



Pro-Ag Update

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A Very Successful Year

2010 was another record breaking year for Pro-Ag Consulting®, LLC. Thanks to your continued patronage, we were able to sample more acres and run more samples than any other year in our history. In just eight short years, you have helped us double in size. That is a 12 and a half percent increase each year. Without your continued support, these numbers could not be possible. It was a very good year for the five new owners to experience ownership for the first time.

Pro-Ag Consulting®, LLC now tests soil in eight states. We have 22,549 fields in our program that total more than 900,000 acres.

Again, we thank you for your new business as well as the continued support with your retest acres.



Happy Birthday, John Hackerson



March 10th, John Hackerson celebrated his 86th birthday. John now lives in Moline, Illinois and is enjoying his retirement. His overall health is good, but he has lost about 90% of his eyesight. He remains very

active and teaches a bible study class at his church.

John enjoys hearing from our clients. So if you want to cheer him up, give him a call or send him a card. His phone number is (309) 736-

1374. His address is 3810 26th Avenue, Apartment 5; Moline, IL 61265.

John and Don were the co-founders of Pro-Ag Consulting®, LLC.

Balancing Soil Fertility

When we first started the Pro-Ag crop management program 30 years ago, we did so by talking about balancing soil fertility and having a one to eight ratio of Phosphate to Potassium.

When asked to explain the 1:8 ratio, we simply referred to the University of Illinois Agronomy Handbook, first published in 1955 while I was a student and it gave us that information. No, you could not find a section that said have your soil in a one to eight ratio. But, if you looked at the fertility response charts, they told you, you would get maximum response for corn and beans by having your soil test levels at 35-50 pounds per acre for phosphorus and 275-375 pounds per acre for potassium. If you divide the phosphorus level into the potassium level, you will see that it goes eight times. Thus, we called it the 1:8 ratio.

Is it still true today? Most certainly! Year after year, the best yields we see are from fields that start the crop year with a balance of phosphorus to potassium. Correct balance of fertility is as important to corn and beans as correct nutrition is to feeding livestock. Balanced nutrition fights off disease and helps offset the effects of inclement weather including rainfall.

Start With A Good Soil Test

To know your nutrition levels in your field, a good soil test is a way to start. This becomes your beginning inventory. If your phosphate inventory is adequate or a little bit high, you will not get an economic return by applying more phosphorus. In fact, we have seen many fields actually suffer yield decreases during stressful growing seasons because of excessive application of phosphorus actually tied up needed nutrients like zinc.

Some Fields Are Naturally Short On Potash

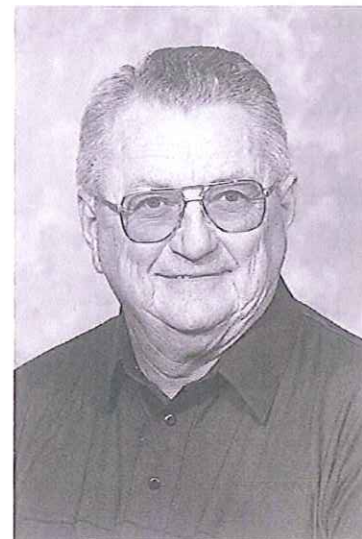
Many fields in Illinois cannot release or hold adequate levels of potassium. The silt-loam soils have very low potassium holding capabilities; therefore extra potash has to be applied almost annually to maintain test weight in grain and to give the plant health to protect itself from disease such as stalk rot.

In 1994 when stalk rot was so rampant in Iowa, Iowa State University surveyed hundreds of fields and found stalk rot was almost non-existent in corn fields where potassium levels exceeded 400 pounds per acre.

We are sampling a few fields that have been in CRP for the last 10-13 years. We have said if soils are left undisturbed and left to release nutrients by weathering the minerals and making them water soluble, we will find most Illinois soils will have a 1:8 or 1:10 ratio of phosphorus to potassium. What happens when we plant that old pasture or CRP ground to crops? It usually is one of our better producing fields!

About 8 of 10 garden samples we receive, we are told the garden does not grow much anymore. They usually admit to spreading a little extra fertilizer so they can have a good garden. The results are always the same. Too much, too much! Phosphorus and potash are at such high levels that they are out of balance and toxic to the growing plants.

It does not take a lot of phosphorus and potassium to raise a bumper crop. But, they must be in the correct proportions. Applying nutrients only when our soil test shows we need it and can get an economic return from our investment is the wisest decision to make. It is not only wise by providing better growing conditions for our crops, it also improves your net profit and that is what we are striving to improve.



Gypsum

I know a lot of you have heard about farmers using gypsum on their fields for the last few years. There have been some positive results from its use. We are getting more and more samples brought into our laboratory for testing the contents. I will share with you what we know about gypsum and its use.

Oldest Fertilizer Known

The use of gypsum has been reported as far back as 700-800 A.D. It was used as a soil conditioner first and then its nutrient value was discovered and the use spread rapidly.

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Use in North America was first reported in the 1800 to 1900 era as a very good fertilizer to use on wheat crops in the plain states (especially in North and South Dakota). The sulfur content of gypsum was the biggest advantage to its use.

What is Gypsum and Its Uses

Gypsum is a mined mineral that is mined in the Northeast, Central states (Indiana) and in many states in the West and Southwest. It is almost like a powder or flour which makes for difficulty in spreading.

Most common use is in the manufacturing of Wallboard and water treatment plants. Smaller uses occur in manufacturing and chemical plants. And, of course, the agriculture industry has greatly increased its use as well. The by-product of water treatment plants has become a very important source for the farm use.

Chemical Analysis

Gypsum is often referred to as calcium sulfate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$). One ton contains about 400 pounds of calcium and 360 pounds of sulfur in the sulfate (SO_4) form.

How Does Gypsum Work For You

Once it is applied to the soil, it first works as a soil amendment. Mixed with soil, it pulls together small particles to make larger particles. It creates porous spaces for water, air and plant roots. It will remove sodium and replace it with calcium. The sulfur in the sulfate form (SO_4) is released for much needed crop use. With better soil condition, plant's roots can access nitrogen, iron and zinc when plants are young.

Application Rates For Gypsum

An average application rate for good quality:

- Silt Clay Loam soils—1 Ton/Acre once every 2 years.
- Heavier soils that are light—2 Tons/Acre once every 2 years.
- Soils heavy in sodium—5 Tons/Acre once every 3 years.

Beware—Some companies are recommending 10-13 Tons/Acre. BE CAREFUL!

Gypsum Affect on Soil pH

Despite what has been printed in some articles, gypsum does not affect your soil pH. It has high amounts of calcium (Ca), but contains no calcium carbonate (CaCO_3). Hydrogen ions in the soil makes it acid. The more hydrogen, the lower the pH is of the soil. When limestone is applied, the calcium carbonate (CaCO_3) reacts with the hydrogen and displaces it on the clay colloid. The end result, Hydrogen is gone and the soil pH increases. Calcium alone cannot do this.

Gypsum Costs

Costs will vary with trucking costs. If you buy gypsum from the mine in Southern Indiana, expect to pay a pretty good freight cost. If you buy from a local source (water treatment plant) you will probably save money in trucking.

Average cost we have found locally is \$20-\$25 per ton spread. Spreading is usually higher because of its light weight, meaning a more narrow spread pattern.

Best Time To Spread

Since gypsum contains valuable sulfur in the sulfate form, the sulfur is subject to leaching just like nitrogen. Applying in the fall of the year, you could lose most of the sulfur. So first your applications are best done in the late spring. After applying, work the ground to incorporate the product.

Test Plots

If you would like to be part of our test plot program on gypsum and sulfur, call Don Hackerson at our Windsor Office: 1-800-879-2297.

From our Agronomists...



Jason Boerngen

Drop in Potash Levels

As many of you may have noticed, potash levels dropped dramatically on soil tests taken last fall. Most of the blame can be given to the dry fall we had, which was a blessing to most following the hard fought Fall of 2009. Most of the area I cover only had about an inch of rain in a span of four months. Here is an example of what can happen: If we harvest 150 bu/A corn, we remove approximately 160 units of K2O. Only 25-30% of this is removed from the grain. That leaves about 120 units of K2O in the residues left in the field. Without rainfall, the K2O will remain in the residues until rainfall washes it into the soil where it is available to pick up on soil tests. 120 units of K2O would be equivalent to 200# of potash (0-0-60) which would add 30 points to your soil tests. Farms tested following corn were more noticeable because there is less K2O in soybean residue. With all the snow and ice from this active winter, potassium tests should be back to normal and available to next years crop.



Ted Huber

CSP Program

I dislike government programs as much as anyone, but one program that I have many customers using with a lot of success is the CSP program (Conservation Security Program). It started around 2005 in selected watersheds only, such as the Wabash Valley watershed in east central Illinois and west central Indiana. This was a very lucrative program that many farmers took advantage of under a 10 year commitment. What I liked about this program was it rewarded farmers for conservation practices that they were already doing. However, financing ran out for this program in 2007 and a remodeled program was began in 2008 called the Conservation Stewardship Program. The new CSP program is available to any farmer in the United States with a continuous sign up. Again, this program rewards farmers for maintaining existing conservation programs as well as implementing new ones. Some of the enhancements that some of my customers have started doing are limiting phosphate applications by VRT fertilizer applications and stalk nitrate testing and tissue testing to show that N is not being over-applied. In summary, I would highly recommend anyone interested in conservation to contact your local county NRCS office to get more information about the CSP program.



Chris Behl

Rescue Nitrogen Applications

In the 2010 crop season, yellow-green or pale green corn wasn't a pleasing site. It never is. But what can we do about it? The planting in April got off to a great start and in late May in western and central Illinois, the rains came. These heavy rain events proved to be costly. Well above average rainfall on fields with low-lying sections and unusual high water tables led to ponding and huge nitrogen deficiency.

In most cases there was adequate nitrogen applied but when the heavy rains occurred, the corn plants roots weren't properly developed and were sitting in waterlogged soils. The roots really had no reason to grow. The soil just needed to dry out and get some GDU's. As for the patches in the fields, the question then is how to apply nitrogen to the deficient areas and save this crop. The sooner you apply nitrogen the better the response can be. When the corn plant's roots can begin to redevelop, any nitrogen whether still in the ground or applied can be utilized by the plant and increase yield until silking. Corn yield is very responsive to N, so when N deficiencies of corn are suspected, rescue applications have a high chance of being profitable. The amount of yield recovered may depend on the stage at which N is applied.

In western Illinois, we had clients using ground applicators and applying VRT applications by using observations. Simply driving to the deficient areas and applying. Now, some parts of these fields never dried out for ground applications to be effective, so airplanes were used. Aerial applicators were using pilot desecration and providing GPS VRT maps. In most cases this was effective; in some however, was a waste of time and money. Where the soils dried out and the roots had the

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Nitrogen forms recommended are UAN or Urea. UAN needs to be used with high-clearance injection or dribble, not in a broadcast application because of canopy injury. Urea is a good choice for broadcast and make sure to use an inhibitor such as NBPT (Agrotain). We saw agronomic results with this potion in the right situations.

Scholarship Application

Last year was the first year we failed to receive an application for our Jim Koester Memorial Scholarship. So this year, if we have the applications, we will be awarding two scholarships instead of just one.

This scholarship will be awarded to a college bound high school senior, whose parent or immediate family is a client of Pro-Ag Consulting®, LLC. The scholarship will pay \$500 each year for four years to the college or university the recipient chooses to attend.

To date, Pro-Ag Consulting®, LLC has awarded over \$26,000 in scholarship money. The scholarship program is meant to help an interested student develop his or her learning skills so they too can enjoy the benefits of a career in agriculture.

To obtain an application, call our Windsor Office at 1-800-879-2297. The application should be completed and in our office by May 31, 2011. Your Regional Manager can help you with any questions.



Rescue N Application Chart

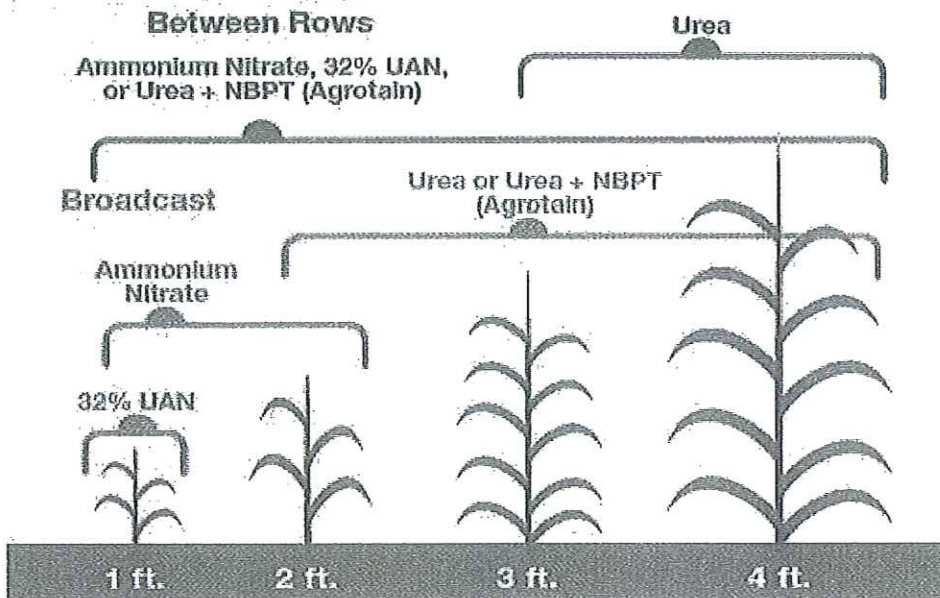


Figure 3. University of Missouri research agronomist Kelly Nelson developed this chart to show which sources of nitrogen can be used at different growth stages of corn.

Pro-Ag Goes Shopping



Each year at Christmas time the Windsor-Gays Jr. Women's Club puts out a "Giving Tree." The tree is used to hang tags for children in need. These tags contain age, clothing sizes and interests of the child. The employees of Pro-Ag decided that this year we would pick 10 children's tags off of the tree.

Chuck, Beth and Candy represented the employees for this year's shopping trip. It was a fun day with lots of shopping carts full of clothes, games, coats and miscellaneous items for the kids. We then headed back to the office for everyone to help wrap the gifts. After wrapping all of the gifts, we dropped our gifts back off at the "Giving Tree" so that Santa could deliver.

Pro-Ag is proud of our employees for their generosity and we are making this an annual event.

For Years It Has Been N-P-K Now it is N-P-K-S S = Sulfur

Sulfur is a key part of any good fertilizer program. Sulfur is becoming increasingly important as a fertilizer nutrient and as a factor in high yields. A grower should look long and hard at his fertilizer program in order to decide whether it should be included. Soil test results, plant analysis, visual inspection of crops and yield responses for each year should all be considered as part of the program. If factors indicate the need for sulfur, it should be included in the grower's fertilization program.

Sulfur is found in relatively small amounts in soil. In humid regions, organic matter is the primary source of sulfur to plants. The organic sulfur is converted to sulfate sulfur by soil bacteria when environmental conditions favor the decomposition of the organic matter. This biological transformation largely governs the amount of available sulfur in soils. The sulfur cycle is very similar to the processes in the soil which convert organic nitrogen into the available ammonium and nitrate nitrogen.

Like nitrogen, sulfate sulfur may be converted into unavailable forms, or lost into the atmosphere as sulfur gases in water-logged soils. Although not as readily leached as nitrate, sulfate is not held by the soil and may be removed from it under conditions of high rainfall or excessive irrigation. Soils where deficiencies are most frequently found are sandy soils that are highly leached and low in organic matter, and heavily eroded soils.

Until recently, sulfur has been supplied in various ways as a by-product. Many of these sources of supply have ceased to exist. Consider the following:

- We are now entering a period in crop production when sulfur must be added as a plant nutrient in order to achieve maximum efficient production. Why do we need Sulfur?
- Without sulfur, crops cannot use nitrogen.

Crop Requirements

Crops differ in their requirements for sulfur. Those requiring high amounts of added nitrogen and legumes are more susceptible to sulfur deficiency. The sulfur requirements of certain crops compared with their requirements for nitrogen, phosphorus and potassium are shown in the table on the next page.

This table shows that the phosphorus-to-sulfur ratio of many of the crops is about one to one. If both sulfur and phosphorus are applied in the fertilizer, the plant is able to make better use of the applied sulfur than of the phosphorus. Thus, if we use a phosphorus-to-sulfur ratio of 1.3:1 as a general guideline and convert to P_2O_5 , we obtain a general ratio that can be used on sulfur deficient soils. This means that for every 3 pounds of P_2O_5 applied on sulfur-deficient soils, one pound of elemental sulfur or its equivalent, could be applied.

A relationship can be established for crop requirements of nitrogen and sulfur; however, these ratios vary widely among different crops. On soils which are sulfur-deficient, but not phosphorus-deficient, the application of one pound of sulfur for each five or 10 pounds of nitrogen would be a general guideline.

These general ratios should be used only where the amounts of nitrogen and phosphorus applied are in the general order of the crop's requirement, or not enough sulfur will be applied. Sulfur must be replaced every year.

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Pounds*					
Crop	Yield/Acre	Sulfur	Nitrogen	Phosphorus	Potassium
Corn	250 bu	45-55	275	65	275
Wheat	80 bu	18-24	170	30	100
Alfalfa	10 tons	50-60	300	50	400
Clovers	5 tons	25-30	250	22	165
Grasses	6 tons	20-35	180	27	150
* Expressed as elemental sulfur, nitrogen, phosphorus, and potassium.					

Yields Will Increase

Research has shown that the use of sulfur has increased crop yields.

Corn: A 5% to 27% increase in the Midwest; 32% increase in Minnesota; 25% increase in Nebraska.

Wheat: An average of 16% yield increase was obtained on wheat in Texas; a 60% increase in the western states.

Alfalfa: A 78% increase in the western states; 30% to 80% increase in the Midwest.

Soybeans: An 11% increase.

Legumes: A 51% increase in Washington and Oregon; a 49% increase in the Midwest; a 97% increase in California.

Foliar Application Best

Most of the above discussion has been directed to the use of sulfur as a soil applied material which must be oxidized by soil bacteria to sulfate sulfur for plant uptake.

Applying oxidized sulfur is a relatively new area of sulfur use as a water soluble non-acidifying, essential nutrient. This new and exciting work is primarily directed to the use of oxidized sulfur— $\text{SO}_4\text{-S}$ as a foliar applied material.

Many years of field application experience has exhibited the ability of foliar applied sulfur $\text{SO}_4\text{-S}$ to greatly affect the physiology of a growing plant. This is primarily due to the high phloem mobility and reduced form of sulfate sulfur, that allows for immediate plant utilization without a conversion reduction step.

Field trial observation and results show and increase in chlorophyll formation. After applying sulfur, the plants immediately turned darker green. It is thought that this happens because of the increased solubility of iron in the plant leaf where sulfur is applied.

Soil Analysis

Soil tests for available sulfur are fairly reliable, but not as precise as soil tests for phosphorus or potassium. The problems occur because sulfate is mobile in the soil and can be lost because of leaching during the growing season. Also, since sulfur is released from organic matter decomposition, environmental factors which affect this decomposition can also change the sulfur availability. Research is in progress in many areas to improve the correlation between sulfur soil test levels and crop response.

Plant Analysis

The level of sulfur in plant tissue can be measured by laboratory analysis. By matching the amount of sulfur in the plant with yield response, a useful and important diagnostic tool can be developed. The guidelines for required levels of sulfur in various crops have been established.

When a sulfur deficiency has been diagnosed, then correction is the next problem. Sulfur is available in various forms of fertilizer materials. If immediate response is needed, then sulfur should be applied in a sulfate form. If the applied sulfur is in the elemental form, it must undergo bacterial oxidation to sulfate sulfur before it is available to the plant.

Chris Behl
Bloomington, IL 888-879-2297

Ted Huber
Oakland, IL 888-305-4411

Jason Boerngen
Montrose, IL 888-732-2530

Matt Schilling
Dahlgren, IL 618-925-1566

Gary Frye
Hull, IL 217-656-3474

New Pro-Ag Employees

Lex Bryant



Lex came to work at Pro-Ag during his Senior year at Windsor High School. Upon graduation, he worked full time in our soil room as well as working in the field as a soil technician. He enjoys the travel and working in the outdoors. He currently is working part-time while he attends Lake Land College. Lex plans to have a career as an electrician after completing college.

David Bowling



David started with Pro-Ag in April of 2008 grinding soil in our laboratory. This past year, he also worked with our field crew taking soil samples in various parts of the state. David is a full-time employee but plans to attend Lake Land College in the fall. He plans to get a degree in Ag Production.

An Employee Owned Company

With Over 234 Years of Experience

Don Hackerson	Co-Owner	26 Years
Gary Frye	Regional Manager	29 Years
Jim Molock	Shop Manager	23 Years
Chris Behl	Regional Manager/ Co-Owner	22 Years
Gail Molock	Lab Manager	21 Years
Ted Huber	Regional Manager/ Co-Owner	16 Years
Jason Boerngen	Regional Manager/ Co-Owner	14 Years
Matt Schilling	Regional Manager/ Co-Owner	13 Years
Marilyn Nelson	Lab Assistant	12 Years
Charlotte Newman	Lab Assistant	11 Years
Kurt Storm	Soil Technician	9 Years
Charles Campbell	Controller/Co-Owner	8 Years
Tish Behl	Mapping Manager	7 Years
Ryan Parker	Soil Technician	5 Years
Beth Kull	Mapping Assistant	4 Years
Cindy Fallert	Lab Assistant	4 Years
Bryant Tingley	Regional Manager Trainee	3 Years
Candy Waggoner	Mapping Assistant	3 Years
Dustin Parker	Soil Technician	2 Years
David Bowling	Soil Technician	1 Year
Lex Bryant	Soil Technician	1 Year