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From Scientific Staff of the
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QUALITY ALFALFA REQUIRES GOOD FERTILITY

Alfalfa remains one of the country's major forage crops, despite having a rough go of it in recent years. In 2012, harvested area of alfalfa hay fell to about 17.3 million acres, the lowest since 1942 according to government statistics. The effects of drought and high grain prices were mostly to blame. But since then harvested area has clicked up by almost a million acres (NASS Quick Stats, Oct. 2014).

There are many factors that affect alfalfa yield and quality, whether it is for hay, silage or pasture. Some of these factors, like rainfall and temperature, are uncontrollable; however, other factors are to some degree controllable, and can be carefully managed. For example, alfalfa is relatively sensitive to soil acidity, and does best in soil pH range of 6.5 to 7.5. The bacteria that fix atmospheric nitrogen for alfalfa do best in this soil pH range. Soil acidity issues can be corrected with liming, and should be addressed before planting. Crop nutrition and the provision for an adequate supply of nutrients is another of the controllable and critical factors in the production of quality alfalfa.

In most areas alfalfa begins growth in the early spring and continues into the late fall, resulting in a continuous nutrient demand on the soil for several months. While the figures can be quite variable, data published in IPNI's 4R Plant Nutrition Manual indicates that alfalfa hay removes about 51 lb N, 12 lb P_2O_5, 49 lb K_2O, and 5 lb of S per ton of production. Rhizobium bacteria on well-nodulated alfalfa can fix enough nitrogen (N) to meet crop needs, although a newly planted crop may require some N fertilizer (15 to 20 lb N/A) until nodulation occurs. On the other hand, soil supplies of phosphorus (P), potassium (K), and other nutrients can be rapidly depleted from alfalfa fields if not replaced by fertilization.

Phosphorus performs several vital functions in alfalfa plants. It can impact stand establishment by encouraging root growth, and adequate P has been shown to support higher nodule numbers and nodule health essential for protein production. Plant regrowth and recovery after cutting is more rapid with adequate P, compared with deficient P conditions. It is well known that movement of P in soils is limited, so it's usually recommended to apply as much of the crop's anticipated need as reasonable through preplant incorporated application.

Alfalfa takes up and removes large amounts of potassium, in fact more is removed by alfalfa than any other soil nutrient. Alfalfa forage may contain 2 to 3% K. Potassium has many critical roles in plant growth and development. It has long been recognized as a factor affecting disease incidence, and has an important role in enhancing nitrogen fixation. Adequate K also helps to improve stand persistence and winter survival.

Sulfur (S) deficiency in alfalfa results in reduced yield, crude protein content, and feed value. It is most likely to occur in high rainfall areas, sandy soils, and under irrigation where the concentration of dissolved S in irrigation water is low. Input of other nutrients such as zinc and boron may be needed in some cases.

Alfalfa provides excellent forage, and stands can remain productive for years with proper care and nutrition. When considering fertilizer inputs remember that not all yield and quality compromising deficiencies are visible to the naked eye. To help make the best fertilization decisions for specific circumstances use tools such as soil testing, plant analyses, local information, and nutrient input and removal history.

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