Satisfying the Boron Requirement in Alfalfa

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Boron is an essential micronutrient. Plants simply don't grow without it. Alfalfa has a well documented high requirement for boron in relationship to other crops. Both the vegetative and the reproductive growth phases of alfalfa require boron. Alfalfa plants with adequate boron for normal vegetative growth have been shown to respond to added boron during the reproductive phase.

Boron is a highly leachable micronutrient. It will move where the water moves. Over watering can quickly remove boron from the root zone of the plant. Boron, like all nutrients, is taken up by the plant as they absorb soil moisture and move it through the plant in the xylem system. Drought induced boron deficiency is very common. Boron deficiency can also be induced by liming. Lime ties up the boron in the short term and makes it less available to the plant. The first symptom of boron deficiency is limited root growth.

Just like nitrogen, you can't manage boron if you can't manage the irrigation water. Accidental over applications of boron (boron put on at nitrogen rates) have been leached out of the soil profile in a single season. This indicates how leachable boron is in light soils with low organic matter.

Hidden hunger (yield reduction without foliar symptoms) is well documented with boron in many crops.

Critical soil test levels of boron vary widely for alfalfa in the literature from 0.35 ppm to 1.0 ppm boron in the soil. Dr. Vincent Haby in recent studies in Texas showed that yields were still climbing with soil test at 0.75 ppm. Since an adequate and constant supply of boron is essential to high yielding alfalfa maintaining boron soil test values at around 1.0 ppm is a good guideline. A soil test of 1.0 ppm at crop establishment does not guarantee that you will have adequate boron 3 or 4 years later. Soil testing is important to fertility management particularly boron.

Varietal differences in response to boron are documented in many crops. These responses can be large. Fifteen fold differences for example have been documented between tomato varieties. Alfalfa varietal differences have not been adequately studied..
Since too much boron is a waste of resources and since it leaches it is recommended that smaller application rates applied more frequently are superior a single large application made at crop establishment.