



# The Growing Edge

Improving Agriculture Through Science & Nature  
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## Understanding Plants and Soils

**A**s harvest is in full swing, it is important to not only look at this year's results, but also think about what to do in the field you have just harvested. If it is a one-year rental, then the options are pretty limited: you need to basically leave it in the condition agreed upon before planting.

If the field is a long-term lease or if it is a field that you own, there are many options for residue management to consider. In this article, we will examine the pros and cons of residue management and tillage methods.

### Residue Management

The age-old question has always been what to do with the plant residue from your crop: bale it or work it into the soil. If you have a market for pea hay or grain straw, then you should look at the economics of bailing it off. If not, then chopping it up and tilling it into the soil is the right thing to do. By doing so, you are adding to the soil organic matter making the soil more friable for future years. Also, adding plant residue aids in maintaining the soil biological system. The plant residue keeps the soil in an aerobic condition providing oxygen to the bacteria and fungi. This will aid in the breakdown of the plant residue as well.

There is a down side in that if there are pathogens overwintering on the plant residue they will still be there for the next year. We will look at management of this problem later in this article.

### Physical Soil Management

Sub soiling in the fall is a very good way to break up any "plow pan" or impervious soil layer. This can be a natural or man-made problem but either way it prevents water movement through the soil profile.

Planting winter cover crops will not only utilize excess nitrogen keeping it out of the soil water but also add to soil tilth. Winter wheat, rye, or even annual ryegrass are very good at keeping nitrogen out of the water supply, adding nutrients in the spring, and maintaining soil structure.

The other aspect of soil management is forgetting the problems you had during the previous growing season. It is easy to forget where water was ponding or where there was a sand streak until the next crop is growing there. Take notes and keep them handy for the next growing season.

### Breakdown of Soil Residue

In a perfect world the plant residue that you tilled into the soil in the fall would be broken down by next spring. Mother Nature is not always that fast, so you may have to give her a hand.

Two products that have a good track record are Micro Digest, made by Holmes ENVIRO, and Lase, made by BioHumaNetics. They can be used separately or together. The Micro Digest is a biological inoculant that helps break down the plant residue and suppress any pathogen spores that may be over-wintering. The Lase does much the same, but it also stimulates the soil biology to work on the plant residue. Together they work very well to create a problem free planting environment in the spring.

These are just a few ideas on managing a field for the following crop season. The more you can do now, the better off you are when the planting window begins to close.

## Rudy's Corner



There seem to be two times when a grower takes a hard look at yield; once is in winter or early spring when budgeting for the new year, and the second is at harvest when you can actually see what you have.

In the budgeting process it is a good time to look at the term maximum economic yield (MEY). This is a way to project your income based on the amount of cost you want to put into your crop.

The term MEY was first coined in the Midwest during the 1980s. There the profit margin was so thin on commodity crops that they had to look at every expense very closely. This is not to say that we do not look at expenses closely here in the Pacific Northwest. Our crops, however, have a much greater profit potential than corn, soybeans, and sunflowers in the Dakotas.

To implement a MEY system on your crop, look at what it would take to break even. I realize our goal is not to break even but we need a starting point. By knowing what kind of yield and price you need to break even, now you can calculate the cost of inputs to get you there. Once you have your costs and income established for a break-even year, then you can compute what it would take to get a 3, 5, or 10 percent profit on that crop. This is where the expenses could outweigh the return. If your cost for a 10% profit is greater than the profit itself, perhaps looking at a 5% profit is better. In other words, if it takes \$1,000 extra per acre to get \$500, maybe you should go down another road.

The MEY system is easier to measure on crops that have a contract price and set quality standards. Crops like vegetable seed, peas, corn, or cucumbers would have an easier method of measuring results than fresh market crops like potatoes or small fruit. When you know what it takes to grow 1,500 pounds of spinach seed do you really want to add another 100 pounds of fertilizer if you are not relatively sure you will get your money back? That 1,500 pounds is your MEY.

I think everyone does something similar to this in their early planning but it makes sense to look at it very closely in today's economic climate. In a recent trade publication I read that farmers on a national scale had an increase of 8% in production costs. The question is, did they get 10% back for that 8% increase? Not in all cases, I'm certain of that.

In today's economy and with the future outlook not that bright, there are always expenses that can be reduced. What you do not want to do is to "watch the pennies while the dollars go out the door."

Although I have been talking about expense control, you still need to spend the money for a good fertility program, quality seed, and the best herbicide. Trying to cut out some of the real important inputs can really hurt. Its all about planning and communicating with the right people.

## Potato Production

I think this year, when you factor out the highs and lows, will be better than 2008. How can it not be? We actually had the crop planted in about 30 days instead of 50-60 days, the plants started off strong in the spring which was not the case in 2008 and there was a real growing season. With the exception of a very dry month of June, we had a fairly typical growing season. But like any other season, there were a few things I learned that I would like to pass on to you.

First, if you have a field that will not get irrigation or if you have weak-rooted varieties, I found that an application of MicroF, made by BioHumaNetics, Inc. seems to trigger the plant's resistance to drought. After some research, I learned that the components of this product send a signal through the plant's salicylic pathway to reduce the stress of lack of water. This is a very good use of the \$9 per pint cost of the product. The top picture on the right is of a field of red potatoes that did not get irrigation and only about ¼ inch of rain during our dry month of June. The middle picture shows the vigor of the plants while the bottom picture is an indication of yield.

The other item of discovery is similar to what I have discussed before. Our use of potassium is in excess of what the potato tuber can utilize. Consider the following: A potato is approximately 85% water leaving 15% dry matter. Of the nutrients contained in the tuber, only 3% it is potassium. If you have an average 25 ton per acre crop this would give you a dry matter amount of 3.75 ton per acre of dry matter. Of this only 3% or 225 pounds is potassium in your tuber. And yet we apply much more than that amount as a pre-plant broadcast or a planter mix. I think this should be examined more closely for next spring. I see no reason to apply as much as we do when so much is in the soil. The other aspect of potassium is the unstable situation of production. Where the majority of potassium is mined and refined, the government stability is not very friendly toward American growers. Believe me, if they can get more for their products in other non-U.S. Markets they will. This will do nothing but raise our prices which makes using more than what is needed even less desirable.

As I said in the beginning of this article, I think 2009 will be much better than 2008. Now we just need to look forward to 2010.



## Vegetable Production

**T**he vegetable seed industry this year did not like a rain-free month of June. The yields and quality are about as variable as who got some rain and how much did they get.

One bright spot was a field of peas grown for seed that turned out very well. The photos here show the crop at three weeks old and again at six weeks. As you can see, the amount of nodules increased dramatically as the plants got older.



After three weeks



After six weeks

The exciting aspect of this is that a plant will not allow nodules to form if it is under stress. These plants were not under stress even without rain. The supplemental treatment was a single application of HumaGro's 1-19-0 plus a biological inoculant at planting. The yield was nearly double the average for this crop.

Spinach seed has been fairly average, again with a very dry June to blame. In many cases, there was plenty of nutrition in the soil at pre-bolting stage. We just didn't get the rainfall to make it available to the plant.

We cannot control the weather but we can set the crop up for success. The peas shown at the left are a good case for how that is done.

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## Small Fruits

**T**he small fruit business this year has been fairly good overall. Most raspberries and blueberries have had decent yields and fair to good quality. The market value on both is still worlds apart but that is the nature of the business.

The one very exciting topic that I dealt with this year was using a unique type of nitrogen on a blueberry field. The goal was to get the tissue nitrogen up to 2.8 to 3.0 percent and keep the plant growing. We accomplished this with using HumaGro's Super Nitro (30-0-0) at a rate of one gallon per acre. Some fields increased

nitrogen levels slightly but most stayed the same. But the continuation of growth was very good.

As the harvest season comes to a close, it is a good idea to look at setting your plants up for the winter. It is customary to apply a fertilizer low in nitrogen and high in phosphorous at this time. I would suggest an application of HumaGro's 1-19-0 at two quarts per acre either through the drip, drenched, or injected into the root system. Along with a high ortho-phos analysis, this product also contains 18 percent organic acids that are needed for root growth and health.