Forage Fact # 8

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Sulphur - Important for Animal & Plant Health

Sulphur's importance:

* role in plant hardiness
* interacts with nitrogen and nitrogen fixation
* increases rumen microbial activity & cellulose digestion
* increase in milk, meat & wool production
* component of some vitamins, amino acids & proteins
* gives proteins their characteristic shape

Why do we need sulphur?

Soil nutrients, such as sulphur, play a vital role in plant growth and animal health. If your field suffers from low yields or health, this could be reflected in your feed quality and in turn your animals' health and condition. There are many nutrients within your soil that your plants and/or animals are dependent on for healthy vigorous lives.

Sulphur is essential to how a plant grows. It is a major component of some protein enzymes that regulate important activities, such as photosynthesis and nitrogen fixation. Sulphur is believed to give proteins their 3 D shape that enables them to carry out their reactions.

Sulphur is important for healthy hay crops. It plays a role in the nitrogen fixation associated with legume crops. It's presence is associated with better nitrogen availability. It is believed to play a role in crop hardiness and winter survival.

Sulphur was applied alone and with other nutrients at Clarkes' forage nutrient management plot by Agricore, FSJ.

Sulphur is also important to animals and humans. It is a major component of certain amino acids: a lack of these in the diet would cause human malnutrition. Sulphur plays a role in most animal body functions. Its presence in forage leads to:

* increase in microbial activity in rumen of cattle and sheep,
* increase in milk, meat and wool production,
* increase in cellulose digestion.

How are deficiencies detected?

To determine if your soil is deficient in any important nutrients like sulphur, you will need to sample your soils. Plant indicator such as poor growth or plant health can be used; but to definitively determine what is causing the poor plant health, samples are necessary.

Plants deficient in sulphur tend to grow slowly and become spindly. Similar to a nitrogen deficiency, plants low in sulphur become light green or yellow. Unlike nitrogen, sulphur does not move through the plant. This means that younger leaves will display more severe symptoms. Some plants will show faint stripes on the leaves. They will have low sugar and high nitrogen in their sap. Since sulphur has a strong interaction with nitrogen, high nitrogen levels can increase the severity of sulphur deficiency.

For more information call :

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Crop removal of sulphur by different crops:

(in lbs/ac)

* alfalfa	20
* barley grain	6.5
* barley straw	5
* oats grain	4
* oats straw	7.5
* wheat grain	4
* wheat straw	6.5

"I was impressed by how visible the differences were in my plots in the first year. And we have another 2 years to see what happens."

Chuck Sutherland

Lee Bowd taking a feed quality sample from Sutherlands' bales of feed oats.

Correcting a deficiency

Sulphur does not move through the soil easily. For this reason, it must be placed in the soil where it can be accessed by the roots. Commercial sulphur fertilizers are available in a variety of forms. While plants can only use the sulphate form of sulphur (SO_4-S), new fertilizers in unoxidized and elemental forms are available at a lower cost per unit than sulphate fertilizers. However, biological efficiency must be weighed against cost when choosing a sulphur fertilizer.

Spreading SulFer 95 with a floater truck by Agro-Source at Double M Ranch near Dawson Creek.

Crop requirements for sulphur

Legume crops such as alfalfa, have a higher requirement for sulphur than grass or cereal crops. The side bar at the left provides more detail.

Can there be too much sulphur?

Sulphur has been associated with certain environmental problems including soil and water pollution. Soil tests provide a guide for appropriate rates to apply.

Forage members experiences with sulphur

Currently the PRFA of BC is involved in several nutrient management demonstrations, where sulphur is one of the variables that we are manipulating. Some preliminary results and observations are worth sharing.

A color difference, between **Brian Clarke's** hay crop that received sulphur and the area that did not, could be seen from an airplane this summer. Although yields did not necessarily increase compared to the control the quality of the feed harvested did. For dairy farmers such as the Clarkes, quality is very important. Brian is willing to pay for an increase in the protein level in the feed.

At **Chuck Sutherland's,** where sulphur was applied on feed oats crop, there were clear differences in leaf color, leaf disease and plant density. Feed quality improvement was more subdued at this site; there are two possible explanations.

The association is using the SulFer 95 products in the trials, which have a higher concentration of sulphur, but are released more slowly than other sulphate fertilizers. This delay in release may lead to a longer time frame before benefits are realized. The second reason for the results at Sutherlands is that the response to sulphur may be masked by the adaptability of the oat plant.

Bob Tubb sums it up. He was quoted at recent forage meetings, saying that "Soil is like a bank and in order for one to continue to withdraw from it, deposits must be made." He was making the point that fertilizers or manures should be used if one wishes to continue to reap benefits from the soil. Without some kind of inputs, whether organic or chemical, hay and silage yields and quality will eventually decline, because the resources that the plant requires will simply not be there.

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