United States Department of Agriculture

Soil Conservation Service

Program Aid Number 1378

'Lassen' antelope bitterbrush

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'Lassen' antelope bitterbrush, *Purshia* tridentata *(Pursh)* OC, is recommended for restoring depleted rangelands, burned areas, mined lands, and other disturbed sites in the Intermountain West. It is mainly valuable for improving forage production and quality for big game on fall and winter ranges. It was selected for seedling vigor, productivity, upright growth habit, palatability, forage availability, seed production, and retention of overwintering leaves. Winter crude protein content averages 8 percent, with 30 percent digestibility.

Lassen was released in 1984 by the U.S. Department of Argiculture's Forest Service, Shrub Sciences Laboratory, and Soil Conservation Service, and the Utah Division of Wildlife Resources. Seven other agencies in California, Idaho, Nevada, and Oregon cooperated.

Description

Mature plants are large, leafy shrubs with few basal stems. They have spreading crowns, heavy lateral spur production, and long ascending leaders. The average height is 8 feet with a 10-foot crown. Floral and vegetative morphology is typical for antelope bitterbrush, with little introgression from Stansbury cliffrose, an unpalatable related species native to the Southwest.

Flowers are small, varying from white to yellow, and produced profusely along each leader. The seeds are large for the species—15,500 per pound. They are about one-fourth inch long and obovate. Seeds, stems, and leaves are nontoxic.

Lassen's uniform, erect growth habit contrasts with more decumbent, layering *forms*. Users are encouraged to consider the various forms of bitterbrush in choosing a strain best suited to their needs.

Adaptation

Lassen originates from seed collected from native stands near Janesville in Lassen County, California. It is a representative ecotype that lies in a narrow, 50-mile strip at the base of the eastern side of the Sierra Nevada Mountains from Susanville *to* Doyle. It is associated with big sagebrush and rabbitbrush. It occurs naturally on dry lake beds, alluvial fans or terraces, and low foothills. The soils are deep, gravelly, loamy coarse sands derived frorn granite, with pH ranging from 6.0 to 7.0.

Tests have shown that Lassen has high potential for use on deep, coarse, well-drained, neutral to slightly acidic soils in areas that have 12 to 24 inches of annual precipitation. It is not well adapted to basic, fine-textured, or poorly drained soils. Lassen has performed well at sites in eastern Oregon, central and southern Idaho, northern California, and western Nevada at elevations of 3,000 to 6,000 feet. It performs best on sites that support antelope bitterbrush-grass, basin big sagebrush-grass, mountain brush, and ponderosa pine-antelope bitterbrush plant communities.

Lassen has also performed adequately in Utah and is probably adapted wherever antelope bitterbrush occurs naturally. Another strain, however, is being developed for the eastern part of the area of adaptation and a layering form for very sandy sites that are subject to blowing.

Establishment

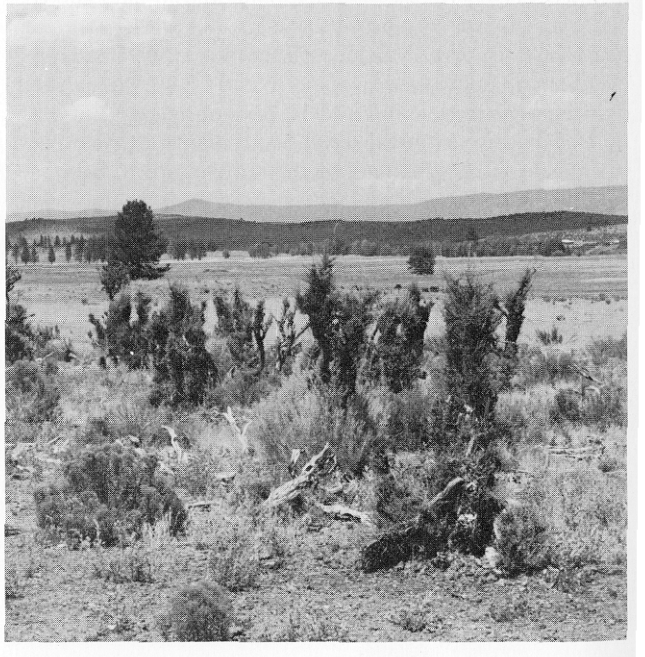
On rangeland sites, Lassen antelope bitterbrush should be seeded in late fall or winter to permit field stratification. Pretreatment with hydrogen peroxide is required to break dormancy for spring seeding. Seedlings are susceptible to late frosts. Plants develop very slowly and must be protected from competition during the first two seasons. Recommended seeding rates are 1 to 3 pounds of pure live seed per acre. Antelope bitterbrush seedlings are often transplanted on critical sites. In such cases, moisture must be adequate to ensure survival in the first year. One-year-old bareroot or containerized seedling stock, 6 to 24 inches tall, is recommended.

Several insects and diseases are known to damage the foliage, seed, and seedlings of antelope bitterbush, and Lassen is no more or less susceptible than other species. High-density grasshopper populations can destroy Lassen seedlings.

Management

Lassen is used by big game and livestock during all seasons and remains productive despite heavy browsing. Stand conditions generally deteriorate, however, when annual use

Lassen at **the** *Elysian Valley collection site*



Lassen growing near Janesville.

exceeds 60 percent of the annual growth. Lassen is not fire-tolerant and resprouts only infrequently following burning.

Propagation

The area where Lassen originates contains large, dense populations of this ecotype, as many as 200 plants per acre covering hundreds of acres. Since 1954, private seed dealers and state agencies have collected large quantities of seed from this area—a primary source of antelope bitterbrush seed used for reseeding in the entire Western United States. In some years, more than 10,000 pounds of seed have been harvested. Recent development in the area, however, threatens to significantly reduce the availability of this area for seed collection, which is one of the reasons the Lassen strain has been formally released. Seed dealers and state agencies will continue to collect from this area and can now certify seed meeting purity and germination standards.

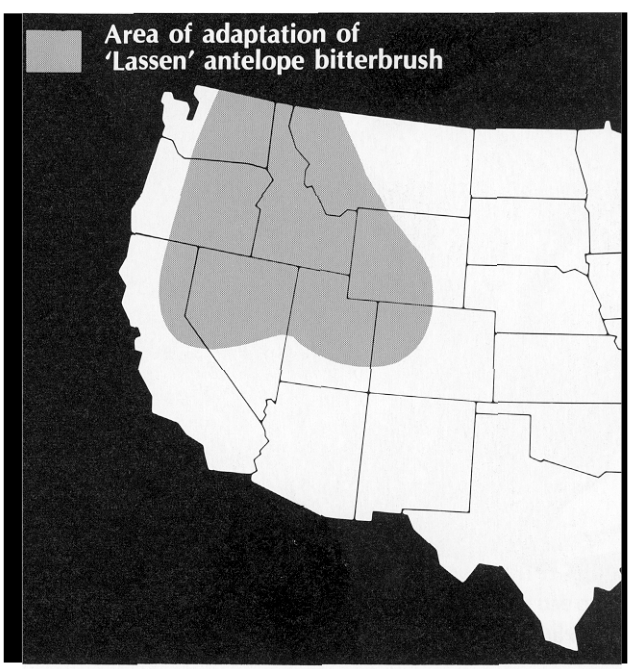
A foundation seed exclosure is being maintained to provide seed for establishing seed orchards outside the collection area. A 12- by 12-foot to 16- by 16-foot spacing is recommended for Lassen seed orchards. Plants in wild-land stands reach full production in 8 to 20 years, but this period may be reduced to about 5 years for seed orchards. Seed matures evenly and is harvested by hand in early July. Mature seed must be harvested within 3 to 10 days of ripening, as it is quickly dispersed from the shrub. Seed collection and orchard maintenance are simplified by the upright growth habit. Experience has shown dryland seed orchards produce as much as 200 pounds per acre, but the potential is probably somewhat higher.

Seeds are easily cleaned to 95 percent purity, using a two-screen fanning mill and barley debearder. Germination usually exceeds 80 percent and seeds remain viable for several years under good storage conditions.

Availability

Plants for seed orchard establishment are available from the Nevada Division of Forestry (201 S. Fall Street, Carson City, NV 89710). Iriformation on certification of wild-land collections can be obtained from the California Crop Improvement Association (Agronomy and Range Science, University of California, Davis, CA 956161.

For more information on the availability and use of Lassen antelope bitterbrush, contact your local Soil Conservation Service office or the Forest Service, Shrub Sciences Laboratory (735 N. 500 E, Provo, UT 84601).

Assistance is available without regard to race, creed, color, sex, age, national origin, or handicap condition.

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