pig pasture / people brassicas

Contributed by go-nofa@yahoogroups.com
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cold/wet weather and nutient availability

I planted a two acre rape pasture to graze some of my pigs on this year and was disappointed with the yield, although this year I suppose only the most accomplished farmers had really good yields of anything other than water- and cool-loving crops. Anyway, it was a wet field with a few low spots, and in and surrounding the low spots, there was an obvious phosphorous deficiency. The rape plants were stunted and purplish.

The field has been fallow for nearly ten years and was primarily golden rod and wild parsnip. The last crop that was planted in it was corn. The only fertilizing that I did was a moderate application of fresh horse manure (pine shavings bedding) the fall before and a moderate application of finished compost in the spring. (I did not have any soil samples done, so I do not know the pH, but, generally speaking, the soils on our hillside are high lime soils)

I know that brassicas are heavy phosphorous feeders, but I figured that I would get away with just the manure and compost. In a drier year, I might have, but I am not positive, so I am writing to seek advice on organic sources of phosphorous, preferably, if possible, locally available and low cost. I am not a huge fan of organic input substitution and one of the things I like about rape is that it is cheap. As a pig pasture it is about equal with red clover and alfalfa, so the decision to plant rape is based primarily on economics.

(A further management note would be that I am working toward a system of annual pig pastures that are grazed bare or nearly bare by the end of the season and then covered with rye for the winter. In the spring, after taking a cutting of rye for straw, the stubble will be disced in and the field prepared for planting. I have found that to get the pigs to get enough value forage-wise off the paddock they need to be left on it long enough that they will do at least some moderate rooting, which requires discing and reseeding the worst spots to manage permanent or multi-season pastures for continued yields and quality, and while this might only amount to 15%-25% of the paddock, I have decided that the labor and expense is about equal to complete renovation, especially if the pigs come back around because the timing is generally such that the newly seeded spots are not well-enough established to withstand grazing. The reason that I am managing the pastures to be grazed bare or nearly so is so that I can avoid using a moldboard plow. I hope to only use a moldboard plow to break sod. The rest of the time I hope to only need a disc.)

Any and all advice regarding the phosphorous (and the pig pastures, generally speaking) would be appreciated.

Best regards,
Bob

----------Hi Bob,

You did a great job of describing your field. I¹ve seen similar situations many times before. The cold wet weather reduced the soil¹s rate of biological activity causing both phosphorous and nitrogen to mineralize much slower than normal. Some of the soil microbes need nitrate nitrogen. When there is a shortage, the microbes take what they need first leaving the crop with a shortage. Phosphorous cycles even more slowly when this happens.

In land that has been fallow for several years, with plants like golden rod and wild parsnip dominating, the soil biology is shifting from an active bacterially dominated system to a slower more fungal dominated one. The C/N ratio of the organic matter in such soils is wide and the total amount of

carbon is usually quite high. Such soils are good places for woody plants to establish because there are few annuals competing with them. They have a very slow rate of organic matter cycling and are usually low in soluble phosphorous.

The combination of this year¹s weather and such a soil situation is especially hard on non-mycorhizal crops (like brassicas) that need a lot of rapidly cycling fertility.

I think you need to start from the biology rather than the chemistry if you want to avoid using large amounts of off farm inputs to grow crops like rape.

Getting soil to become more biologically active and higher in soluble minerals requires oxygen, nitrogen, and Œyoung¹ carbon. That means the right kind of tillage and fresh organic matter. The moldbord plow and other tillage implements are very good at introducing oxygen, releasing trapped gasses, and stimulating bacterial growth/nitrogen mineralization. When tillage is overdone, it leads to organic matter loss and erosion. When it is underdone, it leads to low levels of biological activity, low yields, and anaerobic conditions. When that happens, undecomposed organic matter builds up because of reduced biological activity. Fortunately, all of our tillage doesn¹t need to be done with machines, earthworms, hooves, rotting roots and ground beetles all provide some tillage.

Chemical no-till deals with this by applying huge amounts of synthetic nitrogen. The synthetic nitrogen stimulates biological activity but doesn¹t supply any carbon for the bacteria to live on. The bacteria in turn consume soil humus to get the carbon they need and release more nitrogen as the stored fertility that was in the humus is freed. It¹s like burning your house to keep it warm. That¹s why contrary to what we are told, after many years of chemical no-till there is no increase in total soil organic matter. There is a re-distribution of OM as the top inch or so increases. (That is the only information Monsanto wants us to receive.) At the same time though, the rest of the soil profile loses organic matter faster than the surface gains it.

The key is to always add carbon along with nitrogen and to keep the soil alive and active. As long as we produce a little more carbon than we use each year, our soil will improve. Stopping carbon loss by reducing biological activity, (less respiration) can lead to less photosynthesis and can actually cause a net loss of organic matter.

Oats are a good Œpioneer crop¹ to use in converting the soil from perennial crops to annuals. Their roots are well adapted to recently disturbed fungal dominated soils. They are also a good nurse crop to establish clover. Clover has a narrow C/N ratio and is high in sugars. Compost, lime, manure with a lot of bedding, wood ash, etc all are very good amendments to apply to actively growing clover because there is plenty of biological activity going on to incorporate it into the soil and the growing clover quickly picks up soluble minerals as they are released and keeps them from leaching.

Buckwheat is another great pioneer crop that can be used as a forage. It releases tied up phosphorous and makes the soil more mellow to prepare it for other crops.

If you are very low in phosphorous, you can also put 1 to 2 tons per acre of poultry litter on the clover cover crop to boost your phosphorous level. Poultry litter also gives you a lot of trace elements, potassium, and nitrogen. If you need lime, it is best to use layer manure. It contains about 10% calcium (limestone is 30% Ca) and can greatly reduce you lime bill. If you are high enough in lime, it¹s better not to over apply calcium and broiler manure or turkey manure might be a better choice. Poultry litter got way over priced last year, I think you should be able to get it for not over $10 per ton plus the trucking. Don¹t be afraid to plow your

soil when there is a heavy cover crop on it. A properly adjusted and operated moldboard plow does a lot less damage to the soil than a rotovator or excessive disking does and it will stimulate a burst of aerobic biological activity right when your rape crop needs it.

Whenever you purchase feed, your farm gains phosphorous. When you sell pork, a little phosphorous leaves in the meat. The biggest loss of phosphorous on many farms is leaching and erosion especially where it is not cover cropped. You may benefit from soil testing and a doing some focused soil building for a few years with materials like poultry litter and mineral amendments for a few years to boost your land¹s productivity. Once you get both your fertility and biological activity up, you should not need many off farm inputs.

I¹m sorry for the long rambling answer, I feel that a simple short answer could not avoid directing you to an input substitution system.

I hope this helps you.

Klaas

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