Artemisia vulgaris L.: An Ornamental Plant for Disturbed Land Reclamation

Gerald E. Schuman and Gene S. Howard

Highlight: Mugwort wormwood (Artemisia vulgaris L.), an ornamental sage, shows promise in the reclamation of disturbed lands. Dryland plantings at several mine sites showed excellent survival and growth. Analysis of the plant material showed the average protein content was 31.5% and the average in vitro digestibility, 67%. The low volatile oil content, 0.03%, accounts for its palatability and digestibility as compared with other species of Artemisia.

Authors are soil scientist and horticulturist, respectively, U.S. Department of Agriculture, Science & Education Administration - Federal Research, High Plains Grassland Research Station, Route 1, Box 698, Cheyenne, WY 82001.

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Fig. 1. View of mature Artemisia vulgaris plant and seed stalk.

Mugwort wormwood (Artemisia vulgaris L.), an ornamental sage, is native to Eurasia and was introduced to the eastern United States (Bailey 1930). It is adapted to a wide variety of soils and climatic conditions. Field plantings have been maintained at the High Plains Grassland Research Station, at Cheyenne, Wyo., since 1971. Several selections of this wormwood species have been made for flower and leaf variations to improve its ornamental value. At one time, this sage was used for medicinal purposes (Bailey 1930) and now shows promise in the reclamation of disturbed lands.

Mugwort wormwood is a herbaceous, vigorous, erect, multiple stemmed (to 20 or more) perennial that has branched flower panicles from the upper leaf nodes. Flowers are yellowish, small, numerous, and not showy. Leaves are alternate, gray tomentose beneath, green glabrous above, sometimes entire or pinnately cleft but most often palmately cleft (Fig. 1). Under irrigation, the
Table 1. Nutritional characteristics of *Artemisia vulgaris* at three growth stages.

<table>
<thead>
<tr>
<th>Growth Stage</th>
<th>Protein %</th>
<th>P %</th>
<th>Ca %</th>
<th>Mg %</th>
<th>K %</th>
<th>Na %</th>
<th>Digestibility %</th>
<th>Lignin %</th>
<th>Cellulose %</th>
<th>Ash %</th>
<th>NDF (^1)</th>
<th>ADF (^2)</th>
<th>DM %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preflowering (7-22-76)</td>
<td>31</td>
<td>.55</td>
<td>1.57</td>
<td>.33</td>
<td>4.57</td>
<td>.11</td>
<td>69</td>
<td>7.9</td>
<td>13.4</td>
<td>16.3</td>
<td>27.3</td>
<td>23.8</td>
<td>—</td>
</tr>
<tr>
<td>Maturity (8-30-76)</td>
<td>32</td>
<td>.53</td>
<td>1.41</td>
<td>.31</td>
<td>4.93</td>
<td>.10</td>
<td>66</td>
<td>9.7</td>
<td>19.1</td>
<td>13.2</td>
<td>32.6</td>
<td>30.2</td>
<td>19</td>
</tr>
<tr>
<td>Post-maturity (11-3-76)</td>
<td>12</td>
<td>.28</td>
<td>2.25</td>
<td>.27</td>
<td>2.1</td>
<td>.07</td>
<td>64</td>
<td>8.2</td>
<td>22.2</td>
<td>11.7</td>
<td>34.1</td>
<td>32.7</td>
<td>—</td>
</tr>
</tbody>
</table>

\(^1\) Neutral detergent fiber.
\(^2\) Acid detergent fiber.

Analysis of whole plant material at various stages during the growing season showed the average protein content was 31.5% (Table 1). This is considerably higher than that of range shrubs and forbs (Hamilton and Gilbert 1972). The November samples had a protein content of 12%. The phosphorus content during the growing season averaged 0.54%, which is equal to or above the nutrient requirement for finishing cattle (National Academy of Sciences 1976). The calcium, magnesium, potassium, and sodium content resemble those of other range shrubs and forbs (Hamilton and Gilbert 1972). However, the quality of the plant material is higher than that of the native shrubs and forbs. The average in vitro digestibility of new plant growth is 67%, which equals or exceeds that of many forage species grown for hay. This plant has a volatile oil content of only 0.03%, which accounts for its palatability and digestibility as compared with other species of *Artemisia*. For example, the volatile oil content of *Artemisia tridentata* ranges from 1 to 1.26% (Kinney et al. 1941; Adams and Billinghurst 1927; Adams and Oakberry 1934).

Mugwort wormwood seems to have several characteristics that make it a useful plant for seeding with grasses and other shrubs on disturbed lands in the arid and semiarid areas. It is hardy, adaptable to a wide variety of soils and climatic conditions, and highly nutritious to both domestic livestock and wildlife.

**Results and Discussion**

The dryland plantings of mugwort wormwood had excellent survival (greater than 90%) and growth. The plants were so attractive to antelope, deer, and rabbits that exclosures were needed to grow mature plants. When not protected by exclosures, grazing by wildlife was so heavy that plants seldom were able to grow more than 15 to 20 cm tall. However, even with the close grazing and the severe drought during this period, survival was greater than 90% over the 3-year period. Protected plants were about 1 m tall by the third year.

No seedling emergence was evident from the 1977 spring direct seeding trials at either location, whereas the 1976 fall seeding resulted in an acceptable stand. More research is needed to determine the best time, depth, and method of seeding.

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**Measuring Fireweed Utilization**

EDMUND P. HARSHMAN AND RICHARD FORSMAN

Highlight: Measurement of grazing use on forbs has not received as much attention as grasses. On the Willamette National Forest, forbs are the major forage-producing species on Willamette National Forest clearcut units. Fireweed in particular (*Epilohium angustifolium*) is utilized by sheep, deer and elk. (Ingram 1931; Young et al. 1942) To determine the forage use of this plant by these animals, a study was initiated on the Willamette National Forest to find an efficient and accurate method of measuring fireweed utilization which would provide the means of determining proper use of clearcut units.

Fireweed appears to have a life form very similar to that of a coniferous tree. As the volume and weight can be determined for trees, it seems logical that a method can be developed to measure utilization of fireweed. Also, the Forest Service has done considerable work in the past with utilization curves for sedge and grass.