



TECH BULLETIN

Alfalfa Fertilization

5/27/03

Those who are involved with alfalfa production know just how much of a gluten alfalfa is when it comes to removal of soil nutrients. Each ton of alfalfa dry matter removes about 14 lbs. P₂O₅ and 58 lbs. K₂O, table 1. This equates to around 30 lbs. /acre 18-46-0 and 100 lbs. /acre 0-0-60 fertilizer per ton of dry matter removed.

Nutrient	Lbs./Ton Removed	Nutrient	Lbs./Ton Removed
Phosphorus (P ₂ O)	14	Boron	0.08
Potassium (K ₂ O)	58	Manganese	0.12
Calcium	30	Iron	0.33
Magnesium	6	Zinc	0.05
Sulfur	6	Copper	0./01
		Molybdenum	0.002

Alfalfa production utilizes some of all 17 known required crop nutrients; however, phosphorus, potassium, sulfur and boron are the nutrients most often found to be yield limiting. Calcium and magnesium are also very important, but these are usually in adequate supply as long as the soil pH is maintained in or around 6.8-7.2 with dolomitic lime sources.

Alfalfa fertilization is best accomplished at two times of the year, right after the 1st cutting and again after cutting in the fall.

Shown below are Iowa State University's most recent alfalfa P and K recommendations (based on a 5 ton/acre yield):

ISU Soil Test P Interpretation For Alfalfa (5 tons/a)

ISU Soil Test K Interpretation For Alfalfa (5 ton/a)

	Phosphorus Soil Test (ppm)				
	V. Low	Low	Opt.	High	V. High
Mehlich-3 (ICP)					
All Subsoil P Levels	0-20	21-30	31-40	41-50	51+
Bray 1 or Mehlich-3 (Colorimetric)					
All Subsoil P Levels	0-15	16-20	21-25	26-30	31+
Olsen P					
All Subsoil P Levels	0-10	11-14	15-17	18-20	21+
P₂O₅ to apply (lbs./a)					
	110	80	60	0	0

	Potassium Soil Test (ppm)				
	V. Low	Low	Opt.	High	V. High
Ammonium Acetate/Mehlich-3					
Low Subsoil K	0-90	91-130	131-170	171-200	201+
High Subsoil K	0-70	71-110	111-150	151-180	181+
K₂O to apply (lbs./a)					
All Soil Textures	280	240	200	0	0

Sulfur and boron may also be limiting, especially on low organic matter soils. Consider using **Origin Sulfur 90** at around 10-25 lbs./a and/or **Origin Boron 15%** around 3-13 lbs./a. The University of Wisconsin generally recommends the application of 1-2 lbs. actual Boron per acre where soil tests are low to very low. The use of a tissue test to verify micronutrient deficiencies may be helpful.

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