6-1938

EC119 Brome Grass for Erosion Control

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Extension Circular 119

June, 1938

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THE UNIVERSITY OF NEBRA
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Brome Grass for Erosion Control

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BROME grass (*Bromus inermis*) is a tall, leafy, long-lived, sod-forming grass introduced from Russia a little over 50 years ago. The first seedings were made in Nebraska forty years ago. Brome-grass seedings in this state increased in popularity up to the time of the World War. Then the raising of grain crops was stressed and grasslands were turned to cultivation.

Severe erosion has taken place on steep slopes that were broken up and cultivated, and brome grass is now becoming popular because of its ability to control erosion.

Brome grass is also known as smooth brome, Hungarian brome, Russian brome, and awnless brome.

Characteristics of Brome Grass

Brome grass is a sod-forming perennial, spreading aggressively underground by rootstocks or rhizomes. It forms a dense sod which is an excellent soil binder and withstands considerable abuse from trampling by livestock. The profusely branched root system not only holds soil effectively while the grass is growing, but it also adds much organic matter and fiber to the soil, which makes it more resistant to erosion when the sod is plowed and the cultivated crops are planted. At Lincoln a four-inch layer of sod from a four-year-old brome-grass field contained 3,740 pounds of dry matter per acre. The roots of brome grass may penetrate the soil to a depth of seven or eight feet, but the general working level is the upper three and one-half feet of soil.

Brome grass starts spring growth two weeks earlier than most of the native grasses, and usually stays green later in the fall. The spring growth is a leafy basal mat with leafy flowering stalks shooting up about the middle of May. The flowering stalks may attain a height of four feet or more under favorable conditions. Seed is produced abundantly in open panicles that are from six to ten inches long.

Individual plants of brome grass show marked variations in leafiness, height, and vigor of tillering and rhizome formation. Strains may be developed that will be superior for pasturage while others may be more desirable for hay. However, such specific types, varieties, or strains are not available on the market at the present time.

Adaptation to Climate and Soils

Brome grass is winter hardy and resistant to drouth but not adapted to hot climates. It has been successfully grown as far south as Nuckolls county in Nebraska, and as far west as North Platte, while the northern limit is somewhere in Canada. Under normal conditions, brome grass grows more continuously through the summer months than bluegrass.

Some of the photographs were obtained through the courtesy of the Soil Conservation Service.

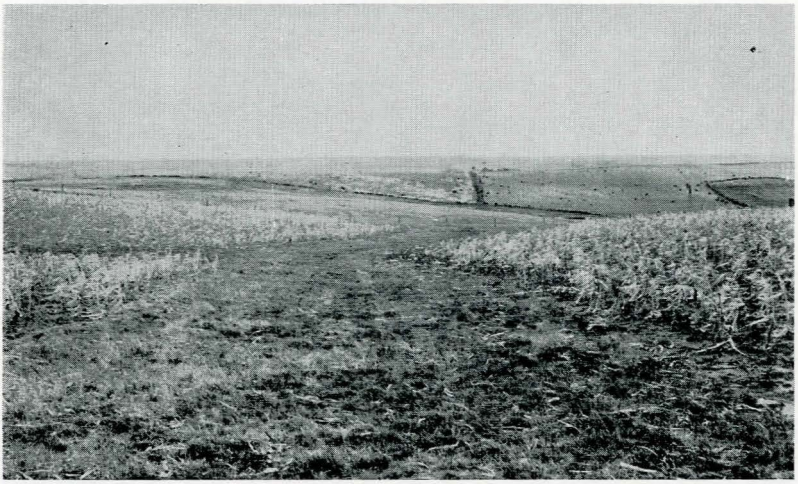

FIG. 1.—Original stand of brome in this draw has caught silt for thirty years, and actually raised the base of the depression.

Brome thrives best on deep, fertile silt or clay loams, and succeeds fairly well on sandy soils. It does not do well on sandy sterile soil where there is a shortage of available nitrates. Brome grass is likely to become sod bound in its second or third year unless nitrates are supplied through manure, commercial fertilizer, or legumes. Planting alfalfa with brome grass is the most practical way to prevent this condition. Although the alfalfa will be eventually crowded out by the grass, yields will be greatly increased because of the nitrogen made available. An old stand of brome which has become sod bound can be greatly improved by applications of manure.

Brome grass will withstand considerable flooding and silting. It is fairly tolerant of alkali, but less so than western wheat grass.

Values of the Crop—Pasture, Seed, and Hay

Brome grass has greater carrying capacity than bluegrass or the native grasses. It is very palatable, being considerably superior to orchard grass, timothy, and the wheat grasses in this respect.

A common yield of seed is from 250 to 500 pounds per acre. The smaller yield may be expected the first year after a fall seeding, or during a dry season. Brome-grass seed usually returns a much higher income per acre than corn, wheat, or other grain. The seed matures about the same time as small grain and can be successfully harvested with a grain binder or a combine. It can be threshed with the ordinary grain separator by cutting off the wind and using a special riddle. Since the seed weighs but 14 pounds per bushel it will need recleaning after it is threshed.

Although brome grass is better for grazing, it will make good hay if cut while at the height of the blooming period or immediately thereafter.

FIG. 2.—Brome grass harvested for seed is a profitable crop.

If cut when the seed is mature, most of the basal leaves still remain, and a good horse hay comparable to prairie hay can be produced.

Uses in Controlling Erosion

In Crop Rotations When brome grass is seeded with alfalfa, it covers the soil not occupied by the crowns of the legume and reduces soil loss. Later when the sod is plowed the field is not subject to the severe gullying that frequently follows the plowing of a stand of old

FIG. 3.—Level pasture terraces catch runoff on steep slopes. These are built before seeding to brome grass.

alfalfa. Brome-grass roots decay more slowly than do those of legumes, and the fertility provided is thus less likely to overstimulate the following grain crops. The fibrous roots of the brome grass granulate the soil and thus make it more receptive of rainfall.

On Steep Cultivated Slopes and in Field Draws

Brome grass will conserve whatever top soil remains and will tend to create a new top soil. In the meantime it will produce a greater net income than crops that require annual seedbed preparation, seeding, and cultivation. Level pasture ridges or terraces are a valuable supplement in holding water on steep slopes, particularly while the grass is getting established.

FIG. 4.—Getting a draw ready for grass seedings. After a broad flat base is formed in the draw, the soil is packed firmly and seeded.

The value of a field that is now divided by a noncrossable ditch will be increased by plowing or grading the ditch in, and establishing a grass sod. The dense mat of brome-grass roots forms a tough carpet that keeps rapidly flowing water from cutting away the soil as long as there is a complete cover. It is well to inspect the young stand of grass occasionally and repair rills or breaks with pieces of sod. The seeded strip should be extended far enough up the banks of the draw to prevent cutting outside of the grass strip.

FIG. 5.—The "dead" furrows or diversion ditches carry runoff water along the sides of the draw while the grass seedlings get started in the center. The diversions are plowed in as soon as the grass is established.

For Buffer Strips and Sod Check Dams The seeding of grass strips bordering wider strips of contour-tilled crops provides "buffers" that act as barriers for rills or finger gullies which might otherwise continue down the slope. The grass slows down the speed of runoff, thereby causing the silt to drop out and also diminishing its erosive power. The sod also absorbs water faster than the cultivated soil. Such strips of grass provide permanent guide lines for contour farming.

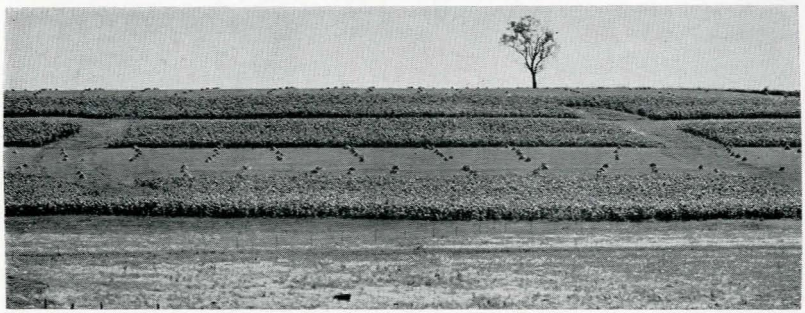

FIG. 6.—The brome-grass buffer between the two top strips of corn checks small gullies that start near the top of the slope. In strip cropping it is essential that all major depressions and natural waterways be seeded and left permanently in grass.

In small drainage areas, cutting ditches can be successfully stabilized by building an earth fill across the ditch and covering it with sod. The upstream slope should be at least twice as long, and the downstream slope

about four or five times as long as the height of the dam. The center of the dam is flat and level, with the sod on the sides extending up on the banks of the ditch. Sodding is successful any time except during dry hot weather. In sodding it is always very important to tamp the sod firmly, thereby excluding air pockets around the roots.

FIG. 7.—Looking downstream on a series of sod checks that will stabilize the narrow ditch.

FIG. 8.—Side view of sod dam. "X" is lower edge of dam and shows the very gradual slope.

For Sod Flumes and Terrace Outlets

Overfalls in gullies can be successfully controlled by grading the ground back to a slope of 20 per cent or less, and packing it firmly before sodding. The bottom of the flume should be made as flat as possible. Sodding should start at the bottom and continue up the slope. Where there is considerable drainage it might be necessary to hold the sod in place until it can set roots. This can be done by staking down woven wire flat on the sod.

Excess water from terraces can be safely conducted to the natural drainage-ways with the least expense by means of sod-covered outlets.

A field is ready to terrace as soon as the grass can be established in the outlet. If excavation is necessary to get a wide flat outlet, heavy applications of barnyard manure will increase chances of getting a good stand. When seedings fail, sodding may be practical. Sod should be cut in strips on the contour. If the terrace channel is fertile soil, a two-inch sod is thick enough, while sod four or five inches thick is better on poor soil.

Seeding

An ideal seedbed for brome grass is a fine, firm, mellow, moist soil free from weeds or weed seed.

The best time to seed depends on moisture conditions. If summer-fallowing is necessary to store subsoil moisture, fall seedings previous to September 15 are preferable. With fall seedings it is desirable to seed a nurse crop, at not over half the usual rate per acre, of oats or barley. This will control erosion during the fall and winter, while the brome grass is getting started. During seasons of drouth and grasshopper infestation, seedings delayed late enough in the fall to prevent germination

before spring may produce an early spring growth and thus develop into successful stands before hoppers and hot winds are serious. Late-spring and summer seedings generally fail.

The seed should be covered from one-half to three-fourths of an inch or slightly deeper if the topsoil is dry or sandy.

FIG. 9.—Grass in this pasture disposes of terrace water, and receives irrigation.

Seeding with a drill is preferable to broadcasting, as the seed is more uniformly covered. Brome-grass and alfalfa seed do not mix well and should be seeded separately. When seeding with a drill designed to sow fine seed as well as grain, the alfalfa can be nicely seeded in the fine-seed box with the brome-grass seed in the grain box. Special agitation is necessary to keep the seed going down into the bottom of the seed cups. The seed box should not be filled to more than one-half capacity. Stirring with a stick to prevent "coning" of the seed is effective, or a more efficient agitator or shaker can be made by placing on the seed a long narrow board with two 16-penny nails driven so as to extend into each seed cup. By means of a handle fastened to this board all seed cups can be agitated by one movement. If the seed is broadcast, it may be covered with either the harrow, the roller, or with the drill when the alfalfa is seeded. A roller should be used after the seed is covered or drilled.

The usual rate of seeding brome grass is from twelve to fifteen pounds per acre with three or four pounds of alfalfa. Erosion is more efficiently controlled by a complete cover afforded by a good stand. All brome-grass seedings should have only light grazing, if any, the first year.

Distributed in furtherance of Acts of May 8 and June 30, 1914. Extension Service of the College of Agriculture, University of Nebraska, and U. S. Department of Agriculture cooperating. W. H. Brokaw, Director.

[6-38-10M]