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Idaho
Fertilizer
Guide

Irrigated Alfalfa

The following fertilizer guidelines are based on relationships established between University of Idaho 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 use of good crop management practices.

The suggested fertilizer rates will be accurate for your field provided (1) the soil samples represent the area to be fertilized; and (2) the crop history information supplied is complete and accurate.

NITROGEN (N)

Nitrogen fertilizer is generally not needed for alfalfa. Responses to applied nitrogen usually indicate the alfalfa plant is not effectively nodulated due to lack of proper seed inoculation or an old stand.

When growers plant alfalfa with a companion crop, both crops compete for the nitrogen. Under these conditions rates of nitrogen at 30 to 40 pounds are suggested to hasten and establish alfalfa stands.

PHOSPHORUS (P)

Alfalfa responds well to applied phosphorus. The need for phosphorus fertilization can be determined by a soil test. Phosphorus materials should be broadcast and plowed down or worked into the seed bed prior to planting.

Table 1. Phosphorus fertilizer rates based on soil test.

Soil Test inches soil depth		Apply lb. per acre	
0-9	0-12	P ₂ O ₅	(P)**
Phosphorus (P) ppm*			
0	0	160	70
4	3	120	53
8	7	60	26
over 12	over 10	0	0

* P test is by the NaHCO₃ extractions.

** Phosphorus is expressed as both the oxide and elemental forms:
P₂O₅ x 0.44 = P or P x 2.29 = P₂O₅.

Phosphorus applications on established stands can best be applied in the fall or early spring. Rates of phosphorus relative to soil test levels are given in Table 1. The recommended application is sufficient for 2 year's production.

POTASSIUM (K)

Potassium needs and removal by alfalfa are high. The need for potassium fertilization can be determined by soil test (Table 2).

Table 2. Potassium fertilizer rates based on soil test.

Soil Test inches soil depth		Apply lb. per acre	
0-9	0-12	K ₂ O	(K)**
Potassium (K) ppm*			
0	0	240	200
75	56	160	133
150	112	80	66
over 200	150	0	0

* K test is by the NaHCO₃ extraction.

** Potassium is expressed as both the oxide and elemental forms:
K₂O x 0.83 = K or K x 1.20 = K₂O.

SULFUR (S)

Areas irrigated with Snake River water or any water containing large amounts of SO₄-S should not experience a shortage of sulfur. Mountain valleys and foothill areas receiving higher rainfall and heavy snows and irrigated with low sulfur water are likely areas for sulfur deficiency.

Sulfur demands by legumes such as alfalfa are greater than demands by grasses.

Soils testing less than 8 ppm sulfate sulfur (SO₄-S) in the 0- to 12-inch soil depth receive 40 pounds sulfur per acre. This rate of application should provide adequate sulfur for 2 years of production.

Fertilizer sources of sulfur include gypsum, elemental sulfur and sulfur contained in some nitrogen, phosphorus and potassium materials.

MICRONUTRIENTS

Zinc (Zn) deficiencies on alfalfa have not been observed in Idaho. Crops such as beans, corn, potatoes and onions would normally exhibit zinc deficiency before alfalfa. Zinc applied to any of those crops would have sufficient residual for alfalfa.

BORON (B)

Boron deficiencies occur in a few areas in Idaho. However, they have not been widespread on Idaho alfalfa fields. Alfalfa is sensitive to low soil boron and deficiencies normally occur on acid, gravelly textured soils.

If the soil tests less than 0.25 ppm B, apply 1 to 3 pounds per acre of boron. Do not use higher rates as boron in excessive amounts is toxic to plants.

GENERAL COMMENTS

1. Complete information on cultural practices necessary for alfalfa production are contained in Idaho Current Information Series No. 144, *Producing Maximum Yields of Irrigated Alfalfa Hay*, revised January 1975.
2. Irrigation, weeds and insects can influence the effectiveness of your fertilizer application.
3. Alfalfa fields in Southern Idaho frequently become yellow during growth of the second and third crop. These fields have not responded to applications of fertilizer to correct this temporary yellowing condition.
4. Variety choice should consider length of time the stand is to be maintained, disease and insect resistance, regrowth rate and winterhardiness. If stands are to be maintained more than 2 years, special effort should be made to use wilt resistant winterhardy varieties.
5. Alfalfa can become a cash crop in the rotation by the application of needed management inputs such as water, fertilizer and pesticides and by timely harvesting.
6. Phosphorus is very important for animal nutrition and can greatly influence animal performance and animal health. Alfalfa hay should be analyzed to determine P content. Fertilization can increase P content of forage.

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