It is generally believed that burning associated with a subsequent droughty period can be especially damaging to bunchgrasses. The timing of the two fires in relation to the drought conditions of 1977 may have influenced the recovery of bluebunch wheatgrass at the two sites. At Lava Beds, the heavy 3.1 inch August rain occurred less than one month after the fire; at Crooked River, the drought followed immediately after the fire. In addition, Lava Beds received 61 percent of its normal precipitation between September 1976 and June 1977 while Crooked River received only 41 percent of its normal precipitation during this period. This combination of factors cannot be ignored when evaluating the effects of these two fires on bunchgrasses. However, edaphic and fire related factors appeared to be overriding influences in the Crooked River fire.

Careful evaluation of this area after the fire indicated that because of the steep slope, the soils had fallen away from the down hill side of each grass clump. This directly exposed some of the roots to the fire. Burned cavities up to 2 inches into the root zone were observed. The gravelly soil also had greater porosity which facilitated movement of hot air and water vapor into the root and bud zone. These features along with season of fire appeared to have been responsible for the first year damage to bluebunch wheatgrass plants. However, the amount of input attributable to each cannot be ascertained from this study.

On sites similar to those at Lava Beds, late spring burning appears to be a good method for controlling mountain big sagebrush with minimal damage to bunchgrasses. Since little detrimental impact occurred on either bunchgrass at the Lava Beds, it was felt the fire prescription had been satisfactory for these sites. On steep areas where the root crown of bunchgrasses is exposed to the flames, burning for sagebrush control may not be feasible.

EFFECT OF HARVEST DATE ON FIVE BUNCHGRASSES OF EASTERN OREGON

C. M. Britton, F. A. Sneva, and R. G. Clark

One of the basic problems of range management is when to graze the range. Plants grazed during early growth have difficulty in maintaining a productive growth status since removal of leaves interferes with development of an adequate root system. This early growth phase of shoot and root growth usually is completed by early May in eastern Oregon. What happens to the various grasses after this early growth phase is also an important factor because this is the normal period of harvest by grazing.

A study was initiated to investigate the effects of harvesting range grasses during the normal period of grazing. Objectives of this research were to evaluate different harvest dates with respect to subsequent changes in basal area of the grass plants and the resultant changes in yield.

METHODS AND PROCEDURES

This study was conducted at the Squaw Butte Range Unit of the Eastern Oregon Agricultural Research Center. In 1976, individual plants of five bunchgrass species were marked and allocated to five harvest dates. Bunchgrasses evaluated were bluebunch wheatgrass *(Agropyron spicatum)*, Idaho fescue *(Festuca idahoensis)*, junegrass *(Koeleria cristata)*, squirreltail *(Sitanion hystrix)*, and Thurber needlegrass *(Stipa thurberiana)*. Initial harvest dates were May 15, June 15, August 27, October 12, and November 9.

Each plant subsequently was evaluated at the end of the growing season in 1977 and 1978. Measurements included yield, and each plant was photographed to determine basal area. Since the different species inherently are different in size, yield was expressed as grams per square decimeter (about 16 square inches) of basal area.

RESULTS AND DISCUSSION

Date of harvesting has a substantial effect on basal area when compared to the initial basal area (Figure 1). Plants harvested in May showed almost a 40 percent reduction in basal area when measured in 1977 and this increased to 45 percent by 1978. This reduction was most evident among Idaho fescue and Thurber needlegrass plants. These two species also were primarily responsible for the high reduction in basal area observed at the June harvest date.

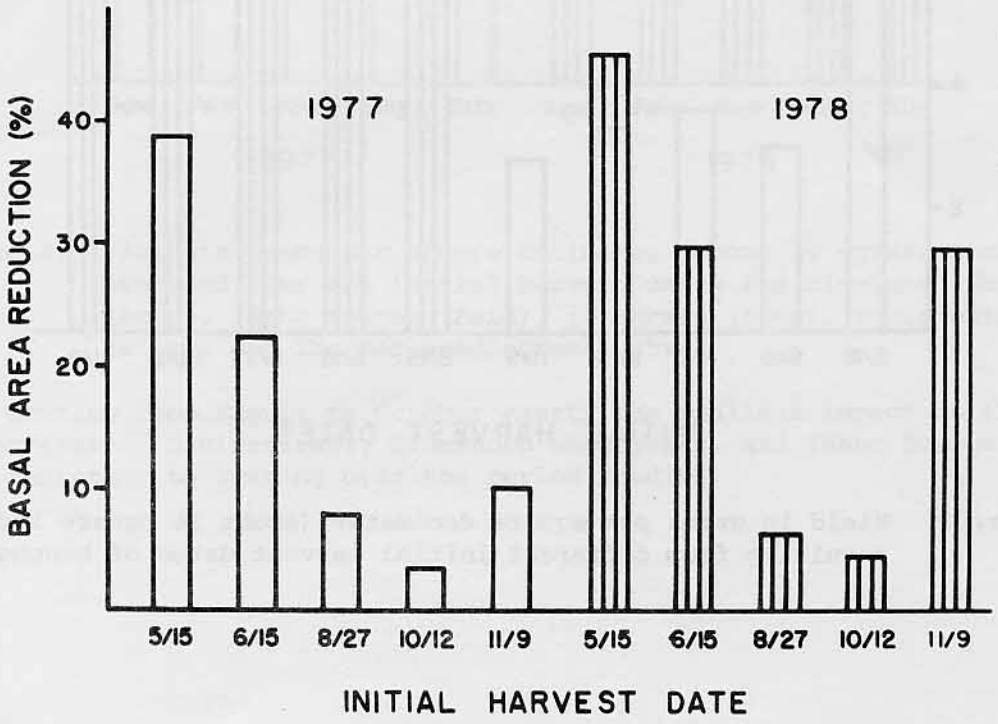

Figure 1. Effect of initial harvest date on percent basal area reduction averaged over five bunchgrass species in eastern Oregon.

Reductions in basal area were small for the August and October treatment dates even though regrowth was evident as a result of early August rainfall. The November harvest date was low in 1977 but when measured in 1978, the reduction had increased to 30 percent. This increase was mostly because of reductions in basal area of Idaho fescue and junegrass.

The 1977 growing season was characterized by drought conditions; only 70 percent of crop year precipitation was received. This appeared to mask the harvest date effects although the August date was higher than most other dates (Figure 2). The yield from plants harvested in May was the highest, but these plants contained some regrowth herbage produced after the initial harvest in 1976. Yield measured in 1978 was at least two-fold higher than 1977 because near normal crop year precipitation was recorded. Plants harvested initially in June were the lowest yielding and October plants were highest. Although the basal area of the May harvest was reduced by about half, the portion that survived was not affected appreciably with respect to ability to produce hergage.

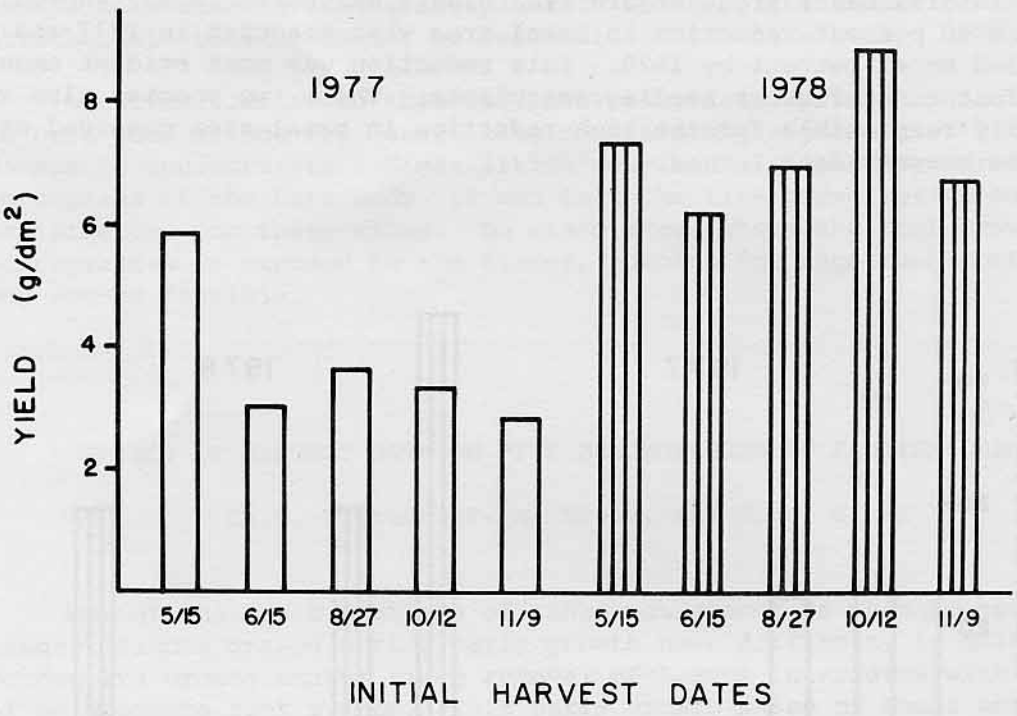

Figure 2. Yield in grams per square decimeter (about 16 square inches) resulting from different initial harvest dates of bunchgrasses.

Similar trends were evident for individual species (Figure 3) in the average over-all harvest. Lower yields were observed for the drought year of 1977 and higher yields in 1978. Bluebunch wheatgrass and Idaho fescue were almost identical in response. Squirreltail was the most productive species per unit basal area although it must be remembered that it is typically a small plant. Thurber needlegrass was the lowest yielding species of all. The combination of low yield and large reduction in basal area makes Thurber needlegrass the least desirable bunchgrass studied.

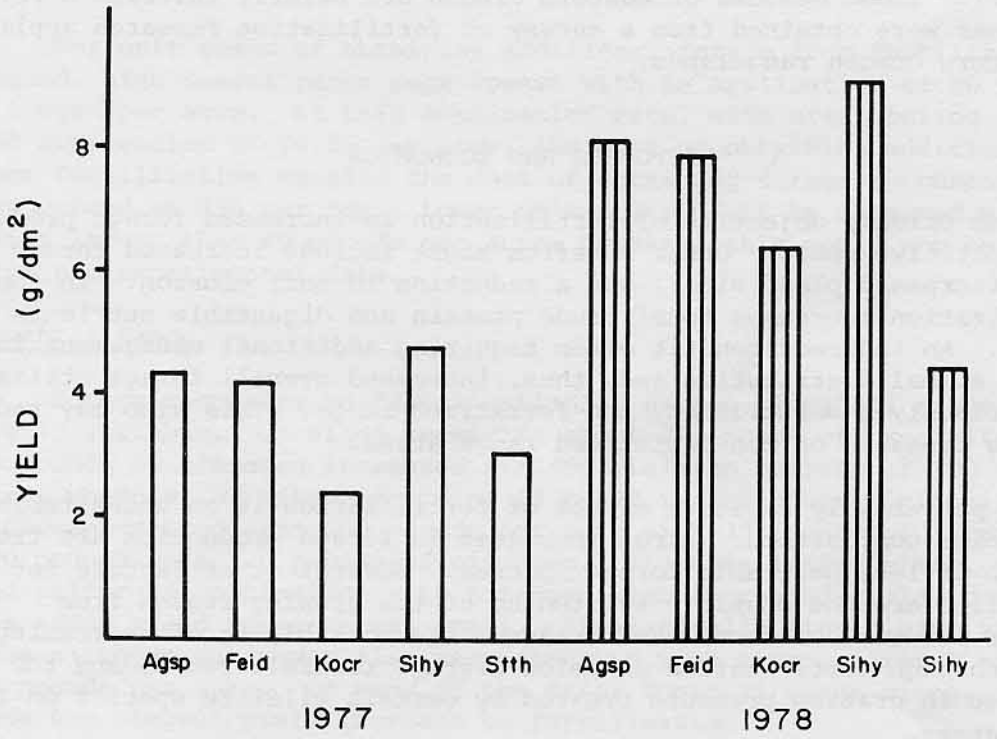

Figure 3. Yield in grams per square decimeter (about 16 square inches) averaged over all initial harvest dates for bluebunch wheatgrass (Agsp), Idaho fescue (Feid), junegrass (Kocr), squirreltail (Sihy), and Thurber needlegrass (Stth)

Grazing from August to October exerts the smallest impact on these bunchgrasses. Squirreltail, bluebunch wheatgrass, and Idaho fescue are most resistant to grazing over the period studied.