GRANUBOR®

Boron Deficiency in Alfalfa

Boron has been shown to increase yields and improve the quality of a wide variety of crops. Alfalfa, a common pasture crop, responds especially well to boron fertilizers.

Boron is an essential nutrient for all plants. Providing alfalfa with adequate boron is necessary for:

- Greener, leafier plants with high protein.
- Faster regrowth after each cutting.
- Longer stand life.
- Improved winter hardiness.
- Enhanced root growth.
- Better water use, efficiency, and drought tolerance.
- Increased root nodule development for fixing nitrogen.
- Thicker stands to suppress weed and grass growth.

Boron deficiency in alfalfa, in its mildest form, can easily pass unrecognized for it appears as a reduction in flowering and seed set. Such a mild boron deficiency is seldom detectable in hay yields from a single cutting. However, reduced flowering may delay cutting, and the result is a poorer quality hay. Eventually, the total quantity of this pasture crop may be reduced.

The main symptoms of boron deficiency are yellowing and reddening of the upper leaves. As the deficiency develops, the top stems progressively shorten and the short side branches give the plant a "rosetted" appearance. At this stage, the growing point becomes dormant or dies.

Boron deficiency is closely associated with moisture stress and drought. Alfalfa yellowing caused by boron deficiency is frequently mistaken for drought damage. Flowering is often reduced and the flowers fall before setting seed. Boron deficiency symptoms look different than leaf hopper injury, potassium deficiency, and certain diseases, all of which cause yellowing of both the lower and upper leaves. With boron deficiency, the yellowing is confined to the upper leaves; it does not occur randomly, as is the case with leaf hopper injury.

Spotting Boron Deficiency in Alfalfa

Yellowing and reddening of alfalfa leaves, resembling drought symptoms, can be a sign of too little boron.

How Much Boron is Enough?

Use these guidelines:

- Alfalfa removes higher amounts of boron from the soil each year than any other crop.
- Most universities recommend applying boron fertilizers at stand establishment, and annually thereafter, after each cutting.
- Rates of boron fertilization should be based on yield goals, along with soil tests and/or plant analyses.
- Table 1 provides general application rates for boron fertilizers.

Timing Your Boron Application

At establishment:

- Boron can be applied and incorporated with other fertilizers and/or chemicals prior toplanting in the fall or spring.
- Broadcast applications are more economical with Granubor® in dry blends, or Solubor® in foliar applications.
- Where leaching or companion crop tolerance are of concern, higher recommended rates of boron should be split, with the majority applied after the first cutting in the establishment year.
- Never apply boron with the seed at planting.

Fertilization of Alfalfa

Tabel 1. Recommended lbs of boron per acre per year:

Potential Yield (tons/acre)	Application method	Boron soil test		
		Low	Medium	High
1 to 3	Prior to seeding	1	0	0
	Topdress	1	1	0
3 to 6	Prior to seeding	2	1.5	0
	Topdress	2.5	2	1
Plus 6	Prior to seeding	3	2.5	1
	Topdress	4	3	1.5

Annual Topdressing

Use these guidelines:

- Alfalfa needs a relatively high rate of boron constantly over the entire growing season.
- Annual boron applications should be applied when other nutrients are top dressed, after cuttings.
- If no other fertilizer is applied due to manuring, boron needs of alfalfa can be met with Solubor® sprayed on the stubble after any cutting, or in any spray operation.
- Foliar sprays should not exceed 0.5 lbs/acre of boron per application.
- Because alfalfa will take up more boron than it needs for a single cutting, split applications of high rates are more economical and efficient.
- Since boron availability is reduced during dry periods, and because adequate boron improves winter hardiness, most growers apply boron after the first cut in the spring and the last cut of summer.

If you would like more information or have questions, contact your local NexusBioAg Representative or visit nexusbioag.com

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