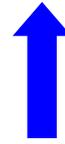


From the Ground Up



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Soybean Vein Necrosis Virus

A relatively new disease has been found in many soybean fields this summer across the Midwest and Plains States. It is called Soybean Vein Necrosis Virus. (See picture to the right) This virus was first identified in Tennessee in 2008. Since then each year it has been found more wide spread. This year it was reported as far north as Ontario, Canada and as far west as Missouri and Iowa. It initially begins as a yellow or light green area between and near the veins. The veins appear translucent which has been referred to as vein clearing. As the disease develops these areas begin to turn reddish brown. In some cases these areas will enlarge encompassing much of the leaf.



Not a great deal is known about this virus, but there is a difference in susceptibility between varieties. It is transmitted by thrips and there may be some weed species that serve as alternate hosts. The precise life cycle of this disease is not known at this time. Severity of this disease will depend particularly on the susceptibility of individual varieties and also the presence of other viral diseases such as soybean mosaic virus or soybean pod mottle virus. Right now the best management practices are selection of varieties that have good resistance to other viral diseases and possibly insect control programs that would help control thrip populations.

Gypsum and Lime Don't Fight Each Other

A comment I have heard from some crop advisors is that lime and gypsum are antagonistic and will fight each other. This is just not true!! I have also heard that gypsum is only for high pH soils and lime is for low pH soils. This is also false!! Although it is true that lime is useful in raising pH and is used mostly in acid soils, gypsum can be and is used in low pH, neutral pH and high pH soils. Gypsum is more soluble than lime and is a good source of calcium in low pH soils. In fact, it is very effective in reducing aluminum toxicity and calcium deficiency in low pH sub-soils where lime cannot reach due to its immobility. It will not reduce the effectiveness of

lime, but rather it will enhance the activity of lime by improving the water movement through the soil and reduce runoff which could remove the lime from the field by erosion. Some people think that since gypsum contains sulfur that it will cause the soil pH to drop, but gypsum is a neutral product because it also contains calcium. The only time gypsum will cause the pH to decrease is if the pH is high (> 7.9) and the soil contains sodium and bicarbonates. A drop in pH in these soils is desired and will reflect an improvement in the soil condition.

Gypsum benefits are numerous, but it is applied most often for improving soil structure, increasing soil infiltration and drainage, enhancing microbial activity, and improving nutrient availability. Lime is used to neutralize acidity and increase pH in soils. In some soils (especially higher silt content), the addition of lime to the soil surface will cause the soils to cement or cause a surface seal. The application of gypsum to these soils with the lime keeps this surface seal from forming and improves the response from the lime application by improving water infiltration movement through the soil. Essentially lime and gypsum complement each other and can be applied together.

Compliments are Appreciated

We all appreciate receiving a positive word about the job we are doing whether it come from a spouse, a fellow worker, an employer or just a friend. When compliments come from customers it is really appreciated. This week while I was visiting with a customer of ours he paid our company a very favorable comment about the work we have done. He told me that he grew up on this farm and had fought the alkali (sodium affected) soils all of his life (about 60 years old). We applied PRO CAL 40 to his farm the first time in 2003 and have re-treated it twice since then. He told me that before the first application there were large areas that wouldn't grow anything. Today the yields in those areas are over 140 bushels per acre and continue to get better each year and with each successive application. He told me he was so appreciative that PRO CAL 40 is available and that we do a very professional job in applying it to the fields. We really do appreciate these comments. Soil Solutions take great pride in knowing that we are improving the productivity of our customers' soils and that this is one of the jobs that God has placed us here to do. This is just one of many positive stories that we receive and we do appreciate all of our customers and the opportunity to serve you and our Maker.

High Nitrates in Your Soils?

Following a drought as we have had in most of our area this year could mean that the soils could have a significant nitrate carryover for next year's crop. A nitrate soil sample to determine the amount should be taken to a depth of 24 inches.

The most common reasons given for high nitrates in soils are that the crop didn't remove as much due to the stressful conditions and the nitrates didn't leach due to the lack of rainfall. Also if nitrates were present at deeper depths, the evaporation from the soil surface may have caused nitrates to actually move upwards in the soil profile. These scenarios may give reasonable explanations for most soils. However, what about the

fields that were irrigated and raised high yields this year and still have very high nitrate levels? If your fields have good organic matter levels or have had some history of manure applications, you may find that a greater amount of organic nitrogen became available this year with the warmer than normal temperatures. Biological activity doubles for every 18°F rise in temperature until the optimum temperature is reached (varies for different organisms). The most efficient soil organic matter decomposers are aerobic; thus, soil respiration rates decline as soil oxygen concentration decreases. Oxygen is most limiting in soils that are saturated with water. Greater oxygen flow occurs in well-aggregated soils that have many macropores. With the conditions this year soils were never saturated and the soil temperatures were above most years. This data below from Iowa State shows the variation in amount of nitrogen that can be released from organic sources if adequate moisture is adequate with warmer soils.

Amount of N Mineralized(% of Organic N)

| Soil | 68 F | 95 F* |
|----------|--------|---------|
| Lester | 138(6) | 518(23) |
| Nicollet | 90(2) | 374(8) |
| Okoboji | 152(2) | 772(9) |

*Incubated for 26 weeks.

ISU; M.A. Tabatabai

This may also help explain why we saw such good yields of corn and soybeans this year in some of our fields and our customers' fields where they have had a history of using gypsum. Gypsum does greatly improve the soil aggregation allowing for better water movement and better soil respiration. The greater water efficiency and soil respiration provides for a higher yield environment and more nitrogen release. This later release of nitrogen helped supply the late needs of these crops.

Lagoon Water can Cause Soils to Become Tight or Have Poorer Infiltration

We have had many conversations with feedlot managers over the years about fields where they apply lagoon water. Usually they are dissatisfied with the yields that are coming from these fields and have noticed that yields seem to be decreasing. Often they have noted that the soils are tight and less permeable. When these soils are tested we usually find that the sodium level may be slightly elevated, but the potassium level is very high. High sodium levels destroy soil structure. Potassium can act much like sodium when the level gets above 8% base saturation causing the soil to become dispersed and lack good soil structure. Caution should be followed when the potassium approaches these levels.

One management recommendation would be to change fields where you are applying the lagoon water so that you don't continue to make matters worse. Another management option is to apply PRO CAL 40 (gypsum) to these fields where the potassium is very

high. This will increase the calcium level and decrease the potassium level so that soil structure is improved and you regain good permeability. Rates to apply can be determined from reviewing the soil test levels. We have experience with this and can help you in making a recommendation. Poor water quality can be continued on these fields if properly managed with gypsum.

Cover Crops Can Serve as a Host Crop

A recent article I read reminded me that some cover crops and weeds can serve as a host crop for some nematodes. Clovers and vetch serve as good host crops during the winter months for soybean cyst nematodes. To a lesser degree weeds such as henbit and chickweed can be good hosts for soybean cyst nematodes. Cowpeas can be good hosts for some types of nematodes. Among these are soybean cyst, root-knot, reniform, stubby root and sting nematodes. However, research has shown that some nematodes will not reproduce as well on certain varieties of cowpeas as others so although they may survive on the roots they will not reproduce as quickly. There is some research that also indicates that ryegrass may suppress soybean cyst nematodes, but ryegrass can also serve as a host for some of the nematodes that are common to corn. If you have a history of nematodes in your fields you may want to do some research into which cover crop “cocktail” would best fit your situation.

Season of Thanksgiving

Although we like to complain about everything from weather to politics we are truly blessed to live in this great country called the USA and here in the Midwest. Soil Solutions would like to thank all of those who are customers of ours this year and in past years. 2012 marks our eleventh year in business and you have truly made it enjoyable and very rewarding. We wish you all a heartfelt Blessed Thanksgiving and Holiday Season!!