10-1984

Fertilizing Alfalfa for Optimum Yields

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12-3-84

COOPERATIVE EXTENSION SERVICE

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Soil Science News & Views

Vol. 5, No. 10 October 1984

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Alfalfa is one of the most important forage crops in Kentucky. It is grown on a wide range of soil types, has the ability to produce high yields, and will respond to good management including a sound soil fertility program.

Establishment

A soil test should be taken at least 6 months before a new field is to be seeded. If lime is required, the field should be limed to a soil pH of 6.8 at least 4-6 months ahead of seeding in order to give the lime sufficient time to correct any pH problem.

Apply recommended rates of phosphate and potassium as these two nutrients are very important in stand establishment and maintenance. For all seedings, apply 1.5-2 lbs of elemental boron per acre as either a borated fertilizer or as a fertilizer borate material. All fertilizer materials should be applied and incorporated into the soil before seeding. Do not mix seed with fertilizer as this will kill the inoculant bacteria on the seed.

Use a fresh source of recommended inoculant and a sticking agent to properly inoculate seed. Alfalfa can satisfy its nitrogen needs with well nodulated roots resulting from good inoculation procedures.

Stand Maintenance

Adequate soil fertility will contribute to the longevity of vigorous alfalfa stands. After the establishment year, annual applications of phosphate, potash and boron should be applied. It is preferred that these materials be applied in the fall about 1 month before the expected freeze-down for winter dormancy. In Kentucky, the fertilizer can be applied following the late August to early September cutting.

Alfalfa fields should be soil sampled every 2-3 years in order to monitor soil pH, P, and K that will determine annual topdressing rates. Since alfalfa removes large quantities of phosphate and potash (approximately 13 lbs of P_2O_5 and 55 lbs of K_2O per ton per acre per year), it is important to monitor soil test levels so that soil fertility can be maintained at recommended levels. Also, frequent sampling allows producers to adjust their fertilizer and lime applications to avoid either nutrient deficiencies or over-application of nutrients. When yields of alfalfa exceed 4 tons per acre per year in a field, the University of Kentucky recommends an additional 30 lbs of phosphate and 60 lbs of potash per acre for each additional ton of hay above 4 tons per acre. The table below suggests rates for yield levels of 4, 6, and 8 tons per acre based on soil test.

Annual phosphate and potash application for alfalfa (lbs/acre)

Soil Test		Alfalfa yield level (ton/acre)					
P	K	4		6		8	
(lbs/acre)		P_2O_5	K_2O	P_2O_5	K_2O	P_2O_5	K_2O
0-30	0-165	60-120	160-240	120-180	280-360	180-240	400-480
31-60	166-250	0-60	0-160	0-120	120-280	0-180	240-400
61+	250-375	0	0	0	0-120	0	0-240

The recommended amount of boron should be applied annually and soil pH should be maintained in a range of 6.5-7.0.

Molybdenum

Research at UK has indicated that alfalfa stands following new seedings and yields of established fields can be increased with an application of 1.5 to 3.0 ounces of actual molybdenum per acre. If soil pH values at seeding are below 6.2 and the recommended lime was not applied 4-6 months before seeding, a broadcast molybdenum application is recommended. With established stands at a soil pH below 6.2, broadcast (30-40 gallons of spray) the molybdenum in late winter or early spring before new shoots reach 2 inches in height. This is necessary to avoid reaching molybdenum toxicity in the harvested product for the consuming livestock. Also, keep in mind that molybdenum is not a substitute for a good liming program.

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