



The Growing Edge

Improving Agriculture Through Science & Nature
A Quarterly Newsletter Produced by Ag Tech Services, LLC
for HUMA GRO Clients

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Understanding Plants and Soils

When planning for the 2009 crop season, I think it is important to reflect back to the spring of 2008. I realize most of us would rather not go there, but it is critical to remember what it was like in order to be better prepared. In addition, I observed some soil preparation practices that, when looking back, may not have been the best.

We all know how important it is to prepare a good seed bed. Good seed to soil contact makes for good germination and seedling development. Having said that, if topsoil is prepared well but not the subsoil, we are in for problems. Always anticipate that there will be rain and cold temperatures during this process. If the subsoil is not opened up to allow water to pass through, it will seal up and you will be planting on top of a swimming pool. Not a good visual but we all saw fields like this after planting. Seed rots or the plant is so weak it just sits there somewhere between life and death during the growing season.

The conditions that support good seedling development also support good soil structure. Seed or seed pieces need warmth, oxygen, and moisture to go from dormant to germination. These are the same conditions that the topsoil needs for the soil biological system to wake up and start to flourish. I cannot stress enough how important it is to have a strong, active population of beneficial bacteria and fungi

around the seed or seed piece. They keep the soil friable so water can flow through without ponding. Again, we all remember last spring when some planted fields were like lakes.

Another huge reason to have a strong beneficial bacteria population is for nutrient utilization. Nutrients, both in the soil and applied, need to be solubilized with organic acids to be available to the plant roots. These organic acids are produced by the bacteria. If they are missing so is your efficiency of nutrient utilization. At today's fertilizer prices you need as much available as possible.

Some of the best planting conditions last spring were in fields coming out of a grass rotation. When you plant a grass crop for seed or forage, you have multiple years of stabilization and root activity. When the grass crop comes out and the field is planted into another crop, the results are always more positive compared to a year-to-year cropping system. The soil is more friable, easier to work, and more prone to having a strong biological community.

I realize we can't change the weather patterns. I also realize that the idea is to plant when you can even if the conditions may not be optimum. This article is designed to remind you of what is needed to get the plant up and growing.

BioHumaNetics Educational Conference

Beginning on November 11th, BioHumaNetics, Inc. hosted a three-day educational conference for their distributors and salespeople. This year's conference was titled "Energize Your Crops." This conference brought together sales and research people from the United States and around the world, to share their experiences with the HumaGro product line. New products were also introduced to keep the energy of the company flowing. In order to increase information flow, BHN has set up a blog at <http://biohumanetics.wordpress.com/>. At that location you can see product trials, results, and up-to-date company news.

Even in this difficult economic time, BHN feels it is critical to share product knowledge and applications within their distributors for the benefit of their growers.

Rudy's Corner



I realize that nobody has a completely clear crystal ball with which to tell the future. Mine has been somewhat cloudy on certain topics but there is one thing that is certain; next year will be different than 2008. I can say that with a great deal of certainty because I know fertilizer costs and availability will not be the same as this year. Let me give you a brief outline on the N, P, and K outlook as it is right now.

Nitrogen: This one has softened a bit over the past few weeks. One big reason for this has been the downward price trend for natural gas. Nitrogen pricing and availability has always been tied to natural gas which is used in nitrogen production.

Phosphorus: The phosphorus market at this time is pretty flat. The manufacturers are not under pressure to build inventories and overseas movement is slow. Look for a slight change (it could go either way) from 2008 pricing. That may sound good, but look at the 2008 price of phosphorus!

Potassium: Potash will be on the rise for 2009. There have been production slowdowns due to labor disputes in many mining areas. There is also a mine consolidation in Russia that may reduce the amount of product available to the market. All these factors lean toward higher prices for 2009.

Have you ever wondered why the programs developed by Ag Tech Services, LLC (ATS) do not focus on N, P, and K, but rather on root development and soil biology? It's simple. If you don't have aggressive roots and plant growth promoting bacteria, the amount of N, P, & K that you use is irrelevant. Shocking statement? Not really when you consider the scientific fact that without this program it is virtually impossible for the nutrients to get into the plant's roots. That is why programs developed by ATS show increased yield and quality on all crops.

In summary, with tough times ahead of us in the ag business, this is not the time to run and hide. It is the time to be smarter by knowing what to expect and, most importantly, how to get the most from your inputs.

Next year will be different than 2008 and so shall we.

Small Fruits

At the time of writing this article, I know there are many months before plants start to break dormancy. There is, however, every reason to be prepared for it before you start to see the buds swell. No matter what the market looks like you need to plan for optimum production. Market prices come and go but the health of your plants is a long term investment. In this time of high fertilizer prices and uncertainty in the economic world, it is critical to be smart about your plant health decisions. I'm not saying to forget about your N, P, and K inputs, but rather, look at where your plant needs the most help. Remember, everything revolves around the root system. Often times growers equate a lush, bushy plant

with a healthy plant and a promise of a bumper crop. When top growth is excessive, the root system suffers as does yield. The following will better explain why an aggressive root system will always out perform a bushy plant.

Early root development is critical in all plants but probably more so in multiple fruit bearing raspberries and blueberries. The trigger mechanism for lateral growth, and subsequent fruit spurs, is the concentration of cytokinin produced in the roots. This hormone needs to travel up the xylem tissue and be at a high enough

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Potato Production

I have talked to some potato growers who have the same question: "When will the high cost of fertilizer end?" I think the better question should be "How can I get the most out of my fertilizer dollar?" The first question really has no clear answer due to all the variables involved. The second question however, is one I can answer. When you look at the numbers it is very obvious why it is such an important question.

Using cost information from a highly-regarded national source, I have calculated the cost difference from 2007 to 2008 on an average pre-plant fertilizer mix as well as a planter mix. I used the Pacific Northwest Region pricing structure without freight or fuel surcharges added. The price for the preplant mix was 2.26

times higher in 2008 than in 2007. The planter mix was 2.30 times higher in 2008 than in 2007. We all know that there will be a price variance across the Pacific Northwest Region but my numbers were based on average prices so I do feel comfortable with the results.

My next step was to find the average phosphorus and potassium levels in the fields that I sampled this year. The phosphorus was 147 ppm and the potassium was 318 ppm. Using that information, I formulated a planter mix based on the most current Oregon State University fertilizer guide for short season potatoes grown west of the Cascades. I did not use the WSU fertilizer guide because it was too old. Using the same pricing information I came up with a mix that would save the grower \$195 per acre using more of the soil supplied nutrients. I realize some people would say that mining the soil is not the thing to do. Let me remind you that the nutrient level in the soil is very much like a savings account. You have been making deposits when it was economically feasible. Now it is time for a withdrawal.

Today I had a discussion with an associate, who has his doctorate in potato physiology, on the topic of nutrient

demand in potatoes. It seems with phosphorus the biggest demand is at bulking. Unfortunately for us, that is the same time when we can be at our driest in the upper eight to ten inches of the hill. Because of the dryness, roots will not develop well and the beneficial soil bacteria cannot convert the phosphorus into the form needed by the plant.

I bring this up to remind you that programs developed

by Ag Tech Services, LLC (ATS) are specific for root development. With the high organic acid in furrow treatment, calcium and micro-nutrients in the hill, and a plant growth promoting bacteria inoculant on the seed we do all we can to get the root system going and keep it active. That is why ATS programs work, pure and simple.

Again in 2009 we will be looking at Internal Brown Spot (IBS) and Silver Scurf as two of our prime concerns in potato production. Once again I will say that the physiological problem of IBS is a function of potato stress during bulking and a lack of soluble calcium. Both of these factors can be prevented, if you want to take the proper steps. As always, the decision is yours.

Silver Scurf is a real tough rascal in that it is always there but does not infect the tuber until after vine kill. It seems when the tuber separates from the stolon there is a great hormone shift from bulking to maturation. It is during this time, when the tuber has its lowest level of bulking hormones and increased ABA and ethylene, the Silver Scurf can attack. How

to get around this? Apply weekly rates of a high molybdenum foliar product for the last three weeks before vine kill. Molybdenum has been proven to increase ABA in the tuber which will make it more mature, with a firmer skin set before stolon separation.

In conclusion, 2009 will be the year to be smarter than the problems you face. We will get through it as an industry and be stronger for it.

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Vegetable Production

When I finished the vegetable seed article in the September newsletter, I said I would have yield information on our spinach and pea seed. Based on clean seed weights, our spinach seed crop had a 26% yield increase over the contract average. The pea seed was even better at 66% more than the contract average. This was achieved by good farm practices and focusing on root health. Notice I did not mention the amount of fertilizer used. That's because it was not the main factor. The following two points were the main reason why these results were achieved:

The spinach and peas were able to establish a strong root system early. Neither one of these crops are known for their aggressive roots. Its more likely the roots will die if you look at them cross eyed. In spinach we used a calcium, Superphos, micronutrient, PGPR Galaxy combination treatment right after planting. The plant started early and kept going. There was no negative impact on male or female rows.

If you recall the picture of the pea pods you will remember they all looked the same size and the peas themselves were very uniform. With the peas, we used the BioHumaNetics high phosphorus popup material, a micronutrient package, and the PGPR Galaxy in furrow on the seed. The Galaxy inoculant reduces the amount of sequential sizing of the peas by producing the growth enhancing hormones at the root level. This is a very important because the hormone IAA is produced at the top of the plant and travels down to keep the roots growing. When the pods start to set, the IAA that would have gone to the roots now goes to the developing pods. Without the Galaxy bacterial inoculant, the roots would start to die leaving the pods without water and nutrients. Again, take care of the roots and they will take care of you.

As graphic as these results are, they are not out of the ordinary. I think they were somewhat higher because of the adverse growing conditions we had this year. You may not see 26% or 66% increases but you will always get positive results.

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concentration at the leaf axis to promote the axillary bud development. Because cytokinin is only produced in the roots, you can see that if you have more actively-growing roots you will have more cytokinin produced. The more cytokinin produced the higher probability of better lateral branching and fruit set. An early drench application of Vitol, SuperPhos, and PGPR Galaxy will shift your plant's root system into high gear.

Along with early root development, get the most out of every

bud on the bush. Obviously we can't stop a freeze but when you have bud emergence it is a good time to apply a bud stimulant like BioHumaNetics' Breakout. Breakout is a high phosphorus compound with a complete growth package for bud emergence. Breakout should be applied at early bud break for best results.

All of this is to be ready for early spring. We will keep in touch on timing of applications.