Results and Conclusions

As shown by the first and second regressions in Table 1, a single meter reading of the plot estimated weight of total herbaceous material more accurately than it estimated total herbaceous material plus woody stems. The difference between the correlation coefficients was significant at the 95% level. Twenty percent more variation in estimated weight (Y) was accounted for by excluding woody stems. The third and fourth regressions reveal that a single meter reading estimated the weight of shrub leaves and current stems alone more accurately than it estimated shrub leaves and stems plus wood. The correlation coefficients were significantly different. Twenty-seven percent more variation in Y was accounted for by the exclusion of wood. Our experience reveals that higher r² values can be obtained from more homogeneous sample units than from the lumped data we present here.

Excluding wood probably improved the regressions because (1) wood has little capacitance relative to herbaceous material, so that we were combining regressions with grossly different slopes, and (2) the amount of wood on plots varied so greatly (0 to 869 g) relative to herbaceous material (3 to 99 g).

The weight of shrub leaves and current stem growth can be estimated more accurately with a capacitance meter if the effect of forbs and grasses is removed (the sixth regression contrasted with the second in Table 1). If forbs and grasses are sparse and cannot be estimated accurately, however, the effort to take a second meter reading may not be justified.

Our records indicate that clipping and sacking woody stems requires nearly one-third of the unit in winter, one-seventh in spring, and scrub hardwoods and shrubs, primarily blackjack oak (Quercus marilandica Muench.) and slender waxmyrtle (Myrica cerifera L.), had grown too large for effective control by fire. In open areas, dense grass, principally pinehill bluestem (Andropogon divergens [Hack.] Anders. ex Hitchc.) and slender bluestem (A. tener [Nees] Kunth), was interlaced with blackberry briars (Rubus sp.). Exclusion of fire and grazing had allowed an increase of cutover muhly (Muhlenbergia expansa...
A different third of one unit was burned each March 1 (winter). Approximately three-sevenths of the other unit was burned each year—one-seventh in winter (March 1), one-seventh in spring (May 1), and one-seventh in summer (July 1). The first treatment was designated winter burning and the second, seasonal burning.

Brahman crossbred heifers grazed the study units from mid-April through October. Yearlings grazed both units during 1968 and 1970. Stocking rates, which were equal for both study units, were 6.3 acres/animal unit (AU) for yearlings and 6.3 acres/animal unit (AU) for 2-year-olds during 1968 and 1970. Stocking rates, which were equal for both study units, varied from 6 to 18 acres/animal unit during the study. Animals were randomly assigned to study herds and weighed individually at 28-day intervals. Loose salt and steamed bonemeal (10% phosphorus) were provided free-choice, randomly assigned to study herds and weighed individually at 28-day intervals. Loose salt and steamed bonemeal (10% phosphorus) were provided free-choice, randomly assigned to study herds and weighed individually at 28-day intervals.

Results and Discussion

In 1967 the herd on winter-burned range significantly outgained the one on seasonally burned range, but in other years neither significantly outgained the other (Table 1). Stocking rates tended to be highest on the winter-burned range, whereas total gains tended to be highest on the seasonally burned range. Both provided high-quality forage through much of the grazing season. The winter-burning rotation, because of its simplicity and low expense, is recommended for forage management on forested or clearcut native range. Because different thirds are burned in the 2 years following heavy use, the plants had 2 years of light grazing in which to regain vigor. Thus, close grazing accomplished on the winter-burned range what the delayed burns did on seasonally burned range. Both provided high-quality forage through much of the grazing season. The winter-burning rotation, because of its simplicity and low expense, is recommended for forage management on forested or clearcut native range in the longleaf-slash pine timber type.

**Literature Cited**


**Range Term Glossary Committee. 1964. A glossary of terms used in range management. Amer. Soc. Range Manage. 32 p.**


**Highlight:** Seeds of *winterfat* (*Eurotia lanata*) were separated into three size classes and germinated under four temperature regimes. Larger- and medium-size seeds germinated better and faster than small-size seeds.

Larger seeds of a plant species usually produce more vigorous seedlings than smaller seeds (Kittock and Patterson, 1967). With some species—wheat, for example—seedling emergence also has been reported to be higher from larger seeds (Kittock and Law, 1968). Similar results were found with alkali sacaton (Knipe, 1970).

Germination, however, is not always greater from larger seeds. For example, little relationship was found between seed size and viability for mature seed of Hardinggrass (Whalley, et al., 1966). Likewise, size of fourring saltbush seeds had no significant effect on germination provided the seeds contained embryos (Springfield, 1970).

The objective of this study was to determine the effects of size of winterfat (*Eurotia lanata* (Pursh) Moq.) seeds on their germination under four temperature regimes.

Ripe fruits of winterfat were collected in November from a group of plants near Corona, N. Mex. Four months later (when after-ripening was complete), seeds were threshed from the fruits by hand, then separated into three size classes (Table 1).

Treatments consisted of six replications of 50 seeds each under constant temperatures of 45, 51, and 56 F in darkness and under an alternating regime of 76 F (12 hrs light)-60 F (12 hrs dark). Seeds were germinated in petri dishes filled with 100 ml vermiculite and 60 ml distilled water. Two layers of germination blotter were put on the vermiculite. The seeds, dusted with fungicide, were placed on the blotters, which remained moist throughout the experiment.

Germinated seeds were counted daily. Unpublished results of another experiment showed after-ripening of this collection of seeds was complete in 9 weeks.

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**Table 1. Cumulative heifer gains (lb.) on winter and seasonally burned range during 168-day grazing periods. Yearlings grazed in 1967 and 1969, 2-year-olds in 1968 and 1970.**

<table>
<thead>
<tr>
<th>Year and burning treatment</th>
<th>Stocking rate (acres/ AU)</th>
<th>Average initial weight</th>
<th>Average seasonal gain</th>
<th>Average daily gain</th>
<th>Average gain/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967 Winter</td>
<td>6.3</td>
<td>343</td>
<td>138</td>
<td>0.8</td>
<td>31.0</td>
</tr>
<tr>
<td>1967 Seasonal</td>
<td>6.3</td>
<td>359</td>
<td>103</td>
<td>0.6</td>
<td>23.2</td>
</tr>
<tr>
<td>1968 Winter</td>
<td>11.1</td>
<td>454</td>
<td>154</td>
<td>0.9</td>
<td>15.4</td>
</tr>
<tr>
<td>1968 Seasonal</td>
<td>11.1</td>
<td>454</td>
<td>164</td>
<td>1.0</td>
<td>16.4</td>
</tr>
<tr>
<td>1969 Winter</td>
<td>11.4</td>
<td>438</td>
<td>174</td>
<td>1.0</td>
<td>21.8</td>
</tr>
<tr>
<td>1969 Seasonal</td>
<td>11.4</td>
<td>446</td>
<td>186</td>
<td>1.1</td>
<td>23.2</td>
</tr>
<tr>
<td>1970 Winter</td>
<td>17.7</td>
<td>558</td>
<td>259</td>
<td>1.5</td>
<td>16.2</td>
</tr>
<tr>
<td>1970 Seasonal</td>
<td>17.7</td>
<td>555</td>
<td>282</td>
<td>1.7</td>
<td>17.6</td>
</tr>
</tbody>
</table>

1Based on conversion factors of 0.7 animal units (AU) for yearlings and 0.9 for 2-year-olds (Range Term Glossary Committee, 1964).

2Only in 1967 did seasonal gains differ significantly by treatment.