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About Your Fields

A Newsletter From Akron Services Harvest 2016

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What's Next?

By Kevin Knisley, C.C.A.

I know that I have used this headline be fore, but I feel it is very fitting to talk about what we should look forward to in the next few weeks. This is the first in a series of newsletters that we will send out dealing with decisions that you will be making that will have a profound influence on next year's crop. Many people probably think that the 2017 crop doesn't start until the planter puts the seed in the ground, or maybe when the check is written for the chemicals or seed this winter. I would challenge you to think that decisions made now will affect next year's crop. Whether it is what is planted where, what type of seed you buy, how much fertilizer you apply or what type of tillage you perform this fall, they all affect next year's crop and sometimes other crops for years to come.

Properly Managing Your Bank Accounts is Important

When it comes to your soil and crops I want you to think of them as different types of bank accounts. Your crops are your checking account and they make regular withdrawals and occasionally when you run short you have to transfer funds from your investment account which is your soil. All summer long we have been talking about your checking account and what you needed to spend to get the maximum return on your investment. Occasionally, your account became overdrawn and you drew on your investment account.

Well good news we have closed your checking account (your crop) for this year, and now is the time to look back and see what we need to do to enhance and balance your investment account, your soil. Just like any good portfolio you must make sure you have a good mix of investments (pH, phosphorus, potassium). Everything must be balanced in the proper ratios to ensure maximum growth. One of the first questions we must ask ourselves is what areas did we spend more than we had in our account and did we go below the minimum balances this year. How do we figure that? We look at yield and what did the crop remove. A bushel of corn removes .38 pounds of Phosphorus (P205), .3 pounds of Potassium (K20), and .07 pounds of Sulphur (S) and a bushel of soybeans removes .8 pounds of Phosphorus, 1.4 pounds of Potassium and .22 pounds of Sulphur.

Nutrient	200 bu cn	250 bu cn	50 bu SB	75 bu SB
P205	76	95	40	60
K20	60	75	70	105
S	14	18	11	17

Lets consider a typical fertilizer plan:

Credit/Debit Source	P2O5 (lbs/ac)	K2O (lbs/ac)	Sulfur (lbs/ac)
Typical 2 yr application (36-92-120)	92	120	0
250 bu corn removal	95	75	18
75 bu soybean removal	60	105	15.4
Balance:	-63 lb P2O5	-60 lb K2O	- 35 lb Sulfur

As you can see, there is deficiency in all 3 nutrients and your bank account (soil tests) have been depleted. Maybe your bank account can handle this for a time. We feel soil test P values should range 50 to 70 lbs/ac and K values 325 to 400 lb/ac. When you use the figures of 9 pounds of P2O5 and 4 pounds of K2O to change a soil test 1 pound, you removed enough extra nutrients from the example above to lower you soil test (bank account) 7 pounds of P and 15 pounds of K. If you do not put enough fertilizer down to replenish what you have removed, we need to find a way to make the fertilizer that we do put down more efficient.

Making Your Fertilizer Work as Hard as You Do

A few of you might remember this as a title for a series of videos that we put up on our website a few years ago. The reason we talk about making your fertilizer work as hard as you is because soil applied fertilizers are inherently inefficient. Phosphorus fertilizers are only 5 to 30% efficient and Potassium fertilizers are a little better at 30 to 60% efficient. This has to do with a few factors such as CEC, organic material, water holding capacity and a few other things. To improve efficiency we suggest you try Hydra Hume at a rate of 10 pounds per acre. Hydra Hume will help fertilizer particles bind to the soil making it more available. How does Hydra Hume accomplish this? Because Hydra Hume has a divalent charge and this allows the negatively charged soil and the negatively charged phosphorus and potassium molecules to bind together.

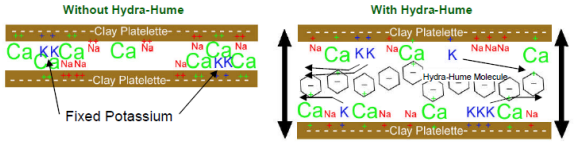
As you can see in these diagrams Hydra-Hume works to make both Potassium and Phosphorus more available. When added to Phosphorus it helps to sequester Calcium ions away from the Phosphorus, making it more available. In Potassium fertilizers it helps to make sure clay particles do not bind the Potassium molecules up .

Increasing Potassium Availability

Researchers have identified two mechanisms that account for Hydra-Hume's ability to increase the availability of Potassium to plants.

1. Hydra-Hume aids in releasing fixed Potassium from clays

Working with Calcium, Hydra-Hume increases the space between clay platelets, giving potassium more room to move out into the soil solution where plants can take it up.



2. Hydra-Hume increases the rate of active Potassium uptake

The organic acids in Hydra-Hume have been shown to increase the rate of active nutrient uptake. Potassium will move into the plant up to 35% faster because the mitochondria in the cell membrane respire faster, giving more energy for active potassium uptake.

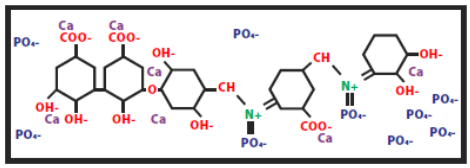
Additional Benefits

Hydra-Hume works with Potassium to regulate plant-water relationships

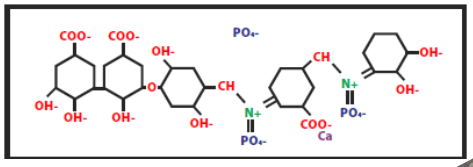
Potassium is used by the plant to maintain turgor and open and close stomates (the little pores on the under sides of the leaves). Adequate potassium levels assure that the plant can control its rate of transpiration and regulate moisture movement within the plant.

Hydra-Hume and Phosphorus

1. Hydra-Hume Sequesters Calcium Away From Phosphate (Ca)

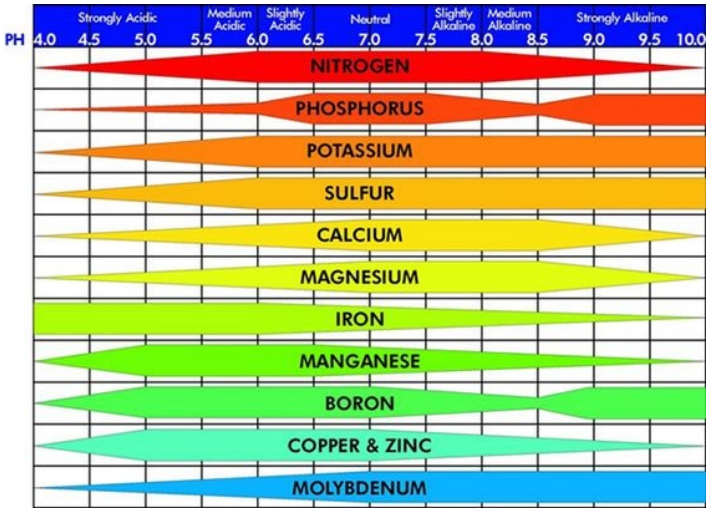


2. Hydra-Hume Organically Complexes Phosphate (PO_4)



Riding the Rollercoaster of Soil pH

The final topic I wish to address is what I feel is probably the most important one for us to correct and also one that we must start to look at differently, pH. If your soil pH is out of balance then everything else will not be balanced. If you remember when I started this newsletter I suggested that you look at your soil as an investment portfolio that needs to be balanced. If your pH is too high or too low then you are not allowing the nutrients to be utilized efficiently. The chart below show that if your pH drops below 6.0 availability of the macro nutrients of Nitrogen, Phosphorus, and Potassium start to decrease, so it is very important

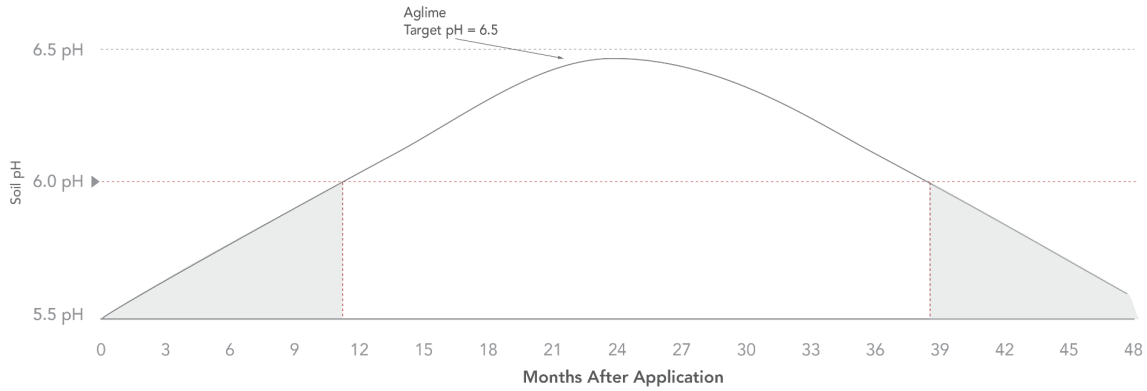


to keep you pH at the proper levels. The way that we have historically done this is by soil testing every 4 years and then making the correction by using Ag lime. The problem with this is that when you analyze a typical sample from a quarry you will find that close to 50% of the material will not pass through a 60 mesh screen and that material is basically just rock that will take too long to break down and be useful. As you can see in the diagram below typical Ag lime peaks in it's effectiveness at about 24 months and then starts to drop off. Just think of the potential bushels that are lost because of the rollercoaster ride your pH is on. Couple this with the fact that it seems the quarries are not willing to produce ag lime in the quantities that they once did, we here at Akron Services have decided to look for a way to help flatten out the rollercoaster ride and maintain your pH at a much more consistent level year in and year out.

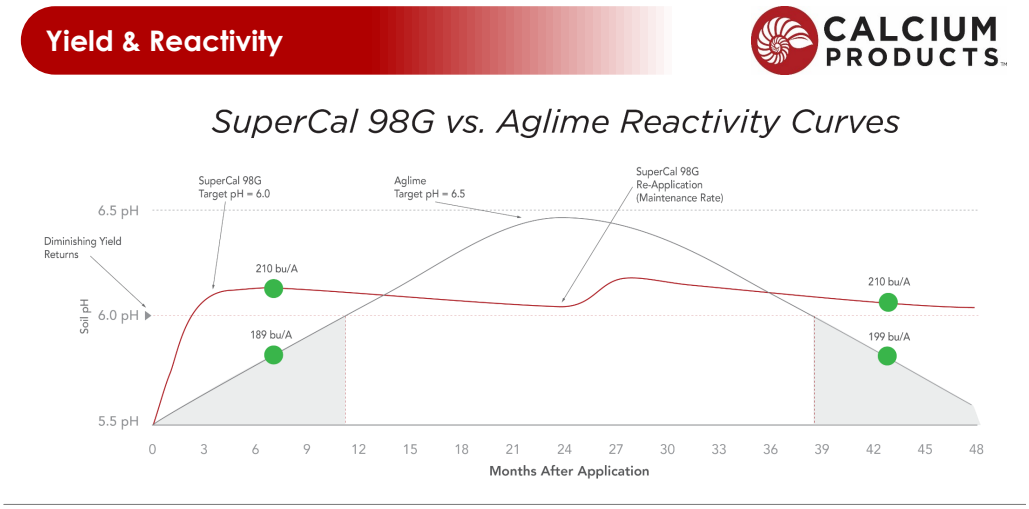
Aglime Reactivity

CALCIUM PRODUCTS™

Typical Aglime Reactivity Curve



The alternative that we came up with is a pelletized lime product called SUPERCAL 98G. 98G is different from many liming materials in the fact that it is not finely ground limestone. It comes from a deposit of fossilized sea shells that is found in western Iowa called calcitic limestone. Due to it's higher calcium content 98G will react quicker to neutralize the hydrogen ions that lower pH. You can see this by clicking on the video link below where we compare the reaction times of 98G to both Valley quarry and Vermillion quarry lime that we normally spread. As you can see in the chart below 98G reacts quicker to correct the pH and stays consistent for about the same amount of time as regular ag lime. When you overlay the two curves 98G shows how we can capture more bushels by keeping the pH constant. In order to keep this curve flatter we recommend that instead of spreading lime every 4 years, we would spread 98G every two years or whenever you follow corn.



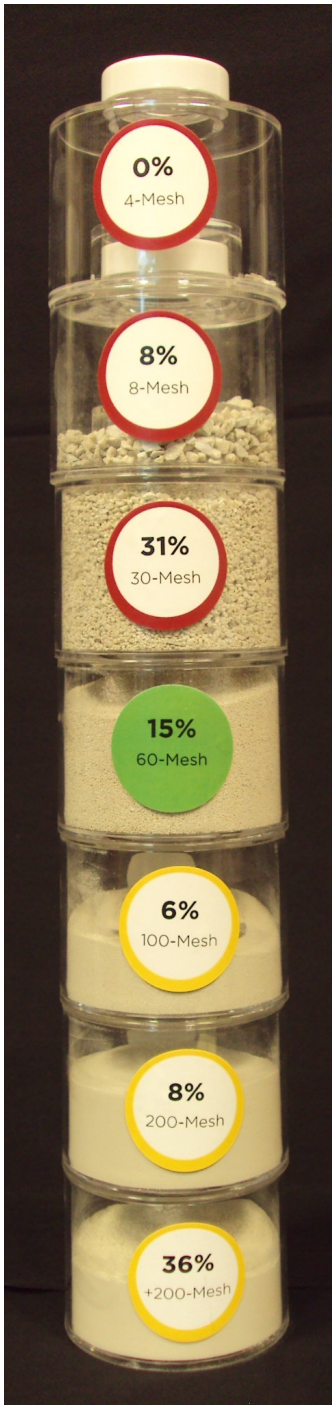
* Relative Yield Percentages from USDA *Soil Quality Indicators: Soil pH* (2011)

Why do we recommend spreading pellet lime more often? Because pH is affected by Nitrogen fertilizers used in corn production. To counteract the effect of Nitrogen fertilizers you should spread 1.5 pounds of 98G for every pound of actual N applied. Sulphur is another factor in lowering pH and you should spread 1.25 pounds of 98G for every pound of Sulphur applied to a field. We feel that if we follow this plan you can keep your pH at a constant level between 6.0 to 6.5 which is optimum. Now many of you might think that is all right if your pH is already at 6.0 to 6.5, but what do I do if my pH is below 6.0? In this scenario we would recommend using regular Ag lime to build up to the 6.0 level or above due to cost factors, but once you get there us 98G to keep you pH at the proper levels.

pH Rollercoaster Cont.

Another quality of 98G that we like is the uniformity of particle size. This helps out in two ways, the ability to get a more even spread and a quicker reaction time. Unlike regular lime, 70% of 98G will pass through a 200 mesh screen, and 90% will pass through a 100 mesh screen. In comparison 50% or less of regular ag lime will pass through a 60 mesh screen depending on the grind. I have included a picture of sample from both of the quarry's that we pull from that shows the percentage of material that will pass through the different size screens. I know you are saying with all of the fine material, how will it give you a more uniform spread? That is where the palletization comes into play by giving us a uniform pellet, the spreader will be able to spread the liming material out further into the pattern. With traditional Ag lime that is not the case as the finer particles that make up the grind will not spread as evenly out into the pattern. This is why you sometimes see a big dust cloud right behind the spreader. Also due to the fineness of the grind 400 to 500 pounds of 98G will have the equivalent surface area of 1 ton of Ag lime, and depending on the source it could have greater neutralizing abilities. If you are straight spreading and are using a lower rate you could also mix 98G with your fertilizer saving you a spreading charge. However if you variable rate your lime we recommend you do this with your 98G as well because there is no reason to spread on an area that the pH is already where we want it to be, this goes back to keeping everything in balance. If you have any questions please feel free to contact any of us and discuss how 98G could fit into your program.

Vermillion Quarry



Valley Quarry

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