University of Idaho
College of Agriculture

Cooperative Extension Service
Agricultural Experiment Station

Current Information Series No. 447

September 1978

North Idaho Fertilizer Guide

ALFALFA

These fertilizer guidelines have been developed by the University of Idaho and Washington State University based on relationships obtained from soil tests and crop yield response. The fertilizer rates suggested are based on research results and are designed to produce above average yields if other factors are not limiting production. Thus, the fertilizer guide assumes good management.

The suggested fertilizer rates will be accurate for your field provided (1) the soil samples are properly taken and represent the area to be fertilized, and (2) the crop and fertilizer history supplied is complete and accurate. For help in obtaining a proper sample, refer to University of Idaho CIS No. 162, *Soil Sampling*, or confer with your Extension Agricultural Agent.

Alfalfa hay production removes large quantities of nutrients from the soil. Thus adequate fertilizer should be incorporated into the seedbed as it is prepared and additional amounts should be applied periodically over the life of the stand.

NITROGEN (N)

Alfalfa is a legume which generally fixes and supplies its own nitrogen during growth if it is properly nodulated by viable *Rhizobia* inoculum. Efficiency of nitrogen fixation also depends on adequate levels of other nutrients (especially phosphorus and potassium) and non-toxic levels of aluminum and manganese. Excessive soil acidity can also interfere with nitrogen fixation. In new seedings, 20 to 30 pounds of nitrogen per acre will aid in the initial growth while nodules are being formed by the seedling plants.

PHOSPHORUS (P)

In establishing seedlings, phosphorus fertilizer should be incorporated into the seedbed. On established stands, fall or winter applications are preferred. Applications on phosphorus on established stands may be applied in large enough quantities to last for 2 or 3 years.

Phosphorus needs can be effectively determined with the aid of a soil test (Table 1).

Table 1. Phosphorus (P) fertilizer rates based on a soil test.

Soil test* (0-12 inch)	Apply (lb./acre)	
ppm P	P_2O_5	P**
0 to 2	60	26
2 to 4	40	18
4 to 8	20	9
over 8	0	0

*Sodium acetate extractable PO_4-P

**P_2O_5 X 0.44 = P or P X 2.29 = P_2O_5

POTASSIUM (K)

Alfalfa removes large amounts of potassium from the soil. In establishing seedlings, potassium fertilizer should be incorporated into the seedbed. On established stands, fall or winter applications are preferred. Applications of potassium on established stands may be applied in large enough quantities to last for 2 or 3 years.

Potassium needs can effectively be determined with the aid of a soil test (Table 2).

Table 2. Potassium (K) fertilizer needs based on a soil test.

Soil test* (0-12 inch)	Apply (lb./acre)	
ppm K	K_2O	K**
0 to 35	80	65
35 to 75	60	50
75 to 100	40	33
over 100	0	0

*Sodium acetate extractable K

**K_2O X 0.83 = K or K X 1.20 = K_2O

SULFUR (S)

Sulfur is essential for maximum production of alfalfa. Sulfur deficiency appears as a yellowing of the plant early in the growing season and resembles nitrogen deficiency. Yield and quality reductions can result from sulfur deficiency.

A soil testing less than 10 ppm SO_4-S should receive 20 to 30 pounds of sulfur per acre. Sulfur can be applied as gypsum or in conjunction with liquid or dry fertilizer materials which contain sulfur.

MICRONUTRIENTS

Alfalfa grown in northern Idaho will probably respond to boron (B) and molybdenum (Mo).

The need for boron can be determined from a soil test. A soil sample testing less than 0.5 ppm of boron should receive 2 to 3 pounds of boron per acre. Boron should be broadcast and not banded due to its toxicity which could damage the alfalfa. Use of borated gypsum has been shown to be an effective and economical method of applying needed boron and sulfur.

Response to molybdenum is highly variable. No soil test is available for molybdenum. Molybdenum should not be applied unless there is evidence that it is needed, since excess molybdenum in forage is toxic. Response to molybdenum is usually confined to acid soil areas and severly eroded areas. Consult your Extension Agricultural Agent if you have a question on soil level of molybdenum. When molybdenum is needed, apply 1 pound ammonium molybdate per acre.

LIME

On highly acid soils (pH less than 5.5), lime should be applied on a trial basis to determine if an economic response is possible. Legume crops grown on these soils will normally respond to lime.

GENERAL COMMENTS

1. Prepare a good seedbed in establishing new stands. Don't seed too deep. Approximately ½-inch seeding depth is best in typical north Idaho soils.
2. Select the variety best suited for your location. Time of seeding and rate of seeding will depend on the variety and your area.
3. Good insect, weed and disease control will help insure maximum yields.
4. Alfalfa is a good competitor and helps to reduce weed problems. But don't overlook the benefits of proper weed control which can improve forage quality.
5. Maintain a thick, dense stand for maximum tonnage. Cattle grazing will cause stand reduction due to crown damage and disease.
6. For maximum protein yield, harvest the first cutting in pre-bud to bud stage of bloom development, or when new growth starts to appear from the crown. Subsequent cuttings should be taken at approximately ½ bloom stage. The last cutting should be taken early enough to allow about 4 weeks between the cutting and the first severe freeze in the fall (temperatures below 24 degrees F). This freeze usually occurs about mid-October.
7. Cure and remove the hay with as much color and with as many leaves as possible. Prevent bleaching and protect from rain if possible as this reduces quality.

If you have questions regarding the interpretation of this information, please contact your Extension Agricultural Agent.

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