Growing Alfalfa for Forage

Area of Adaption

Alfalfa (Medicago sativa), or lucerne, is worldwide in its distribution and is grown in many areas of the United States, accounting for nearly 30 million acres of production. A wide range of soil and climatic conditions are suitable for alfalfa, but for best production it requires a well-drained soil with nearly neutral pH and good fertility. Alfalfa can be grown in nearly all areas of Oregon but should not be expected to do well in poorly drained or acid soil or in areas where adequate water is not available.

Primary Use

Alfalfa is used primarily as a hay crop. It has the highest feeding value of all commonly grown hay crops when harvested at late bud or early flower stage of maturity. Alfalfa produces the greatest amount of protein per acre of any livestock feed. It is often used in combination with corn silage in livestock rations to take advantage of the protein and energy content of the two feeds. Alfalfa can also be made into silage, pellets, meal, or cubes. With careful management, alfalfa can be used successfully as a pasture crop.

Varieties

Many varieties of alfalfa are available with specific characteristics for climatic, edaphic, and insect and disease problems. Winter-hardy, moderately hardy, and Flemish-type varieties are available for the different climatic regions of Oregon. Consult your county agent for varieties that will do well in your area.

Establishment

Alfalfa requires a deep, permeable soil with an adequate moisture supply during the growing season for maximum yields. It is very sensitive to poor drainage and compacted soil conditions that restrict root growth. Thus, alfalfa is most productive on loam or loamy soils that are both well drained and have good moisture-holding capacity. Alfalfa does not tolerate acid soils, especially in the seedling stage.

A good seedbed for alfalfa is finely pulverized, leveled, and firmed to the seedling depth and contains soil moisture near the surface to initiate germination. Leveling the field to eliminate dead furrows and low spots will result in a more uniform stand and ease equipment travel for the life of the stand.

The proper time for seeding alfalfa is determined by seasonal temperature and moisture conditions. Spring seeding should be made early enough to allow good root

<table>
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<tr>
<th>Use</th>
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<th>Alfalfa seeding rate</th>
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<tr>
<td>Hay and silage</td>
<td>30-60 or irrigated</td>
<td>12-15</td>
<td>Orchardgrass</td>
<td>5-6</td>
</tr>
<tr>
<td>Hay and silage</td>
<td>30-60</td>
<td>10</td>
<td>Timothy</td>
<td>4</td>
</tr>
<tr>
<td>Pasture</td>
<td>12-40</td>
<td>4</td>
<td>Tall wheatgrass</td>
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systems to form before high temperature and low moisture conditions slow growth rates.
Late summer and fall seedings must be made early and have sufficient soil moisture to allow enough growth to minimize loss of stand from winter injury.
Alfalfa seed must be placed in contact with moist soil. Seedlings are unable to emerge from the soil if planted too deep. For best seedling survival, drill seeds approximately ¾ inch deep. Seedling emergence is greatly reduced when seeds are planted deeper than ¾ inch.
A seeding rate of 12 pounds per acre planted in 6-inch rows is usually sufficient for a good stand of alfalfa. However, higher seeding rates are sometimes used to compensate for poor soil preparation or seeding methods.

Inoculation
The presence of effective nodules on the roots of the plants is essential to a vigorous, productive stand. These nodules are formed by bacteria (Rhizobium meliloti) that are able to fix nitrogen from the air for use by the alfalfa plants. These bacteria may be present in fields where alfalfa has been grown recently, but all strains of bacteria are not equally effective. All alfalfa seed should be inoculated with a fresh commercial inoculum immediately prior to seeding, regardless of cropping history of the land or any previous inoculation of the seed. Inoculated seed should be kept cool and moist until planted.

Fertilization and pH Requirements
A productive alfalfa crop is a heavy user of plant nutrients. A complete fertilizer program is essential to establish a long-lived stand. A soil test is the first step in starting a fertility program. Applications of fertilizer and lime should be based on the results of a soil test. Lime applications are required on soils having a pH below 6.0.
Apply lime well in advance of seeding, mixing thoroughly with the top 6 inches of soil. All applications should be based on the results of a soil test. Lime applications are required on soils having a pH below 6.0.
Phosphorus can be applied by banding 3 to 6 inches to the side of or below the seed, just prior to the seeding operation. Potassium, sulfur, and boron should not be banded near the seed.
Nitrogen fertilizer is not required on a nitrogenous forage because of the fixation of atmospheric nitrogen by effective nodules. Addition of nitrogen fertilizer will reduce the efficiency of ineffective nodules.
Fertilizer recommendations based upon soil test data are provided in OSU Fertilizer Guides 18 and 20.

Management
The timing of the removal of top growth of alfalfa by mowing or grazing has a profound influence on the productivity and length of life of an alfalfa stand. The large taproot of the alfalfa plant is a storage organ for food reserves that are needed to renew top growth in the spring and after each cutting. The maintenance of food reserves is necessary to keep the stand vigorous and productive. The amount of food reserves in alfalfa roots increases as the interval between cuttings is increased to 35 days, after which it declines. Cutting more frequently than 28 days or continuous grazing will lower the root reserve and weaken the stand.

Hay quality
Cutting at the proper stage of growth has a greater influence on hay quality, total production, and life of the stand than any other management decision. The highest quality hay is cut in the early bud stage when the plants have a high proportion of leaves that are rich in protein. As the plants mature, the stems become more coarse and constitute a larger proportion of the total plant, protein percentage decreases, and fiber content increases. However, alfalfa cut at the pre-bud stage produces less than 2 pounds per acre and continues early cutting seriously weakens the stand.
For first cutters, the bloom is often delayed by cool weather and low light intensity. The appearance of new bud growth on the crown (near the soil surface) or the yellowing of lower leaves is usually a better indicator of time to make the first cutting.

Alfalfa for pasture
Early season grazing of alfalfa provides a method of using the first cutting, which is often damaged by spring rains if left to grow into hay. When pastures are grazed, however, the seed must be high enough to avoid crown damage from trampling.
Alfalfa is used for year-round pasture, a rotational grazing system must be provided to allow root reserves to be replenished. A rotation that provides 30 to 35 days of regrowth is adequate. If continuously grazed, plants should be kept between 3 and 6 inches high during the spring and summer and allowed to increase to a height of 6 to 12 inches during the fall. This top growth may be killed following a killing frost without reducing winter survival.

Bloat
Bloat is often a problem for animals on pastured alfalfa. Often, the methods of controlling bloat have been troublesome, expensive, and only partially effective. Using a grass-legume mixture in pastures, supplementing legumes with grass hays, intensive strip grazing with electric fences, and drylot feeding have all been somewhat successful.
The most promising preventative treatment involves the use of bloat-preventative materials. These antifoaming compounds may be added to drinking water, applied as a top dressing on grain supplements, included in pellets, or added to salt-molasses blocks supplied on pasture. However, the effectiveness of these methods is variable and depends upon animals obtaining a regular supply of bloat preventative.

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