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The Growers Solution

EARLY FALL 2007

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VOLUME 20 ISSUE 4

Soil Structure and Calcium

By Jim Halbeisen

Since the inception of Growers Chemical Corporation we have presented educational seminars for our customers and potential customers. Among other topics, we discuss the science of The Growers Soil Program. Relative to that, a customer sent us an article from the February 2007 *Western Farm Press* titled "Soil structure, crop quality tied to water quality." Its review now should be a timely reminder of soil calcium needs, because fall is the best time of the year to address calcium additions to soils.

The quotes following are from portions of the article.

"—, one of the most important current issues with growing crops in the West is the

issue of water quality and how it relates to soil structure, crop quality, and crop production.

"For irrigation water to be effective it needs to penetrate into the soil supplying enough water to sustain the crops until the next irrigation. Yet, most irrigation water used in California and the West is harmful to good soil structure, and eventually to plant growth and crop quality. Because infiltration problems develop slowly they are often overlooked. In many cases it takes just a few seasons for plants to begin to die or for the soils to become increasingly less productive."

"— The higher the sodium content and lower the total salt content of irrigation water, the more likely soil particles will become separated and disorganized. This is caused by a

chemical imbalance between calcium and sodium plus magnesium, both villains to good soil structure. Since both salinity and the amount of sodium and magnesium in irrigation water influences aggregate stability, all must be considered when determining the likelihood that water quality can reduce water infiltration."

It is important soils have good infiltration to hold rainfall in place. Any water movement on the soil surface causes erosion and areas or pockets of wetness and dryness. As is being pointed out in this article, Dr. Tiedjens had found calcium to be the key to soil aggregate stability and the most important element needed for good soil structure and improved soil infiltration and porosity. He also knew the

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Grass Based Farming Sells

By Jennie Henry

Ralph and Sheila Schlatter, near Paulding in northwest Ohio, have a grass based dairy. They also direct market broilers, beef, pork, lamb, eggs and turkeys from their on-farm store. Last year their direct marketing gross sales exceeded their milk check.

"Direct marketed grass based meat products is pretty much a niche market yet," Ralph said. "I feel we do need more small farmers getting into this type of farming. You might say I am enjoying not having much competition at this time! It's been a good move for us, and we feel blessed."

Ralph grew up on this farm, and remembers from twenty years ago when he was first introduced to the Growers philosophy, "It made sense to us. Maybe because we live in an area

that is, to me, difficult to farm. We have very heavy clay soils here, and they are wet. A lot of them are 70% clay content or higher, so we always struggled with row cropping.

"Over the years we have applied a fair

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New Product Name

We are in the process of changing the product name to Growers Mineral Solutions. Our original high quality product remains the same, but the new name more accurately describes what we are doing and what the product is meant to do, and that is, supply minerals to plants and animals. ■

Grass Based Farming

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amount of high calcium lime to our farm, with the home farm having had as much as 20 to 30 tons to the acre. We were putting a semi load per acre on with a manure spreader here while the rest of the farm only had 5 or 6 tons. For years, where we put on the heavier application, you could literally see the line where the clover and grass was taller and healthier looking. For three years now we haven't put any commercial fertilizer on over half the farm, and we are probably down to around 35-40 units of nitrogen on the rest.

"In 1992, when I was introduced to grass farming, I just went cold turkey and headed into it, because I thought this was the only choice we had if we wanted to stay in farming. So we started planting the farm to grass and clovers and haven't looked back. We have had a lot to learn and it's been an experience!, but it's been worth it. I enjoy what we are doing today.

"We recently built a 2,000 square foot store with a processing and demonstration kitchen. We have increased our freezer space, and we are increasing the products we offer for sale. We also are realizing that we have to offer more products year round. People don't come just in the fall, they come all of the time.

"Most of our customers come from at least an hour away, like the Toledo area and Lima. We're just amazed. It isn't unusual to get three or four new inquiries a week.

"People ask us all of the time if we are organic. We say, 'No, we are not certified. Our production is based on grass and pasture, and we feel this is a step beyond organic.'

"Its been said grass based finished products



Schlatters' lush volunteer clover for their grass fed chickens.

have a different nutritional profile than conventionally fed animals. I got a sample of raw milk from one of the big Dutch dairies in the county, and on the same day, I sent it and our own raw milk sample to the lab, labeled 1 and 2. The lab called me a few days later and said, 'You obviously have a grass based dairy and a conventional dairy here, don't you?' They told me which was which and that convinced me there is a difference in the milk's nutritional profile based on what the animal eats.

"We had an analysis done on our canned beef, and I compared it with the label on a very prominent canned beef from the grocery store.

Ours was significantly higher in protein, a little less in fat and higher in vitamin A and C and iron. To me, beef is not beef, milk is not milk, chicken is not chicken. It all depends on what the animal eats. There is a difference. This has me really excited about what we are doing."

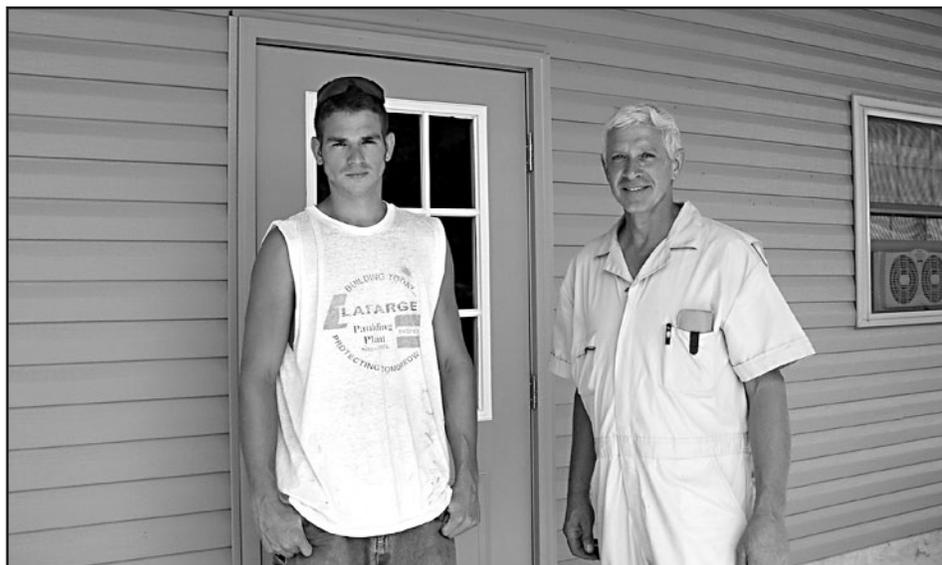
Ralph is pleased his children are interested in the direction the farm is heading. Twenty-four year old Kyle is involved with the farm. "Because he wants to be involved, that's one reason we are pushing so hard to keep all of these enterprises and the dairy going. But with dairy prices and expenses the way they are, the dairy doesn't make much.

"About a year ago Brian, another son, who is twenty-one now, spent a week in Indiana making raw milk cheeses while the owners were on vacation. We feel cheese could be one way to get out of the milk commodity market, so now, starting in September, we will be making and selling raw milk cheeses here on the farm."

"My wife Sheila is very involved with the farm, even while working off the farm two days a week. Our daughter Renae has graduated from high school, is working with the chickens and is very interested in the nutritional concept of what is happening here. Two older children have their own businesses.

"The broiler coops in the pasture are pulled forward everyday. They are staggered, so they cover all of the ground. The chicks come in the mail on Thursday when they are a day old. Eight weeks later on Thursday, we butcher. It just seems the last couple of years, since we have been using diatomaceous earth in the feed,

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Kyle and Ralph Schlatter in front of their new store that includes a demonstration and processing kitchen

Soil Structure

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villain of good soil structure to be magnesium, which is why Growers Chemical Corporation advocates high calcium liming sources rather than dolomitic limestone.

“Danyal Kasapligil, agronomist with Dellavalle Laboratory, Fresno says: ‘A lack of calcium in the majority of soils due to snow-melt irrigation water, or poor quality subsurface water, is leading to serious problems in California. What we are seeing in the field is,

not only are there more and more water penetration problems, but crop quality is also rapidly declining because of lack of calcium in our irrigation water.’”

Over the years Growers Chemical Corporation has consistently pointed out the need for calcium in the soil to promote good soil physical properties. However, especially in recent years, the lack of calcium in soils is having a significant impact on crop quality.

“— This water is too pure. It lacks calcium, essential for good soil structure; and any calcium existing in the soil profile leached below the root zone over time or used by the crops, and is typically not being replaced in required quantities.”

Although Growers Chemical Corporation has been criticized for recommending too much high calcium limestone, this quote emphasizes the need for certain quantities of calcium. We maintain the best way to determine those required quantities is by using the strip test. The strip test varies the rates of high calcium liming sources applied to ascertain which rate gives the best economic result.

“Also, for optimum soil structure there should be approximately 16 times more calcium than sodium, and eight times more calcium than magnesium in the soil.”

Mr. Kasapligil's summary reads as if it were taken from Growers Chemical Corporation's Sales Manual. Through the years we have suggested the percentage of calcium in the soil be eight times higher than the magnesium percentage.

“There are several ways to help improve water infiltration problems including:

— Physically breaking surface crusts and compacted soils with use of chisels, and rippers.

— Applying organic matter such as composts and manures to improve the stability of soil aggregates.

— Using wetting agents and related products to help with soil hydrophobicity.

“However, since the problem of water quality and penetration is for the most part one of chemistry and not physics or mechanics, a chemical solution to the problem using soil amendments containing calcium is usually required. With its addition, calcium's availability is increased in the soil while sodium and magnesium are decreased. The result is increased total salt concentration of the soil water and decreased exchangeable sodium concentration. Poor water penetration is directly caused by a chemical imbalance in the soil and irrigation water.

“Balancing both the soil and irrigation water using additional calcium can correct nearly all water penetration problems.

“Chemically, calcium counterbalances

sodium and/or magnesium, thus increasing both macro- and micro-pore formation in the soil. The result is a reduction in:

- Soil aggregate degradation.
- Surface crusting.
- Deflocculation or cementing problems.

“When calcium is applied to the soil and/or irrigation water, the detrimental sodium and magnesium are removed from the soil system. The chemical reaction and positive effect is immediate and dramatic, but not permanent. Therefore, a routine calcium application maintenance program is generally required.

“Water now penetrates deeper into the soil profile due to a more flocculated or organized soil condition.

— Less water is wasted due to runoff or “ponding” on the soil surface, thus reducing both wet and dry areas and erosion.

— Less irrigation water is required to achieve the same results.

— There is an improvement in water use efficiency. Twenty-five to 100 percent more water is available in calcium treated soils versus untreated soils.

— There is increased oxygenation in the root zone.

— Calcium is an essential plant nutrient, generally found in deficient quantities in most soils.

“Calcium is often required by crops in amounts comparable to nitrogen and potassium. Bitter pit in apples, blossom-end rot in tomatoes, peppers and watermelons; blackheart of celery, club-root in cole crops, are all calcium deficiency related. Calcium deficiency also reduces fruit quality and seed formation and quality in all crops.”

Thoughtful articles such as this help confirm the sound fundamental science and excellent basic research Dr. V. A. Tiedjens used in formulating the Growers Soil Program. Dr. Tiedjens, however, in commenting on this article might have suggested putting more emphasis on the high calcium liming products being applied to the soils rather than the water. He said irrigated soils tend to accumulate harmful alkaline salts (or high pH's) because there isn't enough rainfall or irrigation to flush them away. Calcium additions, especially calcium sulfate, gypsum, would reduce the sodium and magnesium salts and would improve soil structure, water holding, aeration, etc. ■

On The Road Again

EARLY FALL 2007

This fall Growers Mineral Solutions 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 programs, hear about new developments at Growers or just chat with the folks who make it all happen—your friends and neighbors.

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| Sept. 11- 13 | Canada's Outdoor Farm Show
Tues., Wed, Thurs.
Woodstock, Ontario |
| Sept. 13-14 | Central New York Farm
Progress Show
Thurs. - Fri.
Mohawk, NY |
| Sept. 18-20 | Ohio Farm Science Review
Tues., Wed, Thurs.
London, OH |
| Sept. 18-20 | Center for Small Farms
(at FSR)
Tues., Wed, Thurs.
London, OH |
| Sept. 18-20 | Wisconsin Farm
Technology Days
Tues., Wed, Thurs.
Albany, Green Cty, WI |
| Oct. 16-18 | Sunbelt Agricultural Expo
Tues., Wed, Thurs.
Moultrie, GA |
| Oct. 24-25 | Pennsylvania Grazing
Conference
Wed. - Thurs.
Washington, PA |
| Nov. 1-3 | Mid-Atlantic Farm Show
Thurs., Fri., Sat.
Concord, NC |

Hope To See You!

Growers MINERAL SOLUTIONS

EARLY FALL 2007

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EARLY FALL 2007

Purchase GMS Early For \$\$\$ Discount

FOR THE 2007-2008 SEASON, starting November 1, 2007, we will again be offering our seasonal Cash In Advance of Delivery (CIAD) discounts. The CIAD discounts for Growers Mineral Solutions (GMS) orders paid in November will be 10%, December 8%, January 6%, February 4% and March 2%. Orders paid in April through October will be at the list price.

The Growers CIAD discounts can pay three ways: 1. If the funds are available, it pays to buy early because the Growers CIAD discount is more than most banks' interest payments on savings; 2. If the funds are not available and borrowing is necessary, it pays to borrow and buy early because the Growers CIAD discount is more than the lending institution's interest cost; 3. Early orders help keep GMS prices

down because they allow deliveries to be scheduled more efficiently, and that requires less delivery equipment.

Call your Growers representative for an explanation of the early order discounts, quantity pricing, on farm storage tanks and delivery of Growers Mineral Solutions. ■

Grass Based Farming Sells

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they just get huge in eight weeks. We probably lose more to predators than we do from dying now.

"The chickens really prefer the clover. When we started, we planted orchard grass and annual and perennial rye. You can find a little around yet, but what really persists now is the

white clover and the bluegrass. I'm convinced that we get almost the same tonnage with them as we did with orchard grass. I like to see a good amount of clover in the field because it produces nitrogen. Applying nitrogen actually suppresses clover because it encourages the grass.

"We use Growers mainly in the dairy feed. Every year we think we are going to do some foliar feeding, but it seems like the summer just flies by when we are busy making hay and we don't get done what we want to do.

"Last fall late around the first of November, we actually did a little foliar feeding on some of the pasture, and my son commented, 'You notice that field where we put that Growers on late? The color is so much deeper green than the rest of the pasture.' It was amazing how they continued to eat on that. We thought there was 8 to 10 days of feed there, but the cows were there for over 2 weeks. So we definitely needed less hay that way. Kyle commented, 'Yes, we've got to do that again this fall.'

"We graze the cows after the chickens, because the cows concentrate more where the chickens have been. It kind of surprises me because that is raw manure going on the ground.

"The dairy gets about 5 pounds of purchased grain per head per day. We put it the bunk with the skid loader and then top dress it with Growers, and they eat it pretty well. Being grass based I recognize we don't get near the production we used to when we fed about 25 pounds of grain, but it's what the customers are wanting, and we are customer driven.

"Twenty years ago when we were still conventional farming, we took some Growers grown corn into the elevator, and the guy unloading said, 'We are taking samples to do analysis for protein and a few things.' A few days later he asked, 'What kind of corn was that? It was the highest protein corn we've had in here.' I think it was the Growers and the lime, the way it was raised. I feel Growers is the right way to go." ■

The Growers Solution

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