



## ALFALFA

### (Western Oregon--West of Cascades)

Alfalfa will produce high yields of forage when grown on deep, well drained soils in western Oregon. The high yielding first cutting is usually made in early May when rain frequently causes heavy losses if the alfalfa is harvested as hay. It is, therefore, desirable to harvest the first cutting as silage.

Top yields of alfalfa remove substantial amounts of mineral nutrients. Field experiments have shown that under different conditions in western Oregon, alfalfa has profitably responded to phosphorus, potassium, sulfur, boron, and lime. The need for nutrients other than sulfur can be determined with a soil test. With borderline test values, retest every year or every other year.

#### INOCULATION

All alfalfa seed should be inoculated immediately before seeding to insure an adequate supply of nitrogen-fixing bacteria. A fresh, effective, live culture of the correct strain of Rhizobia should be used.

Not all nodules on alfalfa roots are effective. This is especially true when the nodulation has been caused by Rhizobia from soil in an old alfalfa field.

#### NITROGEN (N)

A response of alfalfa to applied N indicates that the alfalfa has not been effectively inoculated.

#### PHOSPHORUS (P)

The need for P fertilization can be determined by a soil test.

P can be applied to alfalfa fields most effectively by banding 1/2" to 1" to the side or below the seed when seeding. Some soil should separate seed from fertilizer.

Do not include boron in band applications.

Working P into the surface 2" of soil during seedbed preparation is more effective than broadcasting following seeding.

#### On new seedings:

If OSU soil test for P reads (ppm):	Apply this amount (lb/A) $P_{25} \times 0.44 = P$
0 to 10	100-150 44-66
10 to 20	70-100 31-44
20 to 40	40- 70 18-31
over 40	none

#### On established stands:

If OSU soil test for P reads (ppm):	Apply this amount (lb/A) $P_{25} \times 0.44 = P$
0 to 10	80-100 35-44
10 to 20	50- 80 22-35
20 to 40	30- 50 13-22
over 40	none

The P content of fertilizer is expressed as the oxide ( $P_{25}$ ) on fertilizer labels. Multiply  $P_{25}$  by 0.44 to convert to P.

On established stands the P application should be made in the fall or early spring prior to March 15.

#### POTASSIUM (K)

Alfalfa requires large amounts of K. Available soil K may decline rapidly under established alfalfa stands. Check soil tests every year on soils with borderline values. Retesting is especially important on "Red Hill" soils.

#### On new seedings:

If OSU soil test value for K is below 150 ppm K --

Apply 40 to 60 lbs  $K_2O/A$ .

K should be broadcast and worked into the seedbed prior to seeding.

#### On established stands:

On non-irrigated alfalfa broadcast K in fall or early spring.

On irrigated alfalfa apply one-half of K in fall or early spring and apply other one-half after the first cutting.

FG 18 (Cont.)

If OSU soil test for K reads (ppm):	Apply this amount (lb/A) $K_2O \times 0.83 = K$	
0- 75	150	125
75-150	90-150	75-125
150-200 Hill soils:	90	60
Valley floor soils:	none	
over 200	none	

The K content of fertilizer is expressed as the oxide ( $K_2O$ ) on fertilizer labels. Multiply  $K_2O$  by 0.83 to convert to K.

Whenever K deficiency symptoms become apparent on the alfalfa leaves, at least 90 lbs  $K_2O/A$  should be applied to provide the needs of the following crop.

A K deficiency is indicated by light colored spots around the margins of the leaves.

#### SULFUR (S)

Include 20 to 40 lbs S in fertilizer program each year. Fall or early spring application is satisfactory.

1 ton of alfalfa hay removes about 5 lbs of S.

S is often contained in other fertilizer materials.

#### MAGNESIUM (Mg)

There has been no observed indication of response from applications of Mg to alfalfa in the Willamette Valley. Trial applications are suggested when soil test values are below 0.8 meq Mg/100g or when the amount of calcium is more than ten times the amount of Mg.

#### BORON (B)

If OSU soil test for B reads (ppm):	Apply this amount (lb/A) B
0 to 0.7	4 (initial application) then
	2-3 annually
0.7 to 2.0	2-3
over 2.0	none

B should not be banded close to seed.

B and other materials should be thoroughly mixed when B application is combined with other fertilizers.

B can be toxic if applied at rates higher than recommended.

B should be applied in fall or early spring.

Response to B is most apparent on second or third cutting.

#### LIME

Lime should be applied when the pH of the soil is below 6.0 or the OSU soil test for calcium is below 7 meq Ca/100 g of soil.

Apply lime before seeding and thoroughly mix with the surface 5 to 6 inches of soil.

A lime application is effective over several years.

Broadcasting lime on established alfalfa fields is not an effective practice.

The rate of lime application recommended will vary from 1 1/2 to 4 tons/A depending on the pH and calcium content of the soil and other soil properties.

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P, K, Mg, B, and lime recommendations are based on soil test values from the Soil Testing Laboratory, OSU, Corvallis, Oregon.

Recommendations based on experiments conducted by T. L. Jackson, Oregon Agricultural Experiment Station.

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