

The following blogs were written by Dan Davidson with dtn from the Plant Psychology 301 December 16th-18th 2009

Blame it on RR and Rup

I am attending a plant nutrition meeting at the Amana colonies in eastern Iowa sponsored by BRT Ag & Turf out of Ladora, Iowa,

Don Huber, plant pathologist and professor emeritus spent Wednesday talking about the Roundup Ready (RR) gene and glyphosate (Roundup or Rup). He has known for some time both the RR gene and glyphosate affect crop production.

He showed results that soybean varieties with the RR gene yield less than varieties without the gene when glyphosate isn't applied. He never suggested a mode of action for this drag.

He also said that glyphosate is a strong chelator and chelates micronutrients like manganese, zinc, iron and copper and manganese is the most sensitive. Glyphosate chelates these micronutrients making them unavailable to the plant for as much as two weeks until the glyphosate begins to degrade and disappear.

He also said that glyphosate accumulates at meristematic regions of the plant and roots tips and affects growth. And lastly glyphosate leaks out of the roots into the soil and has a negative effect on soil organisms.

Because of the RR gene and routine use of glyphosate plants are nutritionally weak and more vulnerable to a host of diseases.

While I knew glyphosate could induce a manganese deficiency I was not aware of all these other potential problems.

I intend to digest all this information and explain more fully in a story the potential woes of using glyphosate. However Huber said it is not all bad because growers can still manage these potential problems with bandages such as foliar fertilizer, fungicides and insecticides.

Chasing 100 bu Beans

At the plant nutrition meeting I attended at the Amana colonies sponsored by BRT Ag & Turf out of Ladora, Iowa, Dr. Dan Skow, veterinarian and partner in International Ag Labs in Fairmont, Minn. spoke on what it would take to produce 100 bu beans on a consistent basis.

Skow told the audience of growers to first change their mindset, to find a coach to guide you through the process.

Second is to select the right seed. He recommends growing your own seed and paying the tech fee and foliar feed the seed crop. "The energy going in that seed will make a difference next year." He also suggests running the seed over a gravity bed to separate light and heavy seed. "You can ditch 90% and keep the other 10% and gain a 3 bu increase. And then do a cold germ test and plant accordingly. Better the cold germ, earlier you can plant it.

In the fall Skow recommends checking for compaction, completing soil tests, adding sulfur and lime or gypsum and treating residue.

For residue management he acknowledges that some growers will no-till beans while other will min-till beans into cornstalks and that depends on the grower, soil and location. However he advocates spraying on a humic and biological product to stimulate decomposition because it will make all the difference next spring when planting and recycling nutrients.

Calcium is king said Skow. "It is the first line of defense against diseases and beans need calcium and sulfur." There are number of gypsum and lime products and by-products available or even calcium nitrate works.

Sulfate can come from a number of sources including gypsum (calcium sulfate) potassium sulfate, ammonium sulfate, K-Mag or elemental sulfur. However he discourages use of elemental sulfur because it is slow to break down and covert to sulfate.

Regarding phosphate and potash don't short it and manures or commercial sources are adequate. He is also a believer in applying additional nitrogen and making 2 to 4 passes with a formulated foliar mix.

Scout for diseases and weeds. And for weeds, well one is too many and if planting Roundup Ready beans to apply manganese as a foliar.

Lastly walk frequently and monitor your fields. Watch for changes and learn to

recognize and healthy and unhealthy crop.

I would like to chase 100 bu beans but doubt it's possible in dryland Nebraska. However I would be satisfied with 70 to 80 bu yields. So I might take him up on his suggestion, use one of their consultants to design a project and designate 30 acres for this project in 2009. Probably should have decided to do this earlier to get a jumpstart on sampling and fall application, but the corn never got harvested until after December 1.

Posted at 10:25AM CST Dec 18, 2009 by Dan Davidson

Don't Forget Sulfur

At the plant nutrition meeting I attended at the Amana colonies sponsored by BRT Ag & Turf out of Ladora, Iowa, Dr. Michael McNeill with Ag Advisory Ltd. in Algona, Iowa spoke on the importance of sulfur.

He told the audience of farmers that sulfur plays many roles and it is increasingly be recognized that sulfur fertilizer is as important as nitrogen, phosphorus and potassium.

McNeill cautioned growers that when drying soils for lab analysis, this increases mineralization of S that misleads us to believe there is plenty available when that is not necessarily the case.

Sulfur plays many roles in crop production explained McNeill. He added that universities have been slow to catch on about the value of sulfur but are beginning to do so.

In the plant it is necessary for protein synthesis and is found in a number of amino acids. It influences nitrogen fixation in legumes and has a physiological role in disease resistance. McNeill said it helps stave off stalk rot that plugs vascular tissues and reduces water and nutrient transport. It also helps plants stay green longer.

McNeill said it also hastens natural maturity drydown. "My own anecdotal observations show that sulfur deficiency slows maturity and delays drydown. Corn will be 3 to 5 points drier at harvest. This is a very consistent response."

Sulfur is also good for the soil. The soil microbes that create a healthy soil need sulfur just like plants. McNeill said residue decomposition requires nitrogen, sulfur and microbes. He suggests a fall application of 75 to 85 lbs per acre ammonium sulfate or 4 to 5 gallons per acre ammonia thiosulfate. Sulfur will stimulate

microbial activity in the soil and helps out with soil aggregation which helps combat compaction, reduces crusting and improves water infiltration.

Sulfur deficiencies can be seen but they have to be confirmed by a tissue test. Principal symptoms include uneven height, chlorosis, stunting and spindly plants. Chlorosis is characterized by a yellowing of the younger leaves on the corn plant, showing up as interveinal chlorosis of the leaves emerging from the whorl. However be aware that other nutrient deficiencies show similar patterns.

McNeill said sulfur is mobile in the soil, much like nitrate so growers need to be aware of potential losses. "The greatest losses occur when potassium and sodium (monovalent cations) predominate. And next greatest is when calcium and magnesium (divalent cations) are plentiful."

In the past sulfur was normally plentiful in the soil except in sandy or low organic matter soils. However with the cleaner atmosphere, there is much left sulfur deposition and supplement sulfur is a good idea.

McNeill also pointed out that the switch to reduce tillage also played a role in shortages. "While reduced and no-till is good for the soil, more residue is left on top of the soil and that does little for soil microbial activity."

Sources of sulfur include animal manures, gypsum products and commercial fertilizer products such as ammonium sulfate, ammonium thiosulfate, potassium sulfate, zinc sulfate, and elemental sulfur. However McNeill pointed out that elemental sulfur is slow to oxidize and convert to the plant available sulfate ion.

McNeill did not make recommendations on how much sulfur to apply to a corn and soybean crop. However he pointed out that corn requires about 30 lbs and soybeans require 25 lbs of sulfur - so that is something to keep in mind.