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## The Growers Solution

WINTER 2010

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VOLUME 23 ISSUE 1

### The Browning of the Green Revolution

By Richard Mulvaney, Saeed Khan, and Tim Ellsworth, abridged for the TGS by staff

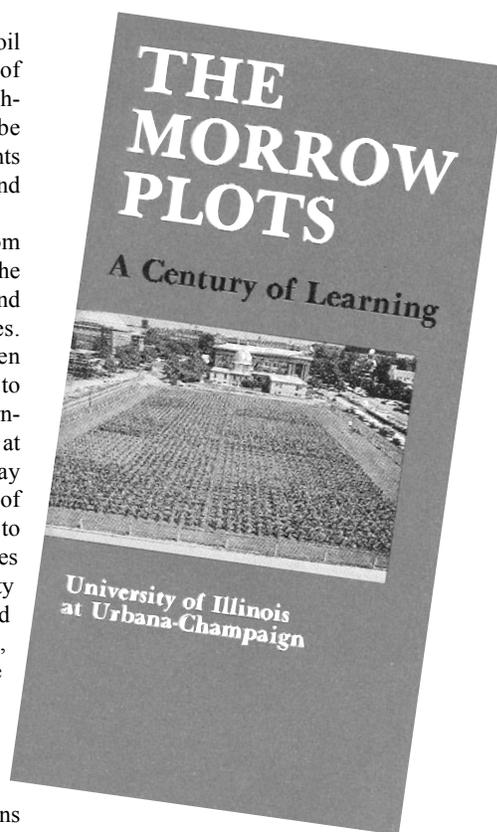
World population has doubled in a half century of the Green Revolution that tripled global cereal production by way of high-yielding varieties and large fertilizer inputs of nitrogen. Those inputs are reflected by an eightfold increase in nitrogen sales during this period, mainly for ammoniacal fertilizers produced by an energy-expensive process that runs on natural gas.

Today's intensive use of nitrogen fertilizers is widely advocated as a prerequisite for high

cereal yields, and also as a means to build soil organic matter by increasing the input of residue carbon. After several decades of high-input agriculture, the benefits should be obvious from long-term cropping experiments that provide detailed records of crop yields and soil properties.

America's oldest experimental field from 1876, the Morrow Plots represent both the original prairie soils of the Corn Belt and today's intensified production practices. Beginning in 1955, synthetic nitrogen fertilizers have been applied every year to continuous corn, in alternate years of a corn-soybean (corn-oats before 1967) rotation, or at 3-year intervals of a corn-oats-alfalfa hay rotation. Five decades later, three University of Illinois soil scientists are engaged in an effort to understand how modern cropping practices have affected soil properties and productivity at the Morrow Plots. The three, Richard Mulvaney, Saeed Khan, and Tim Ellsworth, sampled the plots to 18" in 2005. These samples and others archived since 1955 were analyzed for total nitrogen, and the results were evaluated relative to nitrogen inputs (of fertilizer) and outputs (through crop removal) estimated from fertilizer applications and yield records. The findings and their global implications are detailed in the November-December, 2009 issue of the *Journal of Environmental Quality*.

Logically, soils should gain nitrogen if fertilizer inputs exceed grain removal. In the case of the Morrow Plots, inputs ranging from 3,700 to 11,200 lb/ac over 51 years provided at least 60% more nitrogen than the corn removed, yet there was a net decline of 620 to 1600 lb/ac in total soil nitrogen relative to 1955 levels. The decline occurred even where annual fertilization of continuous corn supplied



approximately twice as much nitrogen as was removed in grain, in which case corn yields were lower than with the two rotations. The latter disparity is consistent with potentially available soil nitrogen, and demonstrates that a higher nitrogen rate cannot fully compensate for a decline in soil fertility.

The soil nitrogen decline noted for the Morrow Plots was substantiated by compiling a global database from cropping studies with a wide range of climates, soils, cropping systems,

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# The Basics of Liming and the Value of High Brix



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By Henry J. Kauffman

Understanding the basics of liming the soil is something I feel is really lacking in a lot of the farming communities. We can test the soil, but, all that is, is a guess at the most. So we have a pH of 6.9 to 7.2. We surely don't need lime with a reading like that.

Well, for the most part, we still do. The pH doesn't really tell us if we need calcium or not. What is the reaction of most fertilizer salesmen, or the co-op fertilizer man, if he sees your soil test results, and they are around 7.0? Don't apply lime, they say, or your pH will go out of sight.

High calcium calcitic lime can't make it go out of sight because it will only test at 7.1-7.2 pH pure lime.

Don't use dolomitic lime unless your C.E.C. reading is under 10%, which is very unlikely, with a lot of samples being in the 20-30% range. The magnesium in the dolomitic lime is what ties up your calcium in the soil, plus a lot of other trace minerals.

Apply high-calcium lime and it will help neutralize the magnesium in the soil, which will then release the trace minerals, plus the calcium.

Here in Minnesota, we apply a minimum of three tons per acre of high-calcium lime. We get the sugar beet lime brought in from North Dakota. The lime is free at the sugar beet plant as it is a by-product of the sugar industry.

Beet lime has about the equivalent of \$15.00 worth of N-P-K, which is derived from the beets themselves, so it is really quite a bargain. Trucking costs have really gone up, but at this time, we can have it trucked in and spread for around \$20.00 a ton, up from \$15.00 a ton three years ago.

What actually does high-calcium lime do? By neutralizing magnesium and heavy metals in the soil, the plants can absorb more energy from the sun, which in turn puts more sugar in the plant tissue.

Why do we feed corn to our dairy cows or to the beef cattle? For energy, of course. Sugar is energy, so if we use enough lime than we have healthy plants, which will make more sugar, we can get by with less corn. At the price of corn at

this time, the economics of liming are about as good as they'll get. It doesn't matter what we grow — hay, oats, or corn — is all the same. The more sugar, the more energy.

Our first year here in Minnesota, we had 150 tons of lime spread on fifty, or so, acres. They had some lime left over. We hadn't left a test strip anywhere, so we had them start spreading on one side of a corn stubble field. They spread the lime until it ran out — about four acres or so. This field was then seeded down to alfalfa the following spring.

A year after the alfalfa was seeded (which would have been eighteen months after we had applied the lime), I was out walking the fields, checking how our hay fields were doing. Over half of the fifty acres we had limed had been put into alfalfa, with picture-perfect fields at about eight inches tall. I crossed over the field where they had finished up. I was walking crossways through the field with my mind on something else, when, all of a sudden, I came to my senses again. What is wrong with this hayfield — with only about 1/2 stand, and only half as tall as what I had just come through.

I turned around, looking back. There was a drop of about four inches in the alfalfa, lengthwise through the field. Checking it out further, we found that this was where the lime had run out.

The most usual fact of alfalfa winter kill is the lack of calcium in the soil. Soils properly limed have plenty of oxygen in the soil. This allows the alfalfa to get through some very stressful periods.

By fertilizing with potassium, we make the situation worse as it tends to make the soils tight, so don't use it. Another thing with properly limed soil, your plants can easily have 50% more root mass, which all helps for bigger yields, plus more feed value in the crop.

A dairy farm on the liming program got nearly all his hay rained on. Some of it was thought to be hardly worth feeding. He did give it to his cows, which, surprisingly, ate it well. He decided to go and buy some nice, green hay after all, as he thought the cows might do better.

He put some of this green hay in the feeder and those cows came a-running for it. They smelled it — it smelled "real good" — and took one bite and headed back for the rained-on hay.

The green hay had been fertilized heavily to make those big green leaves. It hadn't been limed so it wasn't sweet, but had a bitter taste, and those cows didn't like it. It must be that cows are smarter than we thought.

If we spread a lot of manure, we usually need calcium to help break down the acid from the manure. This will help make the nutrients in it more readily available.

Before we retired from farming, we had been on the Growers Mineral Solutions Program (G.M.S. is what we refer to in this article). I would recommend this program for all farmers. They say use high-calcium lime, if you can afford it, use Growers. They never say Growers first, and then lime last. The G.M.S. solutions are non-corrosive, non-toxic, very low in heavy metals, and have all food grade products. It is safe for livestock use instead of dry minerals. Most of the dry minerals (also the dry fertilizers) contain way too many heavy metals, especially cadmium, which is showing up in animal meats, and also in human tissue tests. This cadmium is very toxic, next in line after mercury. Most rock phosphate is very contaminated with cadmium. The more you put on, the more you tie up your soil, the more lime you will need.

The nice thing with the G.M.S. is you can plant around five acres with a horse planter with the liquid setup between fill ups "with a 2 row planter." This saves a lot of time over the dry stuff. There are cheaper liquid fertilizers out there but none are as pure as G.M.S. If you want to compare, ask if it can be fed to cattle. Most, if not all, of the rest would be quite toxic to cattle. If they are toxic to cattle, they must also be toxic to the soil.

Those who gain the most from calcium applications are the produce growers. It will put a lot of sugar into whatever you grow. What you should really have is a refractometer to measure the sugar content of whatever you grow. The sugar measurement reading is called the Brix reading, with the higher the number Brix reading, the higher the sugar content.

Plant some however you usually do, then plant some where you spread lime. Be sure to use some G.M.S. at transplant, and also foliar feed. Your customers will soon know the difference. You will too, if you run some tests.

There was a cantaloupe grower in the east that had pretty much sand for soil. He had an awfully hard time trying to grow good melons on this sand. Finally, he went on the liming program with G.M.S., and once he went on the program, everything changed.

In a period of fifteen years, he spread 100 tons per acre (which most soils would not benefit from), and it worked. He got tremendous yields with very high sugar-content melons.

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## Basics of Liming

Continued from page 2

His melons were going to a grocery chain at the time. The buyer called the grower, saying they needed melons, but the grower didn't think they were ready yet. The buyer insisted he send a semi-load, which he did. They tested these melons with a refractometer for the sugar content. A Brix reading of 6 was the minimum accepted.

The grower phoned the buyer, asking, did we make the grade? Oh, yes, said the buyer, your melons had a Brix reading of 18 — send us another load.

He picked them greener, and the load came in at a Brix reading of 12. The buyer wanted him to send another load. The grower told him they were still green, but the buyer said to pick them. The grower picked them greener than he had ever picked melons, and they came in with a Brix reading of 10. At the same time, conventional melons only had half of them coming in at a reading of 6, with the rest being rejected.

In the south, a watermelon grower was using 3500 pounds of dry fertilizer per acre, applied on each side of the row. By the first of June, these melons were rotting from the inside out because of the heat. He changed his program to eight tons of high-calcium lime per acre, ten gallons G.M.S. in the row, and weekly foliar feedings. His watermelons stayed good until the crop ended in the middle of July. He could sell good watermelons six weeks longer just by changing his fertilizer program.

Without adding calcium, these two growers wouldn't have succeeded just by changing fertilizers, as the calcium is still the main element for change. It is best if the lime can be spread in the fall or winter for the next year's crop, but anytime is better than not at all.

There was the Minnesota farmer who had an 80-acre rectangular field to which he applied three tons per acre on half of the field. A year later, something came up that he had to hire someone to chisel plow this field, as the farmer was not able to do it himself. He had the custom operator chisel these acres diagonally.

The man plowed awhile, then came up to where the farmer lived and asked him to go with him, saying that there was something very peculiar about the field that he needed to show him.

Since he was chisel plowing diagonally, about halfway through, he would have to shift down for the rest of the way, and then when he came back, he would have to shift up again. They operator said that it didn't make sense to him as it did that all the way through in a straight line up and down through the field.

The farmer told him that they had put three tons per acre of lime on the side of the field that chisel plows easier. That had been done a year earlier.

This was an unbiased comparison as the custom operator had no idea about what was going on.

I have a liming handbook and here is a list of advantages it gives about liming with calcitic lime, which is high-calcium ag-lime.

1. It requires less horsepower to pull your equipment.
2. It mellows your soil to a much greater depth.
3. It improves drainage.
4. It speeds up oxidation.
5. Soils dry much quicker in the spring.
6. It can reduce and eventually eliminate weed sprays.
7. Dry weather will not be such a problem. The excess water is stored deep in the subsoil provide moisture when needed.
8. It helps eliminate erosion by absorbing more water.
9. It improves the feed quality of plants by increasing protein and minerals, and decreasing nitrogen and potassium in the feeds.
10. It significantly helps to prevent winter kill in alfalfa.
11. It returns microorganisms and worms to the soil.
12. Crops mature earlier and dry down quicker.
13. Hay dries much faster.
14. It improves the palatability of the feed.
15. It dramatically improves the economics of farming.
16. It leaves our soils in a healthy condition for our children.
17. It allows a farmer to grow soybeans on a continuous basis because it provides available calcium year after year. Soybeans are proteinaceous crop and all these are calcium lovers.
18. It produces healthy plants that insects and pests will not eat.
19. Lime will increase germination by up to 30%.

The best way to know how much calcium your soil needs is by doing side by side comparisons. Put three tons per acre on one strip, leave a strip with no lime, another with six tons per acre (or however you want), and see for yourself. Nobody will benefit more from these test strips than the man doing the test. Experiment and you will be pleasantly surprised, unless you are one of those that doesn't want better crops, with more yield and more feed value.

If more information is needed, let me know. I'll either answer through the Plain Interests or directly. Please don't get the idea that we have all the answers, because we don't. The more we study soil biology, the more we'll know how little we really know. ■

*This article by Henry J. Kaufman of Clarissa, MN, appeared in the January 2009 issue of Plain Interests magazine.*

## On The Road Again

### WINTER 2010

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. 18-21	Delaware Ag. Week Harrington, DE
Jan. 19-20	Ohio Produce Growers Congress Sandusky, OH
Jan. 19-21	Virginia Farm Show Fishersville, VA
Jan. 26-27	Empire State Fruit & Vegetable Expo Syracuse, NY
Jan. 30	N. Michigan Small Farm Conf. Grayling, MI
Feb. 2-4	Mid Atlantic Fruit & Vegetable Hershey, PA
Feb. 3-5	Southern Farm Show Raleigh, NC
Feb. 5	Northern Indiana Grazing Conf. Shipshewana, IN
Feb. 9-10	Alexandria Area Farm Show Alexandria, MN
Feb. 10-13	National Farm Machinery Show Louisville, KY
Feb. 11	Southern Indiana Grazing Conf Odon, IN
Feb. 17-19	Canadian International Farm Equip Toronto, Ont., Canada
Feb. 18-19	Viticulture 2010 Rochester, NY
Feb. 23-25	Central Minnesota Farm Show St. Cloud, MN
Feb. 24-25	Ontario Fruit & Vegetable Conv. St. Catharines, Ont., Canada
Feb. 25-27	New York State Farm Show Syracuse, NY
Mar. 3-4	East Central Farm Show Lindsay, Ont., Canada
Mar. 10-12	Western Fair Farm Show London, Ont., Canada
Mar. 30-31 April 1	Wisconsin Public Service Farm Show Oshkosh, WI

*Hope To See You!*

## The 2009 Crop Season Is Far From Over

By Jim Halbeisen

The 2009 North American corn and soybean harvest progressed very slowly, and processors received finished crops with very poor quality traits — namely excessive moisture and very low test weights.

During the summer of 2009 many agricultural experts were openly discussing the possibility of crop problems resulting from North America's cool growing season temperatures. However, due to the crop season's extraordinary cloud cover, we at Growers Chemical Corporation have been much more concerned about the lack of sun energy reaching our crops. Experience has shown us crops will be lacking in energy value or will lack stored energy when grown during poor sunshine years.

Past research has shown plants grown in high calcium soil environments and receiving balanced loads of mineral elements (GMS) are better able to overcome low volume sun light situations. Vegetable operations combining the use of GMS and the Growers Program usually are able to maintain better quality and flavor produce than competitors focusing on the "Quantity-is-King" approach to fertilization. To actually demonstrate the advantages, Growers Chemical Corporation sales representatives use the refractometer, alcohol testing, oxygen bomb calorimeter and various other measurement tools. These tools can show customers crop quality traits, especially energy traits, can be

better maintained in low energy years following the Growers Program, instead of the high-fertilizer-input, especially the high nitrogen (N), approach.

Some farmers will contend since fertilizer rates were reduced for the 2009 crop year, quality issues should have been minimized. However, a close examination of the data shows nitrogen (N) rates were reduced the least amount and probably were actually increased in many cases to offset phosphorus (P) and potassium (K) reductions.

Livestock farmers who stayed with GMS and the Growers Program in 2009 will likely be feeding quality feed and will probably do just fine during the coming winter. But for the record, Growers Chemical Corporation wants to warn other livestock farmers of the quality trait problems in the North American 2009 corn and soybean crop, and, very likely, their forage crops as well which may show up in their livestock's health during the winter of 2009 and 2010. These quality problems may express themselves in different ways, such as various kinds of opportunistic disease syndromes. Next, the feed experts will be "Johnny on the Spot" to solve these afflictions with all types of usually expensive feed additives which will not be of much, if any, help. For their general lack of soil and plant science knowledge, these people will not be able to give any credible explanations for the troubles.



So, those livestock producers who, in their attempt to shave 2009 crop costs by using imbalanced mineral elements or not implementing or maintaining proper soil calcium (Ca) levels because it probably wouldn't result in larger crop volumes, could begin to suffer economic hardships in early 2010 following the feeding of poor quality 2009 crops and forages.

If unexplained livestock problems do develop, a call to the local Growers Mineral Solutions (GMS) sales representative could be very beneficial in getting (back) on the proper track. ■

### Green Revolution

*Continued from page 1*

and management practices. A common pattern emerged from most of these studies, revealing that soil nitrogen is depleted even with an ample input of synthetic nitrogen and the incorporation of crop residues. The problem is that ammoniacal fertilizers stimulate microbial carbon decomposition, resulting in the loss of crop residues and indigenous organic matter, the major reservoir of soil nitrogen.

Even with intensive fertilization, nonleguminous crops obtain the majority of their nitrogen from soil reserves, so any decrease in these reserves is inherently detrimental to productivity, although yields may for a time be sustained, or even increased, with improved varieties, higher fertilizer rates, etc. Eventually, however, soil degradation will become a cause of yield stagnation or decline, an emerging concern for intensive cereal production in Southeast Asia where population is growing rapidly and land areas are limited. A higher nitrogen rate will help for a time in maintaining productivity, but in the long run

this will only make matters worse as ongoing soil degradation further increases the need for synthetic nitrogen fertilization, intensifies food insecurity, and exacerbates environmental degradation.

If soil degradation is to be minimized, fertilizer efficiency must be increased so that unnecessary inputs can be reduced. This will call for a major change in fertilizer management, which for several decades has followed recommendations based on generic models of economic response, often involving major subsidy support as a substitute for economic viability. These "best management practices" are inherently flawed because they do not adequately account for soil nitrogen availability, nor do they emphasize the need to synchronize fertilizer form, placement, or timing with soil and crop nitrogen dynamics. The combined effect is bad news for producers: low efficiency for crop uptake of fertilizer nitrogen, typically 10-40% of the current year's nitrogen application.

Low uptake efficiency leads to serious economic and ecological trouble on a global scale. There is, of course, an economic loss

from the purchase of unutilized nitrogen, totaling roughly \$90 billion per year and impacting not only producers but also the taxpaying public that bears the cost of governmental input subsidies (currently \$15 billion per year for the U.S.). More difficult to quantify but no less real are the ecological costs that arise from decades of surface and groundwater pollution by nitrate, the growing occurrence of hypoxia in the world's coastal waters, and atmospheric enrichment by greenhouse gases generated from production and use of synthetic nitrogen fertilizers.

The world today faces a dilemma more critical than the current economic crisis, global warming, or terrorism. An expanding population bubble inflated by a half century of input-intensive agriculture demands an ongoing increase in grain production, while soil, air, and water resources have been degraded, and so has food and feed quality with adverse implications for human and animal health. This degradation will only intensify unless there is a return to diversified agriculture using legume rotations. In order for this to happen, the public and private sectors must be decoupled. ■

## Solution Found: (It Was There All The While)

By Jim Johns

The observations and warnings from Drs. Mulvaney, Khan, and Ellsworth concerning the excessive promotion and use of synthetic nitrogen fertilizers prevalent over the last half century certainly need to be heeded. Their work with the historic Morrow Plots has scientifically demonstrated excessive synthetic nitrogen applications actually reduce soil nitrogen, the plant's primary and most usable source. We at Growers Chemical Corporation totally agree with their assessment: too much synthetic nitrogen has been, and is being, recommended and used.

Not too long ago we aggressively pursued annual on-farm yield checking of various crops, especially corn. Yield checking corn crops was instituted over fifty years ago by Dr. Tiedjens as the best way to show and prove to customers Growers Mineral Solutions and the Growers Program would be profitable on their farms. Comparisons of GMS and all kinds of various other cropping methods were, and, are, encouraged. Wilbur Franklin continued the practice, as do J. P. Henry and Jim Halbeisen today.

Hand checked and over-the-scales yield results are published annually in our "Yield Results" book, and farmers raising at least 100 bu/ac of corn using only Growers Mineral Solutions, without any other commercial N.P.&K are given recognition. Arguably, these on-farm "results" mean more to the producers than those received from typical university experimental plots likely to have many unknown and dubious control histories.

Although our comparison plots and yields gained using GMS and following the Growers Program plots are not scientifically managed, the published results over the years are meaningful and important.

In our 1999 Yield Results book there were some 13 pages recording the yields of close to 100 farmer customers who "—used only Growers 10-20-10 on their corn in 1999. Other than manure in some cases, no other Nitrogen,

Phosphorus, or Potash was used. Those with yields over 100 bushels per acre become members of the 'Growers 100 Bushel Per Acre Corn Club.'" The 1999 first place winner from northwest Pennsylvania raised 241 bu/ac. The then all-time 1985 record of 276.6 bu/ac was from Central Pennsylvania. In 2008 the new all time record holder with 314 bu/ac was our preennial competitor from Northwestern Pennsylvania.

Dr. Mulvaney and his colleagues in The Browning of the Green Revolution call for improved fertilizer efficiency by way of timing and placement. We agree and offer the testimony of hundreds of farmer customers, recorded by way of our yearly Yield Results books, who have found most synthetic nitrogen inputs are not needed to economically realize above average corn yields.

When calcium needs of the soil are satisfied, in accordance with Dr. Tiedjen's Growers Program, the resulting enhanced soil microbial life will flourish and often supply adequate natural soil nitrification to much reduce, or

eliminate, the need for synthetic nitrogen additions.

Meanwhile, as long and consistently recommended, placing Growers Mineral Solutions directly on the seed at planting (or near the seed on hot thin Southern soils) and followed by one, or more, foliage sprays during the corn plant's growth stages, tends to address the issue of more efficient fertilizer timing and placement raised by Dr. Mulvaney and his colleagues. As the late Wilbur Franklin used to say, "The enemies of fertilization are time and distance." Which is true of any and all crops; produce, hay and pastures, row crops, etc.

While our published records do not approach the longevity and historical importance of the Morrow Plots, our Yield Results books do date back to the mid 1950's, near the beginnings of the Green Revolution — the inception of increased synthetic nitrogen recommendations and usage. Our Yield Results books provide an ongoing 50 year track record of a profitable and viable alternative to today's popular high synthetic fertilizer rate program. ■

## Award Winning Ohio Hay

By Staff

Alton Stephens of Elida, Ohio, won "Best of Show" at the 2009 Allen County Fair for his second cutting alfalfa. He has been using the Growers Program on his farm for 18 years.

Alton's wife, Carol says, "This was the first year for alfalfa in that particular field. Fifteen years ago we put on 15 to 20 ton of high calcium lime per acre on the field. For fertility, the guys foliar fed 2 gallons per acre of Growers Mineral Solutions (GMS) for the first cutting and 2 gallons per acre of GMS for the second cutting.

"Some of this hay was fed and some was sold. The calves and horses like it a lot, and they look very good. And anyone we sell it to always likes it and usually comes back for more.

"Alton says, 'This has been a very, very dry year for us, so there hasn't been that much hay around. At the time of the 4th cutting, we foliar fed and got 20 bales off of two acres (10 bales per acre). We didn't foliar feed the rest of this field and got only 50 bales off of the eight acres (6.25 bales per acre).'" ■



## Update on PotashCorp

By Staff

Looking into the thought processes of (our suppliers) the chemical manufacturers, in our Early Fall edition of *The Growers Solution* we quoted the CEO of Potash Corporation of Saskatchewan from the *Eastern Edition: Country Guide* of July 24, 2009. According to the October 26, 2009, *Eastern Edition: Country Guide*, apparently the thinking has not changed much since.

"PotashCorp has announced temporary layoffs starting in November and December for 800 workers at three of its Saskatchewan

potash mines, Saskatoon media report...

"This marks the third temporary layoff period this year for workers at PotashCorp's mines, as the company seeks to regulate supply in line with slipping demand..."

"Coming off a recent string of record-breaking quarterly profits, Saskatoon-based PotashCorp last Thursday reported net income of US\$248.8 million on US\$1.099 billion in sales for its third quarter ending Sept. 30, down almost 80 per cent from \$1.27 billion profit on \$3.06 billion in sales in the year-earlier period.

"The uncertainty among fertilizer buyers has

lasted far longer than we anticipated, but it cannot continue indefinitely,' CEO Bill Doyle said in the company's release Thursday.

"Writing in the *Globe and Mail* Thursday, financial analyst Fabrice Taylor said PotashCorp is now paying for its past record profits.

"PotashCorp,' he wrote, 'is the Saudi Arabia of the industry, the low-cost swing producer. Would it have better served its shareholders had it tempered prices by increasing production even if that meant earning less? It certainly had the capacity to do so.'" ■

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**Inside:**

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- The Browning of the Green Revolution
- Award Winning Hay
- Update on PotashCorp
- Drought Beans Saved

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## *Droughty Beans Saved*

By James Brushaber

**W**e have a small area which received very little rain this past summer. A little came in small streaks we could see out from the house, but this little area north of the house usually received only just drops — not what we needed.

On this droughty sand we foliar fed the beans several times at 1.5 qt GMS per ac. Some of the beans were already dead, but by feeding this small amount every week on what

was left we saved some for fall harvest. We thrashed part of them and were able to recover over \$200.00 per acre. Had we sat back and

drop in moisture on any crop, I would highly recommend he quickly puts the sprayer to work. Feed the leaves at the right time of day

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*We were amazed to see what was going into the bin from such small plants.*

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done nothing, that droughty spot would have been a total loss. So far we thrashed over \$600.00 and when completely done we should have a total of \$800.00 coming in from an area which could have been a total loss.

The bean plants were short, but held pod set and did not abort blossoms. We were amazed to see what was going into the bin from such small plants. We even found four-bean pods from this droughty area.

Whenever anyone experiences only a small

every week with a rate of at least 1.5 qt. up to 2.0 qt. GMS per acre until enough moisture is available to bring the crop back to normal. Spray at least twice every week, or even a little, closer after the rains come. Read the plants' needs each and every time before applying product. Some of what we thrashed had small sized beans, but some were normal in size, and although some had died, overall, we are 100% satisfied. ■

### **The Growers Solution**

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