ADVANCED AG SYSTEMS'

Crop Soil News

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November 2019

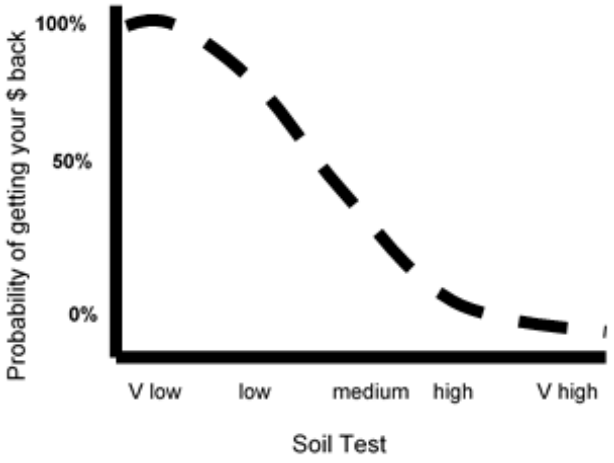
"It is the crops that feed the cows that make the milk which creates the money."

Advanced Ag Systems
Research, Education, Consulting

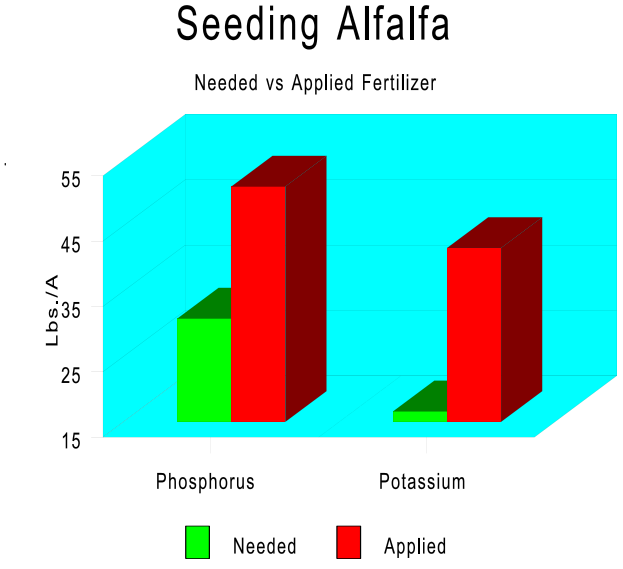
Surviving Underwater

We have had more than 4 years of very adverse economy in the dairy industry. Farmers have tightened their belts until it touches their backbone. Making it though will mean every part of the farm system needs scrutiny. One area is in the cropping program, where more than 40 years ago an agriculture banker said it was the biggest hidden profit loss on the farm, and often is still today. Livestock need forage. Growing it needs to cost less than purchased. Unfortunately many farms have fallen back to short cuts that are very expensive.

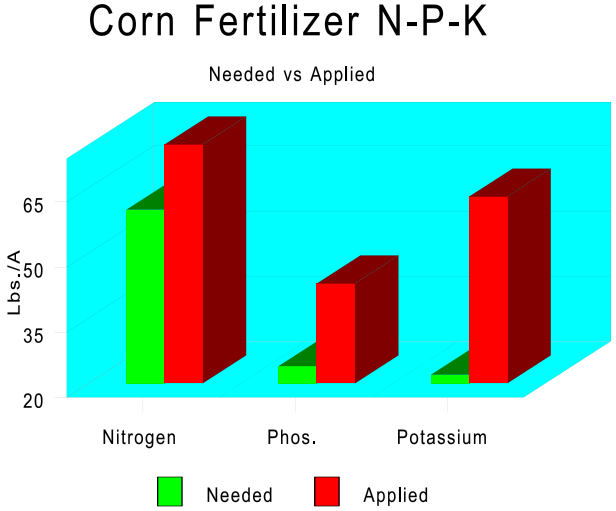
The key management is to know when fertilizer will give a response and when it will not. This is the reason for soil sampling. If the test is very low, low, or medium, the odds are greater than 50% of getting your money back. You should add the fertilizer needed to maximize the crop yield. As soil levels approach high and very high, yields are not held back by the lack of nutrients, but rather other factors such as compaction or soil structure or moisture availability. At high test levels there is a very **small to no chance of getting your money back.** Unfortunately, you have to pay the fertilizer bill whether you get a return or not. The soil test gives you the answer without risking yield or checkbook losses.



Each field you plant, you are betting (investing) that you will get back more than your input cost. Fertilizer is the easiest to determine how much should be invested with a high probability that you are going to get it back in increased yields. Unfortunately, the rush of time and the many chores you have to do, you never get around to determining exactly what each field needs. You can never get "to it." **This comes at a price**. The graph on the right is from an actual study of 10 farms. They had applied fertilizer as they normally had based on their best estimate of what the crop needed. The first bar of the graph was how much was needed for maximum economic yield based



on a university soil test. As you can see by the graph on the previous page, considerably (more than double) more fertilizer P & K is applied to seedings than is needed. This is because when it was in corn, manure was heavily applied, adding more phosphorous and potassium than the corn could ever use. Ironically, I have been finding established alfalfa stands that have gone out before their time because of a lack of lime, or topdressing, or both. The fertilizer budget was over spent on the seeding and none used to keep established stands productive. A soil test will give you the amounts of both for maximum economic yield for both seeding and for topdressing the stand in the following year.



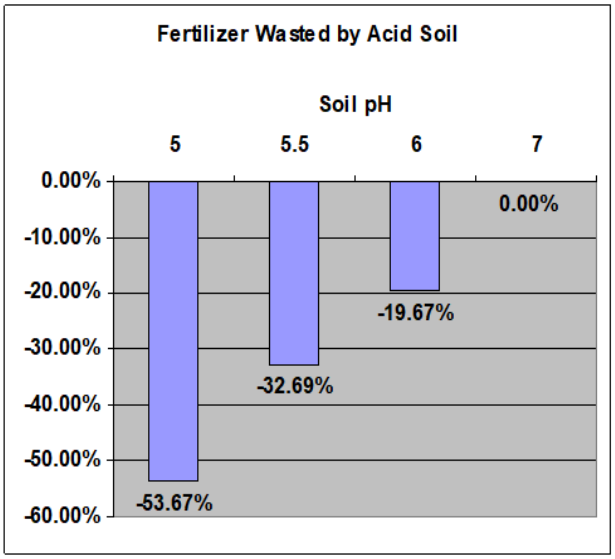
The same problem is occurring in cornfields. In the graph at right, the amounts of P & K used are more than triple what was needed for maximum economic yield. This is a no brainer on most dairy farms as that is where the manure has been spread. It is even worse if manure is spread without immediate incorporation. This builds phosphorous and potassium to high levels quickly. **At a high level there is NO response to added starter phosphorous and potassium fertilizer** based on replicated university research. Research continues to support this conclusion. With the extreme cost/price squeeze of the past few years, profit is only applying the amounts that make you money. **Applying more than needed directly erodes the profit of making you own forage.** Fertilizer does not limit many cornfields, but by the lack of lime, increasingly does.

How did no phosphorous starter research hold up in a cold, wet spring?

The year of the trial, May started warm and dropped as the month progressed. The deluge of cold rain on Mother's day started the slide that culminated in 5 – 6 inches of snow at the end of May. There were 16 on-farm trials corn silage trials conducted in nine New York counties by Dr. Ketterings of Cornell. Research on cold, wet, LOW to medium PHOSPHORUS tested soils, showed a response. You **increased yield and made money with P banded**. **In spite of the cold wet weather, there was NO response to P on these soils testing high in phosphorus.** This lack of response occurred in both silage and in grain. There was a response to a starter fertilizer containing Nitrogen. If P and K are high, just use banded nitrogen as your starter.

Should I Just Cut Back On Fertilizer Purchases?

Absolutely **NOT**. That is equivalent to reducing feed purchases by cutting back on feeding grain, regardless of how they are milking. It is distressing to see farms fertilizing by best guess, and then shorting their profitability some where else because "enough" money was spent on fertilizer. If you cannot get your whole farm sampled, **concentrate on corn fields and fields that are going to be seeded**. These have the earliest fertilizer additions. Hay fields can be sampled after first cutting and the top dressing applied after second cutting.



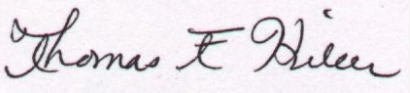
The biggest regulator of the return on your fertilizer investment is to raise the pH to **6.2 for corn or 7.0 for legumes**. This is where expensive fertilizer is most available and the plant growth can make the most use of it. As the pH drops, fertilizer efficiency drops 30 – 50% in producing crop yield.

Correct pH soil is a BASIC MANAGEMENT PRINCIPLE for any manager who has any desire to run a profitable farm. A few years back I worked with a top managed farm that started a complete farm soil testing program. He discovered to his surprise, he had alfalfa fields that were at

a **pH too low to ever grow corn well**! Ironically, he was putting too much fertilizer on high testing manured corn fields, to the point of hurting plant growth by tying up minor elements. What he saved on fertilizer more than paid for the needed 1ime IN ONE YEAR! Since then, several more farms have gone on to whole farm soil testing and have had the same results: decreased fertilizer bills and an increased need for corrective liming, and less expensive forage cost for the yield achieved. As the price of fertilizer continues to go up, the investment in this critical part of your crop production demands the highest return on each dollar invested. Unfortunately as more farms are finding the benefit of comprehensive soil testing and recommendations, we were learning that they were severely handicapped in forage profit for several years for having low pH. Fields of 5.4 – 5.8 are common, especially on rented ground. They tried to save on fertilizer by no liming. At these pH levels, as the chart below shows, **you are throwing away a third of your fertilizer** impact. Even at **pH 6.0, nearly 20% (one bag in five) is lost** due to the acid soil's effect on availability. In this era of high prices, correcting the pH FIRST and then adding what fertilizer the checkbook will allow you, is the way to maximize the return in your crop.

Soil pH	Nitrogen efficiency	Phosphorous efficiency	Potassium efficiency
7.0	100%	100%	100%
6.0	89%	52%	100%
5.5	77%	48%	77%

Sincerely,



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