Why Precision Agriculture Makes Sense

Precision Agriculture has been a common topic in US agriculture for ten plus years now. As is the case with lots of changes in ag or other areas, the adoption of different segments of Precision Agriculture has been sporadic. There are now a lot of combines with geo-referenced yield monitors. They can be used to identify areas of significant yield variances with in a specific field. This information when combined with investigative techniques can lead a farmer to change some practice that can result in increased yields, and hopefully increased income.

This article will concentrate on the areas of soil pH and nutrition. One of the fastest ways to improve profitability from using Precision Agriculture, in this case grid sampling. Different soil types require different amounts of lime to effect a change in pH. For example, it takes three times as much ENM to raise the pH of Clay soils as it does for Sandy soils. So if you mix two samples of soil together, one that is Sandy and one that is Clay, you will be over applying lime on the Sandy soil area and under applying lime on the Clay soil area. So far though, this hasn't cost you any money unless you assume that your will have a yield loss.

Now though, take into account how the pH scale works. A pH of 7.0 is considered neutral. But the scale is logarithmic. A pH of 6.0 is 10 times as acidic as 7.0. But a pH of 5.0 is 10 times as acidic as a 6.0, thus a 5.0 is 100 times as acidic as 7.0. A pH of 4.0 is 1000 times as acidic as 7.0. So how does this save you money by grid sampling? Lets take a 100 acre field that is grid sampled using 3.3 acre grids. That would require 30 samples. 27 of those samples could, when tested individually, show no need for lime. They might have a pH of 6.8 which is nearly neutral. But three of the samples test 5.5 pH. If the 30 samples were combined into a composite sample, the pH would be somewhere under 6.0 and would result in calling for lime to be applied on the entire field in a significant amount. By grid sampling you would find that you only need lime on 3 of the thirty grids or ten acres. So you would put 4 ton of lime on ten acres for a total of 40 ton or you would put 2 ton per acre on 100 acres for a total of 200 ton.

The above example is obviously an extreme one, but we have seen just such a thing happen. And it is only a rare occasion where grid sampling doesn't result in a reduction in the total amount of lime required on a given field.

The second aspect of this discussion is that of soil nutrition. When the concept of grid sampling for soil fertility first came up many assumed that they would find that low soil fertility would correspond to areas of lower yields. But the contrary has in fact been the case. The reason; higher yielding areas of the field have been systematically using more fertilizer than has replaced through traditional fertilization. On the other hand areas of the field that have not yielded as well have had more nutrients added back than the crops have taken out. If this practice continues the day will come when the high yielding areas will no longer be able maintain the level of production that they currently experience because there is not enough nutrients in the soil to maintain that level of production. But based on the composite soil test the entire field is being adequately fertilized. Thus it makes sense to variable rate apply fertilizer to get the needed fertility to the higher yielding areas to maintain those yields while at the same time not applying as much to lower yielding areas.

CMAS is committed to Precision Agriculture. We have added an additional multi-product, variable-rate applicator that also can apply herbicides. While CMAS has qualified sales professionals that are well versed in Precision Agriculture, we anticipate having a Precision Agriculture Specialist on staff before spring. If you are interested in learning more, contact any of our sales staff.