NORTHERN IDAHO

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Forest fires and controlled burns frequently result in large acreages of burned-over land. These burned-over areas are highly susceptible to erosion until adequate vegetative cover becomes established. Many of these areas have been seeded to grasses and legumes to provide a ground cover that minimizes erosion losses and stream pollution.

Seeding of burned-over areas gives a recreation and wildlife value far above the cost of seeding. Where burned-over lands are readily accessible to grazing animals, the cost of seeding can be recovered from pasturage in the first 3 or 4 years after planting before woodland cover returns naturally.

When

Burned-over forest land can be seeded in the fall after the fire, on the snow or in the early spring. Seedings made later than 12 months after the fire are not satisfactory because of competing vegetation. Fall seedings should be late enough to prevent seed germination until spring, as small tender seedlings may winterkill.

COOPERATIVE EXTENSION SERVICE
COLLEGE OF AGRICULTURE

Amount

Seeding rates of 10 to 15 pounds per acre are necessary for a reasonably good stand. Light burns often require a heavier seeding rate, since they do not provide as good a seedbed as heavy burns with a good ash cover.

Cost

Cost of seed ranges from \$5 to \$8 per acre. Broadcasting costs range from \$1 to \$3 per acre, depending on roughness of the land and accessibility. Airplane seeding can be made economically on steep or inaccessible areas or on burns of 100 acres or more.

Treatment

All grass seeds should be treated with a fungicide. If grasses are seeded without legumes, ground cover will develop faster by adding 30 to 60 pounds of nitrogen per acre. A properly inoculated legume should be included in pasture seedings to increase quantity and quality of forage. The application of 200 pounds of borated gypsum per acre to all legume seedings in northern Idaho aids in establishment and subsequent growth.

AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF IDAHO

EIGHT SEEDING TRIALS

Eight seeding trials on burned-over areas were made between 1934 and 1962. The objectives were to determine which species were most successful and which times of year were best for establishing long-lived seedings. Table I gives description data from these trials.

The Spirit Lake Seeding

A large area of timberland extending from Mount Spokane to the Spirit Lake-Blanchard Highway burned in August, 1939. The heavily logged area had consisted of second growth ponderosa pine, lodgepole pine, pinegrass, snowberry, ninebark and wild rose — all vegetation was completely killed.

The area gets 6 inches of rain a year and the soil is Kootenai gravelly silt loam.

In the fall of 1939 and early spring of 1940, 700 acres were seeded; other plots were seeded on Sept. 26 and Nov. 1, 1939, and on April 3, 1940. All seedings were fenced to prevent grazing.

By late May, 1940, all 22 seeded grasses had good stands. By September, the outstanding grasses were big bluegrass, beardless wheatgrass and crested wheatgrass. Thickspike, pubescent, intermediate and slender wheatgrasses, mountain brome grass, orchardgrass, timothy and redtop were also established in vigorous stands.

Canada wildrye, beardless wildrye, western wheatgrass, meadow fescue, bulbous barley, bulbous bluegrass and Kentucky bluegrass failed to maintain good stands through the second year.

Five legumes — alfalfa, alsike clover, hairy vetch, white clover and yellow blossom sweetclover — were seeded and failed to become established.

By 1941, it was obvious that late fall seeding was better than spring seeding. Orchardgrass, timothy and redtop were starting to spread by re-seeding.

Grass provides good cover and can be lightly grazed after 1 year.



By 1955, the best-established plantings on the 700 acres were timothy, orchardgrass and Kentucky bluegrass. By 1965, a near-complete canopy of lodgepole pine covered the area, native shrubs had returned, native pinegrass was dominant and the seeded species were hard to find.

The Liberty Lake Seeding

An area of ponderosa pine at the south end of Liberty Lake burned in late summer, 1939. The soil is Spokane loam.

On Nov. 1, 1939, the area was broadcast seeded and fenced to prevent grazing. On Sept. 20, 1940, these species had established excellent stands: blue wildrye, Canada wildrye, Draylar upland bluegrass, sheep fescue, slender wheatgrass and timothy. Species that had established good stands were: crested wheatgrass, pubescent wheatgrass and yellow blossom sweetclover.

On July 3, 1942, species that had excellent stands were: smooth brome grass, sheep fescue, Draylar upland bluegrass and Canada wildrye. Species with good stands were: timothy, pubescent wheatgrass and blue wildrye.

The area was never grazed and reverted to brush and trees in 10 years.

The Kendrick Seeding

An area of ponderosa pine on the benchlands in the canyon northwest of Kendrick burned in late summer, 1939. The soil there is Southwick silt loam.

On Nov. 9, 1939, and March 22, 1940, 25 grasses and 4 legumes were seeded. The fall plantings of grasses had better stands than the spring plantings, but the spring legumes were better than the fall. Alfalfa had a good stand, red clover fair, alsike clover poor and sweetclover was a failure. However, sweetclover that was planted on the snow on a nearby farm established an excellent stand.

The legumes disappeared in 1944; from then on the area was moderately grazed.

On June 20, 1955, species that had good to excellent stands were: tall oatgrass, intermediate wheatgrass, pubescent wheatgrass, orchardgrass, Kentucky bluegrass and reed canarygrass. Species that had fair stands were: timothy, redtop, smooth brome grass and fairway, crested and western wheatgrasses.

Species with poor stands were big bluegrass, blue wildrye, beardless wildrye, bulbous bluegrass, bulbous barley, meadow fescue, mountain brome grass and beardless, thickspike and slender wheatgrasses.

The Emida Seeding

This hot burn in 1951 was on an open flat meadow 1 mile south of Emida. The area was covered with second growth lodgepole pine, grand fir, white fir and willow. The poorly drained soil is Potlatch silt loam; annual rainfall is 30 inches.

On April 2 and May 2, 1952, 8 grasses and 11 legumes were broadcast planted. Grass seed was treated with a fungicide and half of each grass plot received 30 pounds per acre of nitrogen in the form of ammonium sulfate. Legume seed was inoculated

TABLE I

DESCRIPTIVE DATA ON PLANTING SITES IN NORTHERN IDAHO

Name and date of burn	Location	Topography			Soils	Av. annual precipitation	Forest type
		Elev.	Slope	Exp.			
Spirit Lake 1939-1940	1 mile north of Spirit Lake	2400	0-5%	--	Kootenai gravelly silt loam	23	Ponderosa pine Lodgepole pine
Liberty Lake 1939	10 miles southwest of Post Falls	2100	10-15%	NE	Spokane loam	23	Ponderosa pine
Kendrick 1939-1940	4 miles northwest of Kendrick	1200	5-15%	SW	Southwick silt loam	24	Ponderosa pine
Emida 1952	1 mile south of Emida	2700	0-1%	--	Potlatch silt loam	30	Lodgepole pine Grand fir White pine
Sandpoint 1944	2 miles west of Sandpoint	2200	10-15%	NE	Pend Orielle gravelly loam	30	Douglas fir Western larch White pine
Priest River 1944	10 miles north of Priest River	2500	5-10%	SW	Clayton silt loam	30	Ponderosa pine Douglas fir
Sandpoint pipeline 1962	4 miles southwest of Sandpoint	2200	10-40%	N	Clayton- Kootenai silt loam	30	Douglas fir Western larch
Bonnars Ferry pipeline 1962	2 miles east of Bonnars Ferry	1900	5-70%	E	Kootenai sandy loam to silt loam	23	Douglas fir Western larch

with the appropriate culture of *Rhizobium* and half of each legume plot received 300 pounds per acre of gypsum plus 40 pounds of agricultural borax.

Grasses planted were orchardgrass, Manchar smooth brome grass, tall fescue, Sherman big bluegrass, timothy, Greenar intermediate wheatgrass, redtop and Durar hard fescue. All responded well to nitrogen.

Legumes planted were perennial vetch, Cascade birdsfoot trefoil, flat pea, Kenland red clover, cicer milkvetch, alsike clover, sickle milkvetch, yellow blossom sweetclover, white clover, black medic and Nomad alfalfa. They gave excellent responses to gypsum and boron.

By August, 1952, all species had established vigorous stands. Growth was best in areas with deep ashes.

In 1955, grasses with the best stands were: orchardgrass, redtop, Durar hard fescue, timothy and tall fescue. Legumes with the best stands were: white clover, Cascade birdsfoot trefoil, Kenland red clover, alsike clover and Nomad alfalfa.

Cattle grazed on all species except cicer milkvetch. The land was heavily grazed for 5 years, then was cleared for cropland.

The Sandpoint Seeding

There was a controlled burn in 1943 at a logged-over site 2 miles west of Sandpoint. The area of rolling hills had been covered with Douglas fir, western larch, white pine and grand fir with an understory of pachistima. The soil is Pend Oreille gravelly loam, underlain with a substrate of gravel; it has a low water-holding capacity.

On April 7, 1944, the area was broadcast seeded to two forage mixtures, each on a 2-acre plot. One

mixture contained 10 commonly used grasses and legumes and the other contained 9 grasses and legumes not in general use.

The area was heavily grazed each year, including the year of seeding. All grasses established good stands. Legume stands were erratic, with only birdsfoot trefoil and white clover rated fair or better.

In 1955, species with the best stands were: big bluegrass and hard fescue, with varying amounts of timothy, intermediate wheatgrass, blue wildrye and birdsfoot trefoil. There were no stands of redtop, Alta tall fescue, orchardgrass, tall oatgrass, smooth brome grass, white clover, Ladak alfalfa, alsike clover, sweetclover or cicer milkvetch.

The Priest River Seeding

In 1944, an area 10 miles north of Priest River burned. The rough mountainous land at about 2,500 feet had been covered with Douglas fir, western larch and grand fir. The soil is Clayton silt loam; annual rainfall is 30 inches.

On Nov. 1, 1944, plots were broadcast seeded with 20 grasses and 7 legumes. Half of each plot received 100 pounds of gypsum per acre; legumes still showed the beneficial effects of gypsum in 1946. The plots were fenced, with light controlled grazing allowed after 1945.

All species established fair to excellent stands except: Topar pubescent wheatgrass, Greenar intermediate wheatgrass, white clover, Madrid yellow blossom sweetclover and sickle milkvetch.

By 1955, brush was dense and had invaded most of the plots, reducing forage production about 50 percent. Creeping red fescue was outstanding in preventing brush encroachment, but ponderosa pine seedlings were abundant in this plot anyway.

Establishment of seedling trees seemed to be as good in the seeded plots as in the unseeded areas.

Orchardgrass reseeded readily and rapidly invaded many legume plots and some grass plots; red-top and timothy also reseeded and invaded. Red fescue and reed canarygrass provided fair ground cover.

Cicer milkvetch was the outstanding legume, but it was grazed only slightly by livestock. Cascade birdsfoot trefoil was the only other legume that persisted.

By 1960, 16 years after planting, trees dominated the seeding area and few grasses and legumes were left.

The Pipeline Seedings

In 1961, a 36-inch gas pipeline was installed through northern Idaho; some subsoil remained on the surface after the pipe was buried. The soil and

subsoil was a mixture of Clayton-Kootenai silt loam. Seedlings were planted on the 100-foot cleared right-of-way.

On March 14, 1962, Durar hard fescue, S-143 orchardgrass, Alta tall fescue and Bromar mountain brome grass were broadcast alone and in various combinations along the pipeline near Sandpoint. All except Bromar mountain brome grass established excellent stands.

Durar hard fescue gave good ground cover in 2 years; Alta tall fescue and S-143 orchardgrass in 3 years. The area was moderately grazed and by 1967 Douglas fir, larch, ponderosa pine and willow were becoming prominent.

On April 3, 1962, the same grasses plus timothy were broadcast along the pipeline near Bonners Ferry in a rough foothill area. Durar hard fescue, S-143 orchardgrass and Alta tall fescue provided more ground cover and forage than did timothy.

SUGGESTED MIXTURES

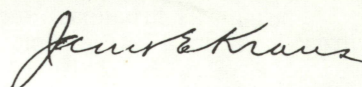
Various grasses and legumes are adapted to specific sites with regard to soil moisture conditions. The following table lists the kinds of sites,

the species that will do well in each and the seeding rates that will establish good stands.

KIND OF SITE	VARIETY	SEEDING RATE
Droughty (ponderosa or lodgepole pine) with less than 24 inches of rain yearly	For cover only: Nordan crested or Siberian wheatgrass;	5 lbs/A
	Durar hard fescue or Sherman big bluegrass	5 lbs/A
		10 lbs/A
Moist (Douglas fir, grand fir, western larch, white pine) with more than 24 inches of rain yearly	For cover and pasture: Nordan crested or Siberian wheatgrass;	6 lbs/A
	Durar hard fescue or Sherman big bluegrass;	3 lbs/A
	Topar pubescent wheatgrass, Greenar or Oahe intermediate wheatgrass or Manchar smooth brome grass;	4 lbs/A
	Sweetclover	1 lbs/A
		14 lbs/A
	For cover only: Redtop or timothy;	3 lbs/A
Creeping red fescue;	6 lbs/A	
Alsike clover	1-2 lbs/A	
	10-11 lbs/A	
Poorly drained (western hemlock, cedar, alder) with more than 35 inches of rain yearly	For cover and pasture: Manchar smooth brome grass or orchardgrass;	4 lbs/A
	Alta tall fescue;	6 lbs/A
	White dutch clover	1-2 lbs/A
		11-12 lbs/A
For cover and/or pasture:	Creeping meadow foxtail or reed canarygrass;	6 lbs/A
	Alsike and/or white dutch clover	8 lbs/A
		1-2 lbs/A
		7-10 lbs/A

You may get information for planting a specific site from the local offices of the County Extension Service or the Soil Conservation Service District.

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