New Understory Cultivars for Pacific Northwest

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The history of rangelands in the Pacific Northwest is similar to that of semiarid rangelands in other regions of North America. Large areas were grazed to a point where not only the taller grasses were reduced but the understory plants were eliminated.

Understory plants play an important role in the range ecosystems. They provide diversity, complement taller grasses in maintaining ground cover, provide forage for grazing animals and wildlife, and reduce susceptibility to weed invasion. Plant diversity is highly desirable on rangelands and should be emphasized in reseeding programs.

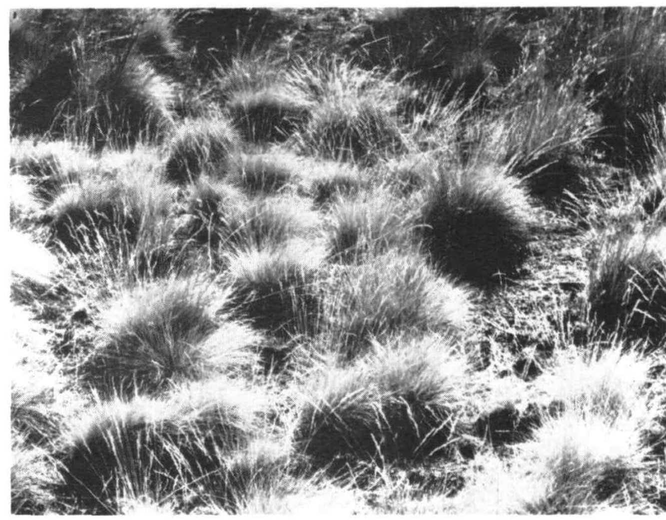
In semiarid regions of the Pacific Northwest, understory plant materials are also valuable in the treatment of critical areas to protect soil from water and wind erosion. The need for suitable understory grasses in the Northwest led the Soil Conservation Service (SCS) to develop and test two grasses for this purpose: sheep fescue (*Festuca ovina*) and Canby bluegrass (*Poa canbyi*). Extensive field tests on numerous soils and range sites in Washington and Oregon indicate these species have value as understory grasses.

During the past 44 years, plot trials with sheep fescue have been conducted at the SCS Plant Materials Center in Pullman, Wash., in outlying experiment stations at Moro and Condon, Ore., and Lind and Goldendale, Wash.

Understory plantings of sheep fescue at Goldendale from 1938 to 1941 showed that it makes excellent ground cover, grows a dense root mass that holds the soil in place, and establishes rapidly when seeded into young alfalfa stands. Its growth is mostly basal and provides excellent ground cover after the harvest of the alfalfa hay crop.

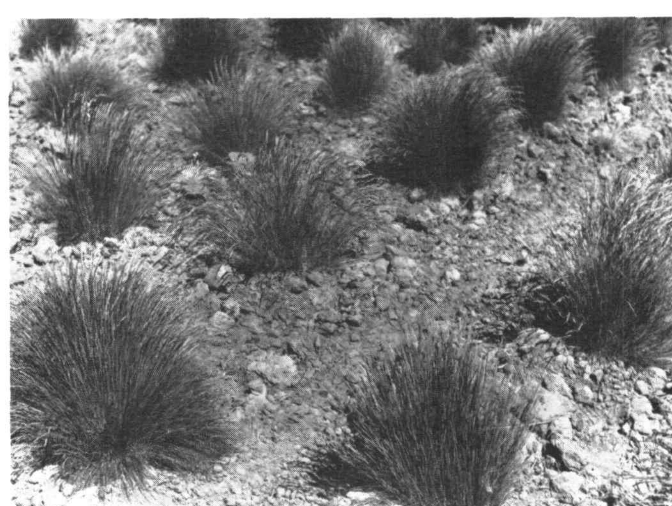
Sheep fescue is a good root producer whether grown alone, in a mixture with legumes, or with taller grasses. Trials show that it resists invasion of cheatgrass (*Bromus tectorum*) and other weedy plants and improves soil structure. Although it produced considerably less forage than other adapted grasses, its principal value is its root production capacity, which makes it an excellent erosion control plant. Sheep fescue tested at Moro produced an average of 855 pounds per acre (air dry) of top growth annually for 30 years. One sampling in an established stand produced 3,072 pounds per acre (air dry) of roots in the upper 8 inches of soil, while Canby bluegrass produced 3,606 pounds.

Sheep fescue was introduced from Turkey in 1934, and a cultivar, P-274 (Covar), was released for commercial seed production in the fall of 1977. *Covar* is cold- and drought-tolerant, succeeds better than many grasses on sandy and gravelly soils, and can be grazed early in spring. It is dwarf, blue-green, densely tufted, with leaves 2″–7″ high, erect growing with abundant fine stems to a height of about 18″, and grows in 8–14-inch precipitation zones.



Original sheep fescue.

Canby bluegrass was collected from the Blue Mountains in Washington in 1935 and seeded with several other (early Spring growing species) vernal-dominant bluegrasses in initial evaluation at the Pullman, Wash., Plant Materials Center in 1936. Selection number P-851 was selected and increased for testing as an understory grass in range and erosion control seedings.



Breeder's block "Covar" sheep fescue growing at the Pullman, Wash. SCS Plant Materials Center.

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Canby bluegrass has abundant basal leaves and grows to a height of about 18 inches. Plot trials were made at Moro, Lind, Condon, and Goldendale. It was further tested in field plantings at locations throughout Washington, Oregon, and Idaho. Fifteen years of data collected at Lind and Moro have demonstrated the value of Canby bluegrass as an understory grass. It was released for commercial seed production in 1978.

Another species tested was Idaho fescue (*Festuca idahoensis*), which appeared promising, especially at Condon. Idaho fescue leaves grow to a height of about 12 inches and seed stocks vary from 10 to 30 inches. However, it is a consistently poor seed producer.

Also tested, Sandberg bluegrass (*Poa sandbergii*) is similar to Canby bluegrass. Both are vernal-dominant bluegrasses that use excess spring moisture for growth during late spring and summer. They have large root systems and are compatible with crested wheatgrass and bluebunch wheatgrass. Canby bluegrass, however, is more robust than Sandberg bluegrass and provides more ground cover with bunch-type wheatgrasses. Also, the overall vigor and production of bunchgrass stands are considerably improved when vernal-dominant bluegrasses such as Canby are seeded. Further, results indicate that a bunchgrass-bluegrass mixture is superior to a single-species stand of grass in controlling weeds.

In mixtures with crested wheatgrass (*Agropyron cristatum*) and alfalfa (*Medicago sativa*), Canby bluegrass provided stands and yields comparable to the tall-growing species seeded alone in field evaluation plantings at Moro with 12 inches precipitation, at Lind with 11 inches, and at Moxie, Wash., with 7½ inches. At all three locations with understory grasses in the mixtures, the soil-holding ability of bunch-type wheatgrass improved.

Mixture trials at Moro showed that crested wheatgrass and other bunchgrasses dominate and reduce sod grasses when seeded together. However, big bluegrass (*Poa ampla*) and sheep fescue appear to dominate when seeded with crested wheatgrass. Idaho fescue and sheep fescue increased and dominated each mixture in which they were included. Big bluegrass dominated everything except the small, fine fescues, but weakened after 15 years and began to be replaced by bluebunch wheatgrass and crested wheatgrass. The dominance of the fine fescues seems to be permanent.

In grass plots seeded at Moro in 1943 cheatgrass and bulbous bluegrass (*Poa bulbosa*) invaded the trial area but were reduced where understory grasses were planted. Sheep fescue was more effective than Idaho fescue in preventing establishment of invading weeds.

The latest field planting of sheep fescue and Canby bluegrass as understory plants was made on 186 acres of a 4,000-acre area that burned in late summer of 1975. This area is on the south slope of the Saddle Mountains in central Washington. The seeding was done cooperatively by the Washington State Department of Game, Bureau of Reclamation, Bureau of Land Management, and the Energy Research and Development Administration.

Before the fire the rangeland was in poor condition. Only Sandberg bluegrass and cheatgrass had been growing in most of the area that burned. The fire provided an ideal opportunity to seed the area. So, in the fall of 1976, rangeland drills were used to seed "Nordan" crested wheatgrass, thickspike wheatgrass, "Whitmar" beardless wheatgrass, Canby bluegrass, *Covar* sheep fescue, and bulbous bluegrass. A major concern was the extreme hazard of wind erosion if a seedbed were prepared, so only a portion of the planting had a prepared seedbed. This could also determine the amount of soil movement caused by wind and show any difference in grass emergence between the two areas. All cooperating ranchers and agencies agreed to defer grazing the seeded area for 3 years to allow the grasses to become established.

It was a dry year, the seeded area receiving only 3.1 inches of moisture during a whole year from September 1976 to September 1977. In spite of this, a field check in October 1977 showed remarkable germination of all seeded species. Evaluations indicated that a high percentage of the seed remained dormant until October, 1977, when it was germinated by the fall rains.

The job isn't over because the planting will need to be further evaluated to determine the seeded species' value in resisting invasion by cheatgrass, other weedy plants, and the less desirable Sandberg bluegrass.

These understory grasses provide good soil protection when grown alone or in mixtures with legumes or taller grasses. Sheep fescue and Canby bluegrass appear to be the most suitable.

Deadlines for *Rangelands*

To insure prompt publication, **advertising, position announcements,** and **news items,** must reach the Denver office, 2760 West Fifth Avenue, Denver, Colorado 80204, by the 20th of the month preceding the publication of *RANGELANDS*. Deadlines for such items for this magazine, then, are January 20, March 20, May 20, July 20, September 20, and November 20.

RANGELANDS is scheduled to be delivered to the mailers during the last week of the month of issue – February, April, June, August, October, and December. This means that most readers will not receive the publications until some time during the next month—an important fact where deadlines for position applications are critical.

Manuscripts for feature articles and lengthy news items should be sent directly to the editor, Danny Freeman, 316 Whitney, Prescott, Arizona 86301. He will inform the author of the probable date of publication of accepted manuscripts.