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The Growers Solution

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VOLUME 21 ISSUE 1

Nitrogen, The Hot Topic — Again

By Jim Halbeisen

As fertilizer prices have increased right along with the prices of commodities, farmers are aware input prices could eat up potential profits. Nitrogen (N) is the fertilizer element scoring the highest for price increases. In the Winter 2006 edition of *The Growers Solution* we suggested target fertility applications of Growers Mineral Solutions (GMS) could be an economical substitute for nitrogen as prices were starting to rise. Since then the nitrogen cost problem has only worsened. In fact, corn fertilizer prices may send many operations scrambling back to more soy-

beans or a wheat/soybean double crop situation. For strict row croppers a crop switch is a possibility, but even those who want to maintain some form of crop rotation will have to contain corn fertilizer costs. Many livestock operations will still need corn for feed so they, too, will need to address the cost issue.

During the summer of 2007 nitrogen was discussed in the agricultural press to very great lengths.

1. Growers Chemical Corporation for years has been warning farmers about the environmental problems of over applying nitrogen to grasses, especially corn. Reports from Washington, D. C. in July of 2007, contend higher corn prices are contributing to an increase in the size of the Dead Zone in the Gulf of Mexico, the third largest since 1985, as

measured by Louisiana University's Marine Consortium. The Dead Zone was a political problem until the Republicans came into power, and it may again come to the forefront should the Democrats regain the White House.

2. Ohio State University Extension in September told about a nitrogen rate calculator which is supposed to help farmers manage their nitrogen inputs. The extension says the goal is to apply the minimum nitrogen needed for maximum yield results, thereby saving farmers money on fertilizer applications.

Robert Mullen, Ohio State University Extension Fertility Specialist, says, "The tool is part of a new nitrogen application program slowly replacing old recommendations that based fertilizer inputs on yield potential. That

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Seed Zone pH Problems?

By Jim Halbeisen

During this past summer, 2007, various Farm Progress state publications (Ohio Farmer, Prairie Farmer, etc.) carried an article entitled "Low pH Soils Snatch More Yield". The article says low pH levels in surface soils can have very severe impacts on plant germination and the growth of young plants. According to the Certified Crop Advisors (CCA) consulted for the article, it seems the problem is increasing significantly throughout the corn and soybean cropping areas.

We at Growers Chemical Corporation feel this is a direct result of using excessively high rates of nitrogen fertilizer, on corn especially. Nitrogen not used by the plant is either lost to the environment as pollution, or it stays in the soil creating nitric acid and lowering pH. After several years of applying insurance (more than

needed or used) nitrogen, the soil surface will increase in acidity. Plant physiology textbooks tell us low pH toxicity reduces nutrient uptake and thus the plant's ability to use available nutrients. A larger and closely related, but rarely recognized problem is that aluminum (Al) becomes soluble and very toxic to the plant root with lower pHs.

The crop advisors quoted in the article say the best way to solve the low pH problem is to apply limestone. The situation is most severe on rented land, but, like most farmers and crop advisors, neither the landlords nor the tenants think they can justify spending the money on the solution.

Some experts have tried satisfying the expense issue with quick fixes; like banding a few hundred pounds of limestone per acre over the row with the planter. Their experiments had

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This is the sixth and concluding segment of an entertaining story by our long time good friend, Sam Niblett of Easton, Maine, describing his tortuous introduction into raising potatoes. Although written in 1981, his message is relevant and timely today as he encourages us all to seek and discover better farming ways.

Soils, Their Use, Abuse and Restoration

By Sam Niblett

It is that simple. Oxidation is the key to farming. If it is there it is helping, or, if not, it is hurting. Oxygen is the key to root development, and calcium creates the physical conditions allowing oxygen to penetrate the soil's lower reaches where big yields can develop.

Man's job is to prevent interfering influences, not to compound the problem as he has done of late.

We can either throw huge amounts of N,P&K at our soils and try to beat them into submission, or we can add enough calcium (and it takes a lot in some cases — a plow acre 6 2/3 inches deep weighs about 2,000,000 pounds or 1,000 tons — so good luck!) to counteract the abuses of the past 20 or 30 years and thus let our soils do the jobs they were created to do.

As was stated earlier, "The profoundest of truths are spoken with a whisper." The time is fast approaching when the quantity of food produced on an acre of land will be reduced to the same extent that the quality has already deteriorated. Rather than eating empty calories as we do now, we may also have empty stomachs besides.

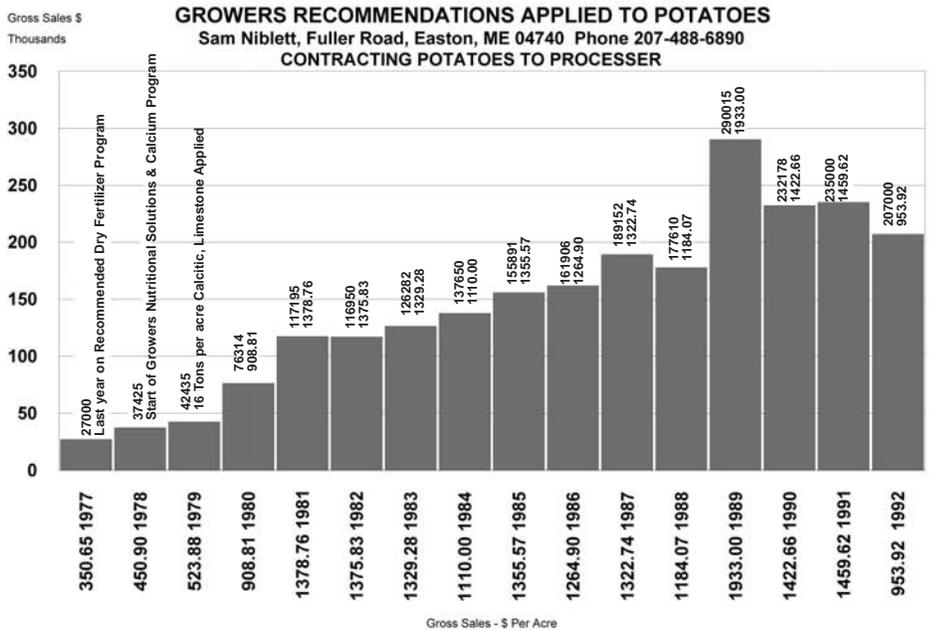
Continuing our research through 1981, Wilbur and I dug samples that showed yields as high as 281 to 290 barrels per acre. This is not an average, but if we can do it in some places in a field, then why not the entire field? Wilbur says, "We have done the easy part so far. Things get tougher from now on."

Every year in December, Growers Chemical Corp. holds a meeting in Milan, Ohio, and farmers and dealers from all over the country get together and tell of situations similar to mine. Whether it is rice in Louisiana, tobacco in North Carolina, corn in Illinois, alfalfa in Minnesota or potatoes in Maine, the common thread running through these diverse situations in diverse sections of the country raised by diverse individuals, is that they dared to be different. They "bucked the establishment" and decided to "ruin an acre" by applying 10, 12, 18 or 20 tons of high calcium limestone to achieve 85% base saturation of the soil colloid on whatever soil type that they happened to be farming.

The water, air and sunlight are free, and soils will react to them each according to their physical condition. pH adjustment may help and rotation may help, but if there is one thing that

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The following page from our 1999 Results Book shows that Sam did achieve his potato growing goals, and in his 1993 note, Wilbur Franklin explains subsequent events.



Sam Niblett of Easton, Maine met Wilbur Franklin and began learning about the Growers Program in 1977. In 1978, he began using Growers Mineral Solutions. He applied 16 tons of calclitic limestone per acre to all of his land in 1978 and 1979. The graph above shows Sam's success in following the Growers Program.

In 1993, when Sam discovered his wife, Peggy, had leukemia, he rented out their farms. This allowed them to devote full time seeking cures at home and abroad. Fortunately, that mission has proved to be about 100% successful.

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Meanwhile, Sam was happy to discover his farms brought a substantial 50% rent premium over the local going rate. This, apparently, because they had been so exceptionally productive for potatoes following liming according to the Growers soil test.

Sam went back to farming and raised quality alfalfa, getting premiums for it from a specialty feed producer. He visited with the Growers family in December 2002 and said he couldn't resist when a corporation came along and offered him a good price for the whole setup, except the house, barn and 37 acres. Not a bad story of the Growers Program in today's farm economy.

Greenhouse Grower is Customer For Life

Situated in Frostburg at the far western end of Maryland, overflowing with colorful exuberance from the renovated blue Victorian style building, Harvey's Florist and Greenhouses specializes in everything botanical, from custom designed arrangements, to handmade Tiffany lamps, to beautiful fresh seasonal plants.

Bernie Miltenberger is the head grower at Harvey's, and he has his hands full juggling the demands of three large greenhouses, seasonal customer needs, weddings, tours and catered dinners. He uses Growers Mineral Solutions in the greenhouses at a rate of two cups per 5 gallon mix injected in the watering system at a 100:1 ratio. "The plants love Growers," enthused Bernie.

To fully appreciate the health and vigor of his plants, one must check our Harvey's Web site at www.harveysflorist.com and click on "greenhouses." The photos of the rows of red poinsettias are particularly striking. Troubles with his poinsettias caused Bernie to give Growers a try.

"Several years ago," remembers Bernie, "I met one of your representatives at Penn State

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Poinsettias at Harvey's Florist and Greenhouse, Frostburg, Maryland.



"Thank you Growers. I am a customer for life."

Soils, Their Use, Abuse and Restoration

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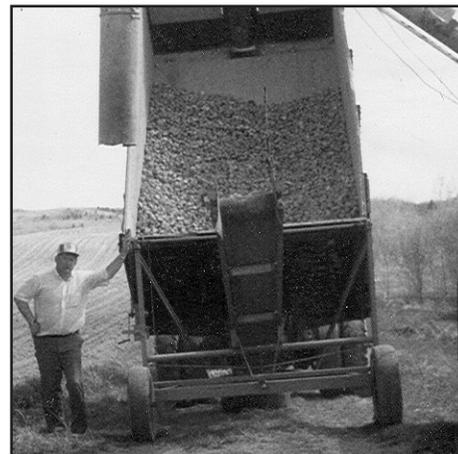
and rotation may help, but if there is one thing that the average farmer can do without huge capital outlay, it is to apply three things to his

soil. They are calcium, calcium and calcium.

We will live with it and die without it. Call it what you will; the policeman of the soil, the prince of nutrients, white gold or a variety of less flattering names. Unfortunately, calcium's importance has escaped some of the most sophisticated laboratories in the country, yet over a century ago poorly equipped European chemists understood its beneficial functions.

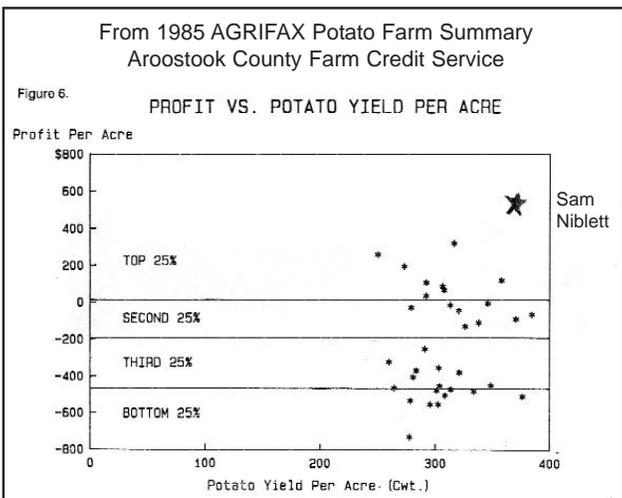
Not many get rich selling limestone, and perhaps this is why it has not been promoted more thoroughly. It is as common as dirt, yet cruelly out of reach only inches below the root zones of our once most fertile soils.

Indeed, "The profoundest of



Sam Niblett of Easton, Maine.

truths are spoken with a whisper." He who has ears to hear, let him hear. ■



Feeding Correctly vs. The Problematic

By Dr. Tom Swerczek

The recent problems associated with the contamination and adulteration of pet foods has alerted the American public to the problems associated with toxic agents in pet food and livestock feed ingredients. Although these problems are not new, many were shocked of the extent suppliers have gone to deceive. It is likely they were on the market for years, but the massive outcry initiated the examination of lead paint in toys and to recalls. Hopefully, the American public will now demand a search for the toxic ingredients that for years have been plaguing the food, feed and fertilizer industries.

As early as the mid-1990s livestock as well as pets were affected with a severe mineral imbalance associated with heavy metals, primarily cadmium, in feed and mineral ingredients. Some, but not all, feed ingredients with melamine and co-contaminants cyanuric acid and ammeline in adulterated wheat gluten and rice protein concentrates originated from China. Zinc sulfate from China, highly contaminated with cadmium, is one of the major minerals used in livestock mineral supplements and made its way into numerous minerals. Additionally, cadmium is also found in rock phosphates used in fertilizers and minerals for pets and livestock. Products like dicalcium phosphate naturally contain varying levels of cadmium and will induce a mineral imbalance. Other phosphorus products derived from rock phosphates may also be contaminated with cadmium if not purified. Cadmium in high levels will induce toxicity in the kidneys and bones. However, even low levels of cadmium will induce a mineral imbalance by tying up other minerals and trace elements, primary copper, which induces a copper deficiency. Cadmium may also affect numerous enzyme systems important for physiological pathways. Because cadmium contamination is inducing a copper deficiency in affected livestock, additional copper is being added to rations, but this will not neutralize cadmium toxicity. Too much copper may be very toxic, and like a copper deficiency, may induce an immune suppression.

To encourage livestock to consume more minerals, the industry has limited salt, sodium chloride, in mineral supplements and this has led to the over consumption of essential minerals, normally not toxic if fed at correct levels, but can be if fed in excessive amounts. An example, the over feeding of magnesium may result in decreased performance, especially milk production in dairy cows and severe reduction of calf weights in calves on beef cows. Furthermore, the overfeeding minerals

contaminated with heavy metals have a drastic effect on immune suppression and the induction of a host of opportunistic diseases.

While studying the drastic effect of overfeeding minerals and toxic heavy metals, the importance of an adequate amount of sodium for livestock became very apparent. It was found that a deficiency of sodium, high levels of potassium and low levels of calcium seemingly induce a mineral imbalance that resulted in hypomagnesemia and hypocalcemia in cattle, primarily in cattle grazing on lush spring and

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fall pastures highly fertilized with potassium and nitrogen fertilizers, or pasture grasses with legumes. It was observed these imbalances affecting pasture forages were high in potassium nitrate and were more likely to occur after drastic changes in weather conditions like frosts and freezes, and cattle were more likely to be affected with hypomagnesemia and hypocalcemia.

Therefore, it is hypothesized that if there is a deficiency of sodium, and most forages and rations are deficient in sodium and excessive in potassium, and when there is a spike in nitrate, or excessive nitrate in the body, nitrate is eliminated from the body as magnesium nitrate and/or calcium nitrate depending on the concentrations of each. However, if there is adequate sodium in the diet and body, the excessive nitrate is removed by the gut and kidneys as sodium nitrate and the magnesium and calcium cations are maintained at physiologic levels and a hypomagnesemia or hypocalcemia will not occur. For this reason adequate levels of sodium in the body and ration will lessen or prevent the drastic effects of nitrate toxicity. Also, it explains why adequate sodium in the diet will lessen or prevent grass tetany, which is associated with high potassium and low magnesium

levels. It further explains why the grass tetany syndrome cannot be readily induced experimentally until cattle are exposed to high nitrogen or nitrate forages.

The reason why nitrate has not been recognized as a major problem in herbivores is due to inadequate testing procedures showing false negative results for the analysis of nitrate in forages and especially in biological fluids. Excessive nitrate can be induced endogenously by bacteria within the gut of herbivores if they are on a high nitrogen diet, which may come from high protein sources, but also from non-protein nitrogenous sources such as urea, ammonium compounds, by-products such as corn gluten or wheat gluten which may contain excessive non-protein nitrogenous compounds, either naturally, or intentionally adulterated to falsely elevate the "protein" content of supplements.

However, the endogenously produced nitrate in herbivores on high protein and non-protein nitrogenous diets are not considered, but should be, when determining the amount of nitrate the forages contain and the additive toxic effects the endogenously produced nitrate has when combined with the exogenously produced nitrate found in pasture forages. It was found with numerous field observations, not only with the grass tetany syndrome, the excessive nitrates that are produced endogenously in the gut, or exogenously in forages, that adequate sodium in the diet, either in the form of sodium chloride and/or sodium bicarbonate seemingly will neutralize the excessive nitrate and possibly other non-protein nitrogenous compounds in the body by excreting them in the urine as sodium nitrate. Also, other products like high sodium clays and zeolytes seemingly will absorb the excessive nitrate and other non-protein nitrogenous compounds and excrete them in the feces. This is a significant finding as the excessive non-protein nitrogenous compounds are not only inducing mineral and metabolic imbalances, but also affecting the immune system causing an immune suppression. The end results are numerous opportunistic diseases of the gastrointestinal and respiratory tracts, including E. coli, salmonellosis, pastorellosis and others.

This explains why adequate sodium in the diet, in the form of sodium chloride, or sodium bicarbonate, seemingly will protect cattle against grass tetany, or hypomagnesemia and hypocalcemia, if animals are exposed to high potassium and nitrate rations. Also, these products along with high sodium clays and zeolytes

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Feed Ingredient Problems

By Jim Halbeisen

Since the beginning in 1955, Growers Chemical Corporation has recommended to livestock farmers they raise, as much as possible, their own livestock feed ingredients. Early on, and after many years of research, Dr. V. A. Tiedjens was convinced crop quality was being compromised by the agricultural establishment's fertility treatments, and he urged farmers to raise their own feed. That advice has been born out many times over by way of on farm feed quality comparisons.

But now toxicity problems in the pet food industry, and even the food for human consumption, adds another dimension to procuring livestock feed. In March 2007, pet food manufactured in Canada was blamed for killing more than 4,000 cats and dogs, which resulted in a massive recall and an investigation into that feed. At first the FDA found traces of aminopterin, rat poison, in the feed. Upon further investigation, the compound melamine seemed to be the real problem. The melamine, a relative to urea, was traced to wheat gluten being used in the pet food. As the investigation continued, another chemical compound, cyanuric acid, a high nitrogen compound, was also detected. So both chemicals, melamine and cyanuric acid, were ingredients in the pet food. Originally, wheat gluten was said to contain the chemicals, but then rice protein and wheat flour were also found to be contaminated.

The animals' causes of death seem to be related to the kidneys. The latest diagnosis centers around the crystal formation in an interaction between melamine and cyanuric acid, and these crystals, according to the theory, were responsible for damaging the affected animals' kidneys.

Why are the chemicals melamine and cyanuric acid in the pet food ingredients wheat gluten, rice protein, or wheat flour in the first

place? They are added as "quality enhancers" to improve the protein readings in these products. They have no nutritional value, but they are cheap, much cheaper than the beneficial ingredients they replace.

Feed ingredients are measured for crude protein content using the "kjeldahl test." Actually, the kjeldahl test determines the percentage of nitrogen in a sample, and the feed industry relates this to protein. They assume so much nitrogen is present in the chemical content of

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amino acids (building blocks of protein), so using a calculation factor, they estimate the amount of possible protein in a feed source by analyzing its nitrogen content. The protein thus found in the sample is really a "guesstimation" which may be why it is called the percentage of "crude" protein.

Advocates of the kjeldahl test have said true protein should be higher as the crude protein test goes higher. This nitrogen and crude protein relationship has been embraced by the ruminant livestock industry for years. When the ruminant nutritionists said the increased nitrogen levels would be used by the rumen biology and the addition was very similar to an increase in protein content, livestock farmers injected anhydrous ammonia or urea into corn silage to increase its protein (crude protein). However, these became toxic to the animal and problems

arose when too much was added to the feed.

As the pet food investigation expanded, the protein additives used were found to have originated in China. FDA questioned the Chinese about the practice of spiking ingredients with high nitrogen compounds to increase protein values, and they freely admitted to the practice, "because everyone is doing it." They contend, and it is true, it is not unusual for companies in the pet food, livestock feed, and even the human food business to spike protein ingredients. By the time FDA traveled to China to investigate, the two companies of concern had been dismantled with no officials to question. The Chinese contend they are going to "crack down" on illegal feed handling practices, but critics say the government response is mostly rhetorical.

This is the new dimension of livestock feeding that has evolved in agriculture the world over. When we advocate producers raise the highest quality feeds possible by way of their own operations, it allows them the luxury of not having to worry about ingredients of unknown origins. Growers Chemical Corporation has, and continues, to deal with heavy metal and other toxicity problems in both mineral and fertilizer raw materials originating from local and world markets, including the Chinese, so "we have been there and know that" about the low cost ingredients being offered.

The toxic results of the "low cost approach" may not be immediately apparent, but its long term effect, we believe, will eventually express itself in the poorer quality of both livestock feed and soil fertility. The better the feed raised by the livestock operation itself, the less susceptible it is to bringing in harmful ingredients. This is even more relevant today than when Dr. Tiedjens first discussed it 50 years ago. Just ask Mattel Inc. about that. ■

Feeding Correctly

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hypocalcemia, if animals are exposed to high potassium and nitrate rations. Also, these products along with high sodium clays and zeolites seemingly allow the feeding of higher levels of protein supplements as well as high "protein" by-products such as corn gluten that may contain non-protein nitrogenous compounds, such as urea, and other non-protein nitrogenous compounds. It appears that the low calcium and high potassium and nitrogen forages and diets are having massive detrimental effects on livestock production as well as reproductive losses

in herbivores.

These mineral imbalances were recognized for years by the late Dr. Teidjens, who developed the Growers Program promoting the healthy growing of forages for livestock feeding. He developed Growers Mineral Solutions for foliar feeding of plants as well as the mineral supplementation of livestock. He stressed the necessity of adequate high calcium lime fertilization and trace elements for plants, minimum amounts of potassium and nitrogen, and limited amounts of non-protein nitrogenous com-

pounds in forages which may be very detrimental to the health of livestock.

Our work is based on several years of field observations and feeding trials with my brother Steve on our Nebraska family cow-calf and feed lot operations as well as feeding trials on several thousand cattle and other beef and dairy operations in Nebraska that have used the Growers Program on their grain and forage operations and livestock feeding programs. ■

Target Fertility?

By Jim Johns

What is Target Fertility? It is sort of a new buzz word or statement originated by Jim Halbeisen and further embellished by Jennie Henry.

The idea is that Growers Mineral Solutions target, or aim at, the crop. The seed is the target for the GMS Row Starter, the root of the transplanted seedling is the target for the GMS Transplant Solution and the crop foliage is the target of the GMS Foliage Spray. Each of these applications were designed to directly, efficiently and economically feed the crop during its periods of highest stress; germination and reproduction.

Conventional fertilizers cannot be targeted because they "burn" when they come in direct contact with the plant. Those products burn because they are made from low cost raw materials containing toxicities, heavy metals, high salt concentrations, etc., which plants cannot tolerate. As such, most all liquid and dry fertilizers must be broadcast, banded or set off to the

side in order to have the ground buffer their toxicities. Scattering fertilizers, rather than Targeting, reduces their efficiency or availability to the plant. Various ag universities, at one time or another, have stated only about 10 to 20% of dry fertilizers applied are used by the plant during its growing season, the other 80 or 90% goes "down the drain" or remains as toxicities.

Dry fertilizers lose additional efficiency because they must dissolve, or become liquid, to be available to and taken into the plant root. If there is no moisture, they do not dissolve. If too much water, too much dissolves and quickly drains away unused by the plant.

According to university research, a balanced liquid plant food like Growers Mineral Solutions has been shown to be 90 to 95% available and usable by the growing crop. This efficiency means much less material will satisfy crop needs. Typically, 70 pounds (about 6 gallons) per acre of GMS have been reported to out perform 300 or 400 pounds of recommended dry fertilizers.

Our customers' findings are confirmed by researchers at Michigan State University in their report on foliar feeding, "The amounts may at first seem relatively small, but to offset this handicap, the efficiency is high. In fact, this is the most efficient method of applying fertilizer to plants that we have yet discovered. If we apply these materials to the leaves in soluble forms, as much as 95 percent of what is applied may be used by the plant. If we apply a similar amount to the soil, we find about 10 percent of it to used."

Fertilizers are directly tied to energy. We are deriving more and more ethanol and biodiesel from crops so we need to cut energy usage. In today's world of high input costs and concerns about environmental pollution from heavy metals, soil erosion, carbon dioxide emissions, etc., a proven Targeting Plant Food like GMS makes a lot of sense. ■

On The Road Again — Hope To See You!

Growers Mineral Solutions is scheduled to set up and staff booths at the following upcoming farm shows and conventions this winter. It's a great time to stop in and review your plant food and animal nutrition needs,

hear about new developments at Growers or just chat with the folks who make it all happen—your friends and neighbors.

Jan. 7-10, 2008	Delaware Ag. Week Harrington, DE	Jan. 24-25	North Central Ohio Grazing Conference Wooster, OH	Feb. 13-16	National Farm Machinery Show Louisville, KY
Jan. 8-10	Keystone Farm Show York, PA	Jan 29-31	Mid Atlantic Fruit & Vegetable Hershey, PA	Feb. 21-23	New York Farm Show Syracuse, NY
Jan. 8-10	Ontario Landscape Congress Toronto, Ontario, Canada	Jan. 30-Feb. 1	Southern Farm Show Raleigh, NC	Feb. 26-28	Central Minnesota Farm Show St. Cloud, MN
Jan. 11-12	Georgia Fruit & Vegetable Show Savannah, GA	Feb. 1	Northern Indiana Grazing Conf. Shipshewana, IN	Mar. 4-6	Profesional Crop Producers Conference State College, PA
Jan. 15-16	Ohio Produce Growers Congress Sandusky, OH	Feb. 5-7	Canadian International Farm Equip Toronto, Ont., Canada	Mar. 5-6	East Central Farm Show Lindsay, Ont., Canada
Jan. 15-17	Fort Wayne Farm Show Fort Wayne, IN	Feb. 5-6	Alexandria Area Farm Show Alexandria, MN	Mar. 6-8	Western Fair Farm Show London, Ont., Canada
Jan. 15-17	Atlantic Coast Ag. Conf. Atlantic City, NJ	Feb. 13-14	Empire State Fruit & Vegetable Expo Syracuse, NY	April 1-3	Wisconsin Public Service Farm Show Oshkosh, WI
Jan. 22-24	Virginia Farm Show Fishersville, VA				

Seed Zone

Continued from page 1

the row with the planter. Their experiments had limited success mainly because they used the wrong limestone sources. They concentrated on pH adjustment with dolomite lime while ignoring the soil's need for calcium.

For years, meanwhile, many Growers Mineral Solutions (GMS) customers have profitably banded high calcium lime on ground needing lime. High calcium lime automatically elevates soil pH to proper levels which helps germination and young plant growth. High calcium limestone not only counteracts aluminum (Al) toxicities related to low soil pH levels, but calcium (Ca) is necessary to balance out certain concentrations of cations. The cation concentration factor is one reason why the CCA's use of banded limestone did not work.

From the above it is fairly obvious to us here at Growers that the establishment crop advisors

will not soon find answers to their low soil pH problems by way of high calcium limestone additions as we suggest.

We do have another option for consideration, however. Use Growers Mineral Solutions as an in-the-row starter for plants. GMS can supply all the elements to the seed zone necessary to grow the plant. By way of trace elements, GMS introduces more than just nitrogen (N), phosphorus (P), and potassium (K) into the seed zone. The chemistry of the trace elements in GMS can significantly raise the pH in the seed zone and neutralize the excess acid crop advisors are finding in surface soils.

Other starter materials, however, are not able to produce the same results because none of them believe trace elements are necessary additions to N, P and K in the seed zone. Also, other starter fertilizers, by nature, are usually

quite acidic (below 6.0 pH), so there is no possible way for them to stabilize or neutralize a low pH.

In addition, GMS introduces a proper balance of elements into the seed zone while creating an environment not toxic to germinating plants. And when element balance is achieved, as Dr. Tiedjens taught us, correct cation balance will follow.

Experience over 52 years has convinced us crop growth problems related to low pH in the seed zone can be improved or corrected using Growers Mineral Solutions as a starter in the row, and applying proper amounts of high calcium lime products to the soil. ■

Nitrogen, The Hot Topic

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is, if a grower wanted 150 bushels per acre, he would apply the maximum nitrogen needed to get those 150 bushels. However, through years of research we found no correlation between nitrogen applications and yield. That is, you eventually reach a yield ceiling and applying more nitrogen doesn't necessarily mean you'll get more yield, and it could also mean that you could apply less nitrogen to achieve the same yield."

3. In early October the Livestock Industry's National Research Council in two reports discussed agriculture's nitrogen emissions. One report stated a single molecule of ammonia or nitrous oxide once emitted to the environment can alter a wide array of biogeochemical processes, known as the "nitrogen cascade," as it is passed through various environmental reservoirs. For example, a molecule of nitrous oxide has a global warming potential 296 times that of a molecule of carbon dioxide. The problem is that world wide more than half of the losses of reactive nitrogen to the air and 70 percent of the ammonia losses are estimated to derive from agricultural production.

4. In late October an e-mail version of The Corn and Soybean Digest, Corn e-Digest, contained as the lead article "N Fertilizer Prices Likely to Balloon by Spring". Several agricultural advisors said \$600 per ton anhydrous ammonia will be a definite possibility by early 2008, and all nitrogen prices will be higher by the spring of 2008. They suggested farmers buy their nitrogen needs before spring. Also, these advisors believe nitrogen is still cheap in relation to the price of corn, so corn acres probably will not be altered by nitrogen prices.

5. The American Society of Agronomy published online on October 24, 2007, in the

Journal of Environmental Quality an article entitled "The Myth of Nitrogen Fertilization for Soil Carbon Sequestration". In it the University of Illinois soil scientists used the Morrow Plots, long term campus test plots, to evaluate how management practices have affected soil properties and yields.

Their conclusion: "A half century of synthetic N fertilization has played a crucial role in expanding worldwide grain production, but there has been a hidden cost to the soil resource: a net loss of native SOC and the residue C inputs. This cost has been exacerbated by the widespread use of yield-based systems for fertilizer N management, which are advocated for the sake of short-term economic gain rather than long-term sustainability. Fertilization beyond crop N requirements could be reduced substantially by a shift from yield- to soil-based N management, ideally implemented on a site-specific basis. This strategy may be of value for reversing the ongoing organic matter decline of arable soils, but several decades will likely be necessary before any such benefit can realistically be expected to emerge. In the meantime, caution is warranted in avoiding excessive N fertilization, and especially with the current trend toward the use of crop residues for bioenergy production."

Incidentally, one of the authors of this article, R. L. Mulvaney, was quoted in the Winter 2006 edition The Growers Solution.

6. The November 2007 issue of John Deere's publication, The Furrow, contained an article entitled the "Nitrogen Network". The article features On-Farm Network™, a farmer organization chartered by the Iowa Soybean Association in 2000. Using precision-farming tools, this group has been very aggressive in researching nitrogen rates.

Their director of research, Tracy Blackmer, the son of Alfred Blackmer (also quoted in the Winter 2006 The Growers Solution) believed the technologies of grid sampling, yield monitors, and GPS could be used to evaluate nitrogen rates to help farmers manage better and make more profits. However, after a few years trying, he came to the (GMS) conclusion, "It soon became obvious that you could collect crop yields for 20 years and still not know how to manage your N rates unless you put in test strips". Also, some of the On-Farm Network results gave credence to the ideas of Growers Chemical Corporation when one of its participating farmers stated they "were able to grow 200 bushel corn on only 60 pounds of nitrogen".

As can be seen from these recent articles, the agricultural establishment might be moving toward the position Growers has had for 50 years. That is, use crop fertility such as nitrogen at rates reflecting the potential of the environment, soil and moisture, and target your fertility to achieve maximum utilization of the input. For years Growers Chemical Corporation has said farmers could lower their nitrogen applications to grasses, but little attention was paid to this advice as long as nitrogen was priced cheaply. However, as the price of energy goes up on the world stage, the price of nitrogen now becomes a significant issue for many agricultural operations.

If nitrogen is a problem because of excesses in the crop, causes environmental degradation or lowers soil carbon levels, or if it is too high priced, contact your local GMS representative to discuss how to grow competitive yields with less applied nitrogen. ■

Growers MINERAL SOLUTIONS

WINTER 2008

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TARGET FERTILITY



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Greenhouse Grower is Customer for Life
Last Segment from Sam Niblett

Customer For Life

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Ag Progress Days. He convinced me to try Growers on the poinsettias. That year I used it as the main nutrient with intervals of some cal-mag between using Growers. A good test for poinsettia health is to pull the pot and check the root system for disease. The roots were as white and healthy as I had ever seen them. I was amazed. These poinsettias were healthy and gorgeous.”

“I have been a greenhouse

grower for 17 plus years now,” Bernie concluded. “Growers helps me cut out the use of Banrol® completely. The micro nutrients mixed in a low salt liquid NPK solution with the very least possible heavy metal toxicity is the name of the game in growing beautiful flowers. Thank you Growers. I am a customer for life.” ■



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More About Growers

We hope you will find this newsletter helpful and interesting and we welcome your input. Please send letters-to-the-editor, comments, suggestions, etc. to: Growers, P.O. Box 1750, Milan, OH 44846, call 1-800-437-4769, fax 419-499-2178.

email: growers@hmltd.net

or visit our Web site: www.growersmineral.com

Early Order Discount



It is not too late to take advantage of the Growers seasonal Cash In Advance of Delivery (CIAD) discounts which are 6% for January, 4% for February and 2% for March. Call your Growers representative for an explanation of the early order discounts, quantity pricing and delivery of Growers Mineral Solutions.

There are three ways the GMS CIAD discount can pay customers:

1. The GMS CIAD discount pays more than most savings institutions' interest, so it pays

to buy early if the cash is available.

2. The GMS CIAD discount pays more than most lending institutions' interest costs, so it pays to borrow and buy early.
3. The GMS CIAD discount results in orders being placed earlier. This allows deliveries to be more evenly spaced out, which requires less delivery equipment and helps keeps GMS prices down. ■