



# ALFALFA

## (Western Oregon--West of Cascades)

Alfalfa will produce high yields of forage when grown on deep, well drained soils in western Oregon.

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.

Additional details on legume seed inoculation are described in OSU Fact Sheet 184 "Inoculating Alfalfa and Clover Seed."

### 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 of Phosphate (P <sub>2</sub> O <sub>5</sub> )-(lbs/A):
0 to 10	100-150
10 to 20	70-100
20 to 40	40- 70
over 40	none

#### On established stands:

If OSU soil test for P reads (ppm):	Apply this amount of Phosphate (P <sub>2</sub> O <sub>5</sub> )-(lbs/A):
0 to 10	80-100
10 to 20	50- 80
20 to 40	30- 50
over 40	none

The P content of fertilizer is expressed as the oxide (P<sub>2</sub>O<sub>5</sub>) on fertilizer labels. Multiply P<sub>2</sub>O<sub>5</sub> by 0.44 to convert to P.

On established stands the P application should be made in the fall.

### 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.

If OSU soil test for K reads (ppm):	Apply this amount of Potash (K <sub>2</sub> O) - (lbs/A):
0- 75	150
75-150	90-150
150-200 Hill soils:	90
Valley floor soils:	none
over 200	none

The K content of fertilizer is expressed as the oxide (K<sub>2</sub>O) on fertilizer labels. Multiply K<sub>2</sub>O by 0.83 to convert to K.

#### On new seedings:

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.

Whenever K deficiency symptoms become apparent on the alfalfa leaves, at least 90 lbs K<sub>2</sub>O/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. Responses to K fertilizer are often obtained before leaf deficiency symptoms are apparent.

**SULFUR (S)**

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

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

S is contained in several fertilizer materials used to supply other nutrients.

**MAGNESIUM (Mg)**

Responses to Mg applications have not been measured in alfalfa fertility experiments to date. 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.

Mg can be applied in the form of dolomite lime which is equal to ground limestone in reducing soil acidity.

**BORON (B)**

If OSU soil test for B reads (ppm):	Apply this amount of B (lb/A):
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**

Alfalfa is sensitive to soil acidity and is responsive to liming of acid soils. Lime should be applied when the pH of the soil is below 6.4 or the OSU soil test for calcium is below 5 meq Ca/100g of soil.

If the OSU SMP Buffer test for lime reads: Apply this amount of lime (T/A):

below 5.2	5-7
5.2-5.5	4-5
5.5-6.0	3-4
6.0-6.4	2-3
6.4-6.6	1-2
over 6.6	0

The suggested liming rate is based on 100 score lime.

• Apply lime several weeks 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.

Dolomite lime, which can be used as a source of Mg, is equal to ground limestone in reducing soil acidity.

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

Suggested fertilizer applications based on experiments conducted by T. L. Jackson, Oregon Agricultural Experiment Station.

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