

Comparisons Between Fourwing Saltbush and Antelope Bitterbrush In The Northern Great Basin

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Saltbush had attained mature size at 4 years of age. Female plant in center.

Fourwing saltbush (*Atriplex canescens*) and antelope bitterbrush (*Purshia tridentata*) are shrubs native to the Great Basin of northwestern United States. Both provide high quality browse forage for ungulates including mule deer and livestock and have consequently been planted or seeded on degraded rangelands, especially within the big sagebrush community.

Bitterbrush was observed to be more preferred than saltbush by mule deer. Conversely, saltbush produced greater annual growth than bitterbrush, especially during periods of low precipitation.

Southeastern Oregon's Malheur County, a vast area of sagebrush/bunchgrass, was the site for this study.

In the spring of 1964, a 4,595 acre area was plowed using "Brushland plows," with 180 acres of the area dedicated to big game habitat improvement.

The larger area was drill seeded with crested wheatgrass that autumn using "Rangeland drills." The smaller area was drill seeded with antelope bitterbrush using rice hulls as a bulk carrier.

The following March, fourwing saltbush was hand broadcasted and raked into the loose soil on approximately 5 acres of the smaller "wildlife" area. The site was subsequently fenced to exclude livestock but not mule deer that often use the area as winter range.

Seedlings of both shrubs were noted the next year. Long-term studies of plant growth and utilization by mule deer began in 1967 and continued until 1978. Annual growth (leaders) were measured each autumn on 10 randomly selected tagged plants of bitterbrush and 10 four-wing saltbush. Number of leaders measured varied among plants but normally averaged from 10 to 25 per shrub. Similar

measurements were conducted the following spring to determine the leader length following winter use by mule deer. Data were averaged for both species and expressed as a percent of the autumn leader length removed by browsing.

Precipitation data from a NOAA station at Westfall, Oregon, 10 miles west of the study site, were used to calculate crop year (September through June) precipitation. Growth responses of both species were compared to precipitation.

Figure 1 shows the difference between precipitation and growth of fourwing saltbush and bitterbrush during each of the study years. When moisture exceeded the mean, bitterbrush produced well; however in years of low moisture, fourwing saltbush was less adversely influenced and thus

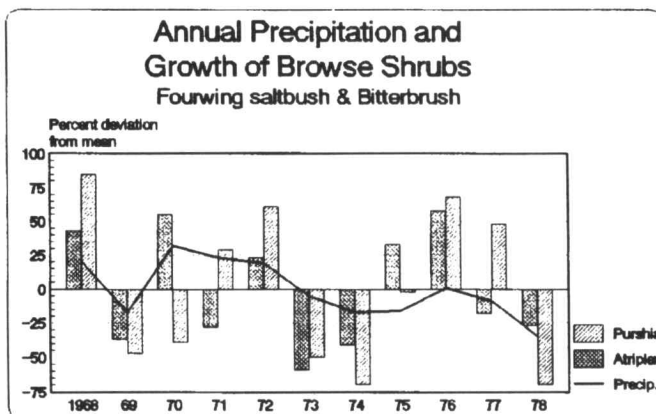


Fig. 1.



Saltbush shrubs 14 years old were continuing to produce well.

more productive than bitterbrush. Figure 2 arrays precipitation from the driest year (1978) to the wettest (1970).

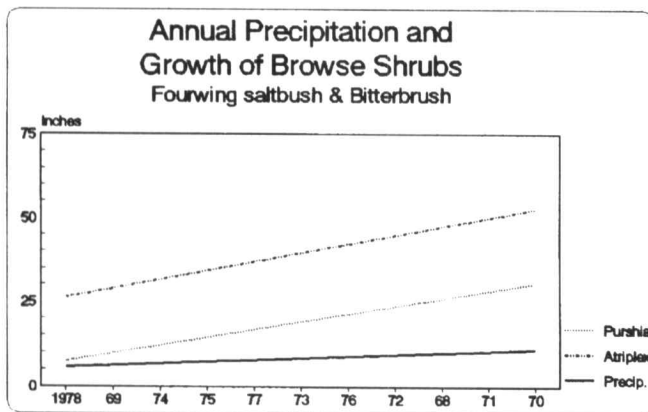


Fig. 2.

Corresponding annual growth of fourwing saltbush and bitterbrush are shown using linear regression analysis. Fourwing saltbush consistently had greater annual production than bitterbrush on this site. During the study, fourwing saltbush produced 210% the production of bitterbrush.

Most use of annual growth was by wintering mule deer. Figure 3 illustrates a comparison of the percent of the total growth taken each year. Use of bitterbrush exceeded that of saltbush in 7 of 8 years. Figure 4 compares the percent of total leader population that exhibited use with the extent of length utilization. Bitterbrush was a preferred browse for mule deer. Considering number of leaders use, bitterbrush exhibited 41% more use than fourwing saltbush. Leader

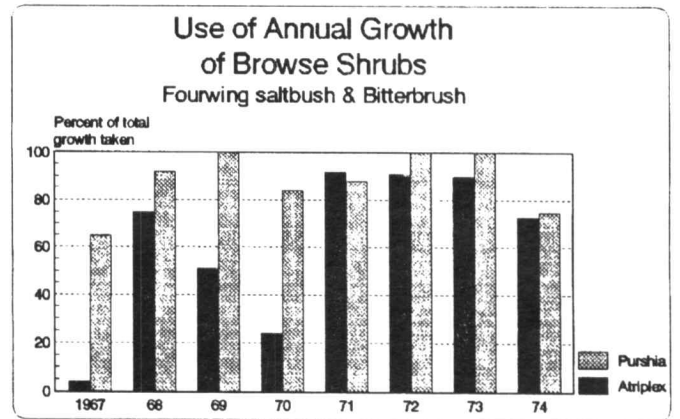


Fig. 3.

actually removed was 18% greater on bitterbrush than that removed from saltbush.

Management Implications

Within the big sagebrush community of the Great Basin, both antelope bitterbrush and fourwing saltbush are adapted native and valuable browse shrubs for wildlife and livestock. Bitterbrush was observed to be more preferred than

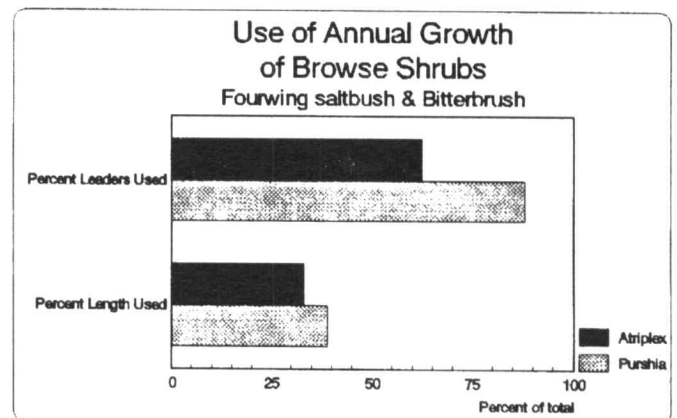


Fig. 4.

saltbush by mule deer. Conversely, saltbush produced greater annual growth than bitterbrush, especially during periods of low precipitation.

The lesser palatability of fourwing saltbush may well be an attribute because forage was available for wintering deer in times of stress and low precipitation. Bitterbrush was often entirely consumed by such times and can, consequently, contribute little to mule deer survival.

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