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GROWERS MINERAL

1955

THE FARMERS SOLUTION



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The Growers Solution

LATE FALL 2025

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VOLUME 38 ISSUE 5

NORTH, WE GO...

by Chris Kohls, Growers Mineral Sales Manager

My summer travels this week take me north to visit our Growers Minerals nursery/tree aficionado, Markus Weber, and his wife Margit in Ruthven, Canada. Markus grew up on the family farm in Black Forest, Germany and enjoyed plants as a youth, especially edible plants because they feed people. Growing up on a farm, it became his life's passion. About 17 years ago, Markus moved to Canada to capitalize on his passion.

After a few years working in various farm operations, Markus established "Plantigro," an edible tree nursery. The last nine years, Markus has developed a fine business supplying local orchards, greenhouses, and some small farms and individuals with edible trees (apple, peach, cherry, plum, etc.) grown from cuttings (Photo 1). His process starts with making cuttings in the fall, overwinter in the cooler until March or April, then transferred to the greenhouse for a month or two (based on the weather). From there, the trees are planted in the field at 6' to 8' in a row and 5' row spacing (Photo 2), foliar spraying Growers Mineral Solutions and liquid calcium once or twice a week through the process. Markus also feeds Growers Mineral Solution through the drip to promote more microbes colonizing on the roots. This multiplies the efforts of the nutrient digesters turning soil and crop residue into plant available food which also makes a stronger root stock. After the first year of growing a strong rootstock, then, in year 2, when the actual bud or scion wood grows, he gives them even more Growers Mineral Solution and liquid calcium until they are ready to dig.

What makes Plantigro a special place is not only the process, but the live productive soil the trees thrive in. Focusing on the root and striving for big strong/hairy root systems, matching the root zone with the top zone of the soil, Markus has created a great soil environment, rich in nutrients and fertility, critical because they experience several environmental issues like windstorms, dry weather, mildew from damp conditions, high pest pressure, etc. A strong root anchor and a rich soil system help Markus prevent or avoid most of the issues, and weather the issues that are out of his control.

After the visit and tour of the Plantigro operation, we headed to the "Center for Horticultural Innovation" greenhouse to meet Matt Korpan, executive director of R&D operations. The center is part of a larger organization that not only does extensive research and trials, but has production greenhouses and also builds and designs greenhouses. Our visit to the research center was very interesting and truly amazing. The research being done on various plants, crops, trees, etc. with technology is comparable to the research being done within our medical



PHOTO 1



PHOTO 2

industry. The center does third party research along with several trials of various products and processes. It was a breath of fresh air to know there are organizations that are not influenced by the establishment. They operate on their own terms. They are in the business of providing answers and knowledge to benefit all, along with operating a profitable business enterprise.

As my day with Markus was coming to an end, we met Markus' wife, Margit, for lunch at the local diner. This is always one of my favorite times during my visits around the country (and Canada): Sitting down to share a meal with Growers folks and family. The talk usually isn't about farming, but family, and Markus has a great family! ■

ON THE ROAD AGAIN

Hope to see you soon!

This winter, Growers Mineral, Corp. is scheduled to set up and staff booths at the following upcoming farm shows. It's a great time to stop in and review your plant food and mineral supplement program, hear about new developments at Growers, or just chat with the folks who make it all happen—your friends and neighbors.

2025

Dec 9-11 Great Lakes Expo Fruit & Veg Show
Tues-Thurs Grand Rapids, MI

2026

Jan 6-8 Keystone Farm Show
Tues-Thurs York, PA

Jan 8-9 Mid-Ohio Growers
Thurs-Fri Millersburg, OH

Jan 8-10 Southeast Fruit & Veg Conf
Thurs-Sat Savannah, GA

Jan 12-15 Delaware AG Week
Mon-Thurs Harrington, DE

Jan 13-15 Fort Wayne Farm Show
Tues-Fri Fort Wayne, IN

Jan 14-15 Crop Growing Expo
Weds-Thurs Manheim, PA

Jan 15-17 Virginia Farm Show
Thurs-Sat Fishersville, VA

Jan 15 Peanut Farm Show & Conf
Thursday Tifton, GA

Jan 27-29 Mid-Atlantic Fruit & Veg Conf
Tues-Thurs Hershey, PA

Feb 4-6 Iowa Ag Expo & Power Show
Weds-Fri Des Moines, IA

Feb 4-6 Southern Farm Show
Weds-Fri Raleigh, NC

Feb 4-6 Alabama Fruit & Veg Growers
Weds-Fri Gulf Shores, AL

Feb 11-14 National Farm Machinery Show
Weds-Sat Louisville, KY

Feb 18-19 Ontario Fruit & Veg Convention
Weds-Thurs Niagara Falls, ON

Feb 19-20 Mid-Western Ontario Ag Expo
Thurs-Fri Clinton, ON

Feb 19-21 Western Farm Show
Thurs-Sat Kansas City, MO

Feb 24-25 Central Minnesota Farm Show
Tues-Weds St. Cloud, MN

Feb 26-28 New York Farm Show
Thurs-Sat Syracuse, NY

REMEMBER: MONTHLY CONFERENCE CALL

On the second Thursday of the month at 9:00 PM Eastern for the months of September through April, we hold a conference call usually featuring a picture from the Growers Calendar along with other important agricultural events. There is no participation charge for the call. For the call, dial 1-646-558-8656 (US) or 1-438-809-7799 (CAN). The Meeting ID is 359 647 7278.

MICROBIOLOGICAL RESEARCH OPENS A NEW DOOR IN UNDERSTANDING PLANT NUTRITION

SECOND OF A SERIES by Jim Halbeisen, Director of Research

In 2010, a research paper was published in *PLOS ONE* entitled "Turning the Table: Plants Consume Microbes as a Source of Nutrients." This research was conducted in Australia with the help of people from Switzerland and the United Kingdom. The stated objective of this research was to "explore the possibility that plants take up and digest microbes as a source of nutrients." The summary of their results "show that the uptake process involves modification of the walls of root cells which is followed by active incorporation and degradation of the incorporated microbes."

This team of researchers used some of the best scientific methods available, such as radioactive isotopes, gold labeling, and laser/electron microscopy to arrive at their recorded data. This data resulted in some very interesting stated conclusions: "High production crop systems carry a strong pollution footprint which contributes to greenhouse gas emissions and pollutes ground and surface waters (45), and new approaches to supply soil-derived nutrients efficiently to plants are being sought. Exploring the synergistic interactions between plants and microbes by harnessing soil microbes to supply crops with nutrients may be a further strategy."

This team of scientists is credited with terming this idea of plants eating microbes for minerals as rhizophagy. As this research received world wide recognition, Dr. James White from the Department of Plant Biology at Rutgers University took the lead in discussing rhizophagy research in the United States around 2018. Growers Mineral, Corp. was introduced to Dr. White's research during the beginning of COVID-19 in 2020 through the microBIOMETER company headed by Dr. Judith Fitzpatrick. Since that introduction, we have followed Dr. White's research to try and understand better the process termed rhizophagy. ■

FERTILIZER PRICES VS CORN PRICES ARE NOW SOME OF THE WORST IN HISTORY

by Jim Halbeisen, Director of Research

An article with the above title appeared on www.agweb.com on July 2, 2025. According to the article, a vice president of fertilizer at Stonex Financial, Inc. said the current fertilizer and corn price is at historic levels:

Urea: third worst in history
UAN: second worst in history
Phosphate: worst in history

After a lengthy discussion of the various geopolitical events, the author concluded that the fertilizer experts have advised farmers to "stay engaged, and when you see those pricing opportunities, jump on them, because they think the opportunities could be far and few between this year."

So, with this type of mentality in the agricultural establishment press, it was very interesting to see what the agricultural establishment suggested to deal with this problem

Ken Ferrie from *Farm Journal* gave several discussions on the topic of: "Can You Cut Fertilizer Expenses?"

1. In an early November article, Ferrie suggested pulling the anhydrous applicator deeper in the soil profile to expose the gas to a larger volume of soil and moisture. This would result in more N being trapped in the soil profile. However, Ferrie said the N retailers were cringing at that idea because Ferrie's field contacts said that farmers were using the anhydrous rigs more as subsoilers than toolbars for fertilizer applications.

2. When strip-tiling in the fall, if the soil is too dry a producer may want to apply N in the spring when it is close to the crop actually using the N. So, if the strip-till ground is dry and friable upon application, N loss could occur later after the application is complete.

3. In later articles, Ferrie became very emphatic about the use of lime in fertility programs. "Don't be too quick to pull lime out of the program. Adequate lime is important in making all your nutrients work at optimum levels. When margins get tight, lime is one of the first things farmers want to cut. In reality, it should be the last."

4. As it got closer to planting time, Ferrie started to focus on the element phosphorus (P). Ferrie states that the quicker plant roots meet up with P, the faster you see response. In-furrow applications trigger the quickest response to P. 2x2 application of P is slower to kick in than in-furrow application of P. Farmers are starting to use in-furrow and 2x2 application together with the in-furrow giving a quick response and the 2x2 application pushing corn to waist-high when soil P is released by the soil microbes. This approach is called the relay treatment.

5. Ferrie also suggests that trace elements, particularly zinc (Zn) help with the usage of P by the plant. He contends if the trace elements needed are too expensive, keep the traces and cut the starter rate down to your budget. At Growers Mineral, Corp., we tell producers when they cut the starter volume, make up the volume difference with high quality water.

In the early years of Growers Mineral, Corp., Dr. V.A. Tiedjens told farmers that they would never control the price of the product they produced. The only way to try and control ROI in farming was by controlling the cost of the inputs to grow that product. ■

PHOSPHORUS MANAGEMENT

by Jim Halbeisen, Director of Research

The article "Phosphorus Nutrient Availability and Uptake" was presented by www.farmprogress.com on March 1, 2023, discussing the need for the element phosphorus (P) in corn and soybean crops. This article stated that only 20% to 25% of soil applied P is available to the plant in the year that the fertilizer is applied because of chemical and biological parameters in the soil environment. Thus, it is very important to understand how to manage P availability for the crop from both applied P and P that is already in the crop's environment.

This article discusses how important P is for the plant early in the growing season. P is a key nutrient in root and shoot development, seedling vigor, energy, and reactions such as respiration and photosynthesis.

However, the article points out that the amount of P taken up by corn and soybeans reaches very high levels during seed set. **Figures 1 and 2** show the levels of uptake of P during the various growth stages for corn and soybeans.

These figures show that it is very important to have available P for the crop later in the growing season.

FIGURE 1. PHOSPHORUS UPTAKE CHART - CORN

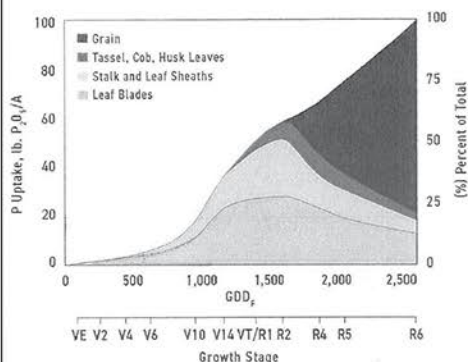
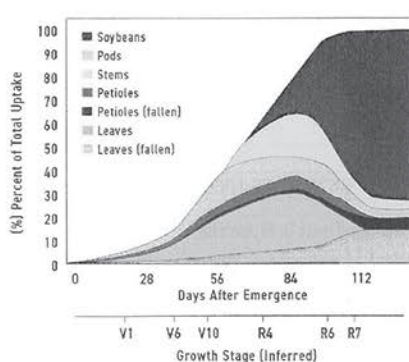


FIGURE 2. PHOSPHORUS UPTAKE CHART - SOYBEAN



The Growers Program helps with this by the use of in season foliar sprays and by helping the soil microbiological life release P from the soil environment during the entire growing season. The Growers Program method for making P available to the crop throughout the entire growing season utilizes the element P very efficiently which helps the farmer deal with possible future nutrient regulations.

The article closes by stating that best management practices need to be used with P fertilization to make sure nutrient management regulations are being followed by the farmer. Controlling the amount of used P is very important for environmental issues, climate change issues, and preservation of a key crop element that could be difficult to obtain in the future. ■

MAKE YOUR SOIL PAY YOU

by Jim Halbeisen, Director of Research

An article discussing the need for calcium (Ca) in soil appeared on www.ocj.com on October 3, 2024. This article from "Ohio's Country Journal and Ohio Ag Net Agronomy Notebook" stated several scientific principles which relate to soil nutrient utilization. The article title was "In Tough Times, Make Your Soil Pay You."

1. "Contrary to what may appear to be the case in agronomic textbooks, soil fertility is more complex than a mathematical equation. The state of soil nutrients, available vs. unavailable or "tied up" is continually evolving."

2. "One of the primary mechanisms for maximizing nutrient availability is maintaining soil test calcium (Ca) levels. Years ago, simply maintaining soil pH often meant Ca levels were sufficient. However, as the clean air act has reduced sulfur (S) deposition (less acid rain), soil pH is not declining as rapidly. In turn, the need to apply lime or Ca to maintain pH has also diminished. In the 1980s, our rainwater had a pH of 4.4-4.5, but it is much higher today.

"High calcium lime is an ideal source of Ca. However, as soils require less frequent lime applications to elevate pH, what are soil test Ca levels doing? We can no longer rely on maintaining soil pH to also provide sufficient Ca to maximize soil functionality. Think of it this way: the higher the base saturation cA level, the higher the soil oxygen (O) content."

3. "The bottom line is, as our weather has evolved, soil oxygen has inherently become the most yield-limiting element year in, year out. Maximizing soil functionality and reducing dependency on applied fertilizer primarily comes down to increasing soil oxygen."

This article included a flow chart credited to the University of Illinois from 2021.

↑ Ca = ↑ soil oxygen = ↑ soil Microbial activity → converting organic phosphorus (P) to plant available P

↑ Ca = ↑ soil microbial activity → Improved aggregate stability/soil structure → increased water infiltration

↑ water infiltration → reduced soil crusting

↑ water infiltration through the soil profile = ↓ seedling disease

↑ O = ↑ biological activity = nutrient release = ↓ dependency on applied nutrients"

This article is a very nice summary of what Growers Mineral, Corp. introduced in 1955. The terms 4R Nutrient Stewardship, 4Z, and ROI make the Growers Program approach even more important in today's agriculture. ■

LIFE IN THE SOIL

by Curtis Knepper

We would like to talk literally about the topsoil that brings our sustainability.

I find it very interesting that so many farm related folks like to talk about regenerative farming, life in the soil, and beneficial microbes. They spend a lot of money for all types of plants to cover their ground and then test the soil to see what the crop needs are and apply fully according to soil test recommendations. Many times, the recommendations include 200 pounds or more of nitrogen for corn, phosphorus fertilizers containing the heavy metal cadmium, and potash which contains 47% chloride. This test normally shows a soil pH of 5.5 to 6.5, and a calcium exchange level at 55 to 65%. When the soil test recommendations don't work, they try a bug in a jug product with no success. Also, they complain that their soil seems to be getting harder and more compacted. Sound familiar?

Now, if we are serious about promoting life in the soil, then our goal should be providing a habitat for this life. Let's forget what we were taught in the last 25 years, because now we need new thinking. Recently, research using a microorganism bio-meter has provided information as to what the habitat for beneficials should be. A soil pH of 6.8-8.0 and a calcium exchange of 80%! Remember, we are not pushing nutrients out of the exchange capacity or restricting the availability of nutrition by raising pH; we are creating a habitat for our beneficials. The beneficials then provide nutrition for the plants we're growing.

If you take a corn silage analysis, you will find that the percentage of nitrogen in the silage is approximately 1.3%, the phosphorus is .28%, the potash is 1%, and the rest of the familiar elements are just traces that create a total of about 4% of the total crop.

These facts should create a lot of questions:

1. Is corn silage really only 1.3% nitrogen?
2. Then where is the 200+ units we put on?
3. Then what is the other 96% of that silage if only 4% is minerals?

Answers:

1. Yes, the silage is only approximately 1.3% nitrogen x 6.8 which converts the nitrogen to protein.

2. Where is the 200+ units we put on? Nitrogen is very unstable by itself. You can find it in the wells, streams, creeks, and lakes.

3. The other 96% of the corn silage is made up of 3 elements: carbon, hydrogen, and oxygen (sunshine, water, and air).

The air we breathe is 78% nitrogen and 21% oxygen and is fully available to every crop, even in the desert, if there are no restrictions in the soil. You can put a bag over your head, and you might have 3 minutes to live. If you have a hard, tight, heavy clay, high mag soil, the beneficial life in your soil is limited by the lack of oxygen, and the free 78% nitrogen in the air is not usable to your crop.

The 200+ units of nitrogen on crops is the biggest soil mining operation in row crop farming because it not only burns out available calcium, but also burns out your carbon—which is the future humus for future crops in future years.

Calcium in the soil provides veins for 78%

"Life in the Soil," continued on page 4

New Beginnings

Honoring Our Roots—Building our Future

"Life in the Soil," continued from page 3

atmospheric nitrogen and 21% oxygen to travel to the crop roots and beneficial microbes. Hi-mag soils require much more fertilizer and more nitrogen because the roots struggle to branch out and magnesium has a bad habit of physically making the soil more dense. A density layer about 6-8 inches down will complicate matters even if the top soil is porous. Most farmers do not even want to deal with this, but it restricts yields big time. This happens especially in dry years.

So where do we start? Soil tests are really good to see what your pH is and where your calcium exchange falls in line, and how much Hi-Cal lime you may need. The soil test does not tell you if you have a density layer. The soil test, which is a chemical test, does not tell you the number of beneficials you have in your soil. The soil test won't tell you if your program is helping mellow up that hard, tight soil, and letting nature return to its desired path.

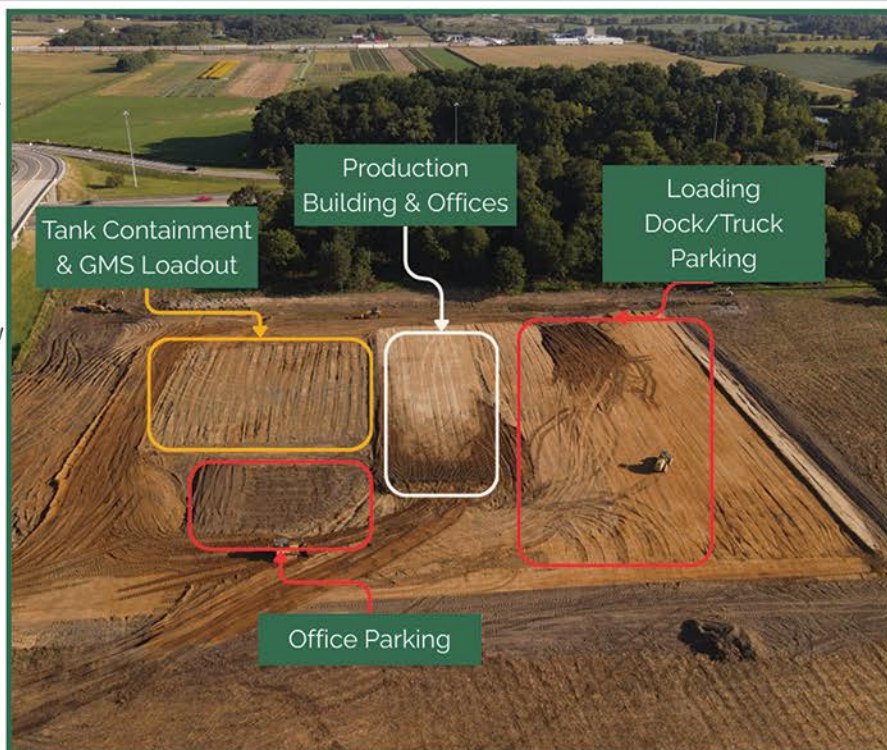
The soil test seems to pretend that its recommendations will provide 96% (carbon, hydrogen, and oxygen) of nutrients a plant needs for growth. In reality, the soil test only provides 4% of the elements needed for this season. We know this is true because, in a dry year like we had last year, they hydrogen and oxygen molecules (water) come up short, and the crops and yields suffered greatly.

We have to admit it. We have screwed up the system the Lord provided for us. For some, it's a long way back. The soil is very forgiving, but for some it will take drastic measures which no-till and cover crops may not fix.

Our goal should be providing a safe house for our beneficials to enhance the symbiotic relationship between our biology and our plants. The microbes' house should be just as safe as the house you live in.

There was a woman who worked as a medical scientist studying the human microbiome, and the treatment of immunotherapy for most of her career. She studied the different strains of biology and their potential to fight of invaders such as bacteria, viruses, and chronic disease. After retirement, she had an interest in researching the same protocol in different soil types around the world. This included the different species and their role in the rhizosphere. What she found was horror and terror to the atheist society, but provided comfort and hope to the believer. She found the biology in the soil and the biology in the human body are practically identical in every way. This reassures mankind that we were created from the dust of the earth.

Enough for now. Hope all readers have a profitable season. ■



DEAR VALUED CUSTOMER,

Our sales season is here! With raw material costs continuing to rise, we made every effort to get ahead by building inventory throughout last spring and summer. Our storage tanks are full, and we are ready to deliver. As you meet with your Sales Representative this fall, don't forget to take advantage of our discount periods. The 10% Cash in Advance discount is available through December 9.

On another note, progress on our new facility is moving right along! Over the past two months, our contractor has moved a lot of dirt, and we are beginning to see the new space take shape. Since this is our final *Solution* of 2025, we wish you all a wonderful fall season and hope you enjoy celebrating the holidays with your loved ones.

Asa Bobel *Russell Bobel*

Asa Bobel

Russell Bobel