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The Growers Solution

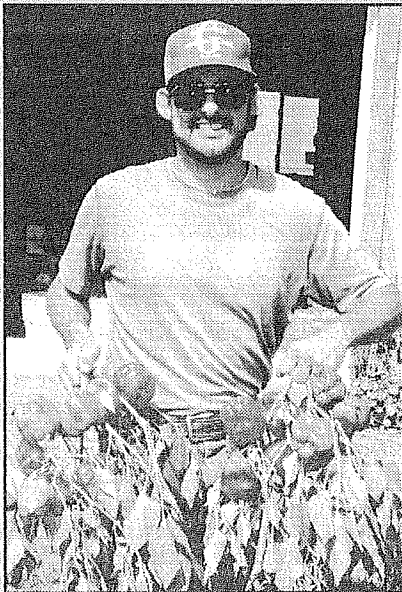
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FALL 2004

VOLUME 17 ISSUE 4

GNS Works Great on NY State Produce

By Jennie Henry



Ron Wagner, Rome, NY

Ron Wagner has 60 acres of produce and five greenhouses covering about 6000 square feet. He is at Rome, New York, which is an hour east of Syracuse. At his farm stand, and many local farmers' markets, he sells many varieties of vegetables, plants, garden supplies, and Growers Nutritional Solutions.

He explains, "We've sold just about a hundred small bottles of Growers this year. We believe in the product because we can see the difference, especially in the greenhouse, so we have really pushed it.

"Our biggest seller is patio tomatoes. We sell them, usually when the plant is about four feet tall, in three gallon containers with the tomato cage already on it. They ask, 'How did you get those tomatoes that big?' 'Right here is the bottle. This is exactly what we use.'

"Of course we use a lot larger quantity. We go through five gallons in just one day when we do the big greenhouse. We have an injection system and use Growers in the water. We are also foliar spraying with Growers. When we had our open house in May, both of these gentlemen attended,"

said Ron motioning to his Growers Sale Representative, Jim Marland, and Growers District Manager, John Sensenig. "They were both here and saw the difference in a couple of pepper plug trays we had around here. The trays were sitting under the overhead irrigation for the hanging baskets. When we fertilized the baskets, the excess water ran down into the center of these pepper trays, and there were mounds of peppers nine, ten inches tall."

John affirmed, "The peppers in the center were three times taller than the other peppers, all from the fertilizing water splashing down on them."

Ron laughed, "That's when we decided we could start using heavier doses with the Growers and do them closer together. By the time we were done, we were running a 1 to 100 ratio. We were running approximately five gallons of Growers when we were watering the big greenhouse which is about 2800 square feet with about 2000 square feet of bench. What you would use on about two and a half acres in the field, we were using in the greenhouse and you could really notice the difference!

"I started growing produce when I was in the
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Know Your Forages

By Jim Halbeisen

Recently I was with Joe Henry while he was giving some visiting Growers Nutritional Solution's (GNS) customers a tour of his Homestead Farms. During the tour Joe made a special point to note that implementing the Growers Program has resulted in an abundance of white clover in his grass pastures, and no white clover seed had ever been introduced. The white clover appeared strictly on its own. Joe is convinced this is a direct result of high calcium limestone applications and the foliar spraying of GNS. He also pointed out that never have herbicides or other fer-

tilizers been used on these pastures. The visiting gentlemen were told that the white clover is a very important addition to the pastures as it helps to improve the performance of the grazing animals.

Having walked these pastures before, the abundance of white clover has always been obvious to me; but I had not grasped its significance until Joe gave me an article from a sample issue of *The Stockman Grass Farmer*. The article, "Renovation - Plant Clovers in Grass Pastures" by Gary Butes, a forage specialist at the University of Tennessee, was very enlightening about the value of white clover in grass pastures.

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What Are Minerals And Are They Important?

By Jim Halbeisen

All forms of living animal and plant matter require chemical elements, such as oxygen (O), calcium (Ca), carbon (C) or phosphorus (P) for their normal life processes, but they contain these elements in widely varying amounts and proportions.

Some confusion arises when the terms "minerals" or "mineral nutrients" are used to describe individual chemical elements. The strict definition of a mineral is that it is a combination of chemical elements occurring in nature through natural processes. Minerals are the solid portions of the earth's crust. However, over the years the term "mineral" has come to be used to describe the chemical elements most important for sustaining and controlling animal and plant life. It is very difficult to define which chemical elements are actually minerals and which ones are not minerals. Some say the chemical elements left after burning animal or plant tissue are the mineral composition of that tissue. Yet in some cases, chemical elements that are always considered to be a mineral, such as sodium (Na), can be lost in some burning processes. Therefore, to make life simpler for us in agriculture, it is probably easier to use terms like "mineral", "mineral nutrient", and "chemical element" interchangeably, and to realize that these entities have specific functions in the scheme of life processes.

Also, as farmers, we need to realize that even though these entities, or minerals, are not used in large amounts, they still are very necessary for life functions to proceed properly. They allow healthy tissue progression and the existence of healthy animals and plants.

Because of the profits to be gained, agribusiness has placed too much emphasis on certain

minerals. This has resulted in mineral imbalances, unhealthy plant and animal tissues and, in turn, unhealthy plants and animals. These health problems are addressed by the pharmaceutical industry and have a positive affect on their profitability. Therefore, from this discussion it is easy to see why minerals have not received much attention in the press, especially the biased agricultural press.

To simplify our mineral discussions we are going to separate the animal and plant kingdoms.

I. ANIMAL:

Table 1 shows the chemical elements that compose an animal body. Most scientists would not consider the elements oxygen (O), carbon (C), or hydrogen (H), to be minerals. Rather, they would consider them to be the fabric of the animal tissue. The other elements occurring at lower concentrations in the animal's body would tend to be termed minerals and they perform specific functions within the animal's body. The broad functions of these minerals in animals are; Structural, Physiological, Catalytic, and Regulatory.

STRUCTURAL: Most of us realize that the animal's structural support comes from its bone mass, consisting mainly of calcium (Ca) and phosphorus (P), which is a large part of the animal's total composition

PHYSIOLOGICAL: The day to day operations of the animal body, such as breathing, growing, seeing, and walking, are the result of electrical impulses and muscle contractions that are stimulated by mineral concentrations.

TABLE 2

CONCENTRATIONS OF NUTRIENT ELEMENTS
IN PLANT MATERIAL AT LEVELS
CONSIDERED ADEQUATE¹

Element	Chemical Symbol	Atomic Weight	Concentration in Dry Matter
			ppm
Molybdenum	Mo	95.95	0.1
Copper	Cu	63.54	6
Zinc	Zn	65.38	20
Manganese	Mn	54.94	50
Iron	Fe	55.85	100
Boron	B	10.82	20
Chlorine	Cl	35.46	100
			%
Sulfur	S	32.07	0.1
Phosphorus	P	30.98	0.2
Magnesium	Mg	24.32	0.2
Calcium	Ca	40.08	0.5
Potassium	K	39.10	1.0
Nitrogen	N	14.01	1.5
Oxygen	O	16.00	45
Carbon	C	12.01	45
Hydrogen	H	1.01	6

¹ Mineral Nutrition of Plants: Principles and Perspectives
Epstein (1965)

TABLE 1

ELEMENTAL COMPOSITION
OF AN ANIMAL BODY¹

ELEMENT	PERCENT
Oxygen	65.00
Carbon	18.0
Hydrogen	10.0
Nitrogen	3.0
Calcium	1.5
Phosphorus	1.0
Potassium	0.35
Sulfur	0.25
Sodium	0.15
Chlorine	0.15
Magnesium	0.05
Iron	0.004
Zinc	0.003
Manganese	0.0003
Copper	0.0002
Iodine	0.00004

¹ Minerals in Animal and Human Nutrition.
McDowell (2003)

Although the amount of mineral needed to form these concentrations is small in volume, the results of these processes are extremely important.

CATALYTIC: The many individual cell functions that allow the animal body to perform physiological activities will not occur until proper sized components fit into the cell structures. These components, or catalysts, are the chemical elements, or minerals, listed in Table 1 below hydrogen (H). Catalysts are defined as substances that, when present in small amounts, cause chemical reactions to be accelerated or retarded while the substance itself is not permanently used up by the reaction. Again, the volume of needed mineral is small, but its effect can be very large.

REGULATORY: As with physiological and catalytic responses, certain minerals in small quantities regulate and prevent the animal's bodily functions from spinning out of control. They interact with the minerals that promote chemical reactions. Therefore, when an animal receives excesses of certain minerals, thereby reducing the absorbed amounts of necessary other minerals, certain body functions can run out of control causing too much growth in the tissues which in turn allow invasions of foreign entities; such as a fungus, bacteria, or virus.

On The Road Again Fall 2004

This fall Growers Nutritional 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.

September 14 - 16 Canada's Outdoor
Farm Show
Woodstock, Ontario

September 21 - 23 Wisconsin Farm
Technology Days
Chippewa Co., WI

September 21 - 23 Ohio Farm
Science Review
London, OH

Hope To See You!

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NY State Produce

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7th grade," he reminisced. "Back then I only had about a half acre of land I was farming. When I graduated in '97, I had an acre and a half of produce. It has grown each year until now we have about 60 acres." Ron started using Growers in 2001, and his greenhouse experience with Growers has helped him use the product more boldly in the field.

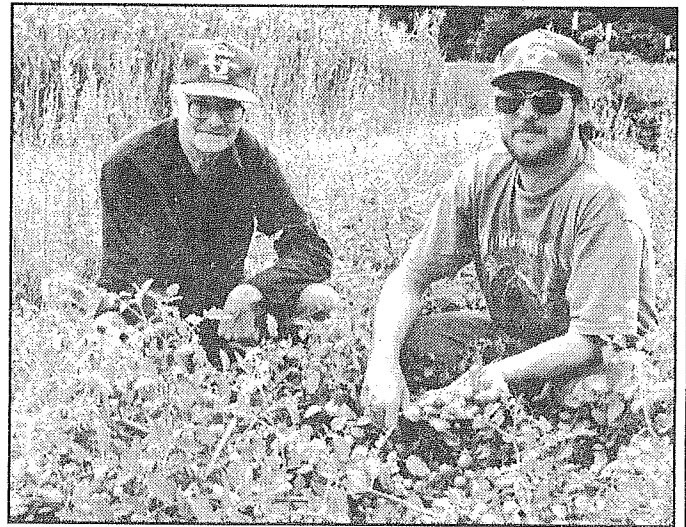
"When we transplant peppers in the field, we run 14 gallons of transplant solution to the acre. We were running a gallon and a half of GNS to 150 gallons of water, and they take right off! They haven't had any wilting when we put them in even though, for some reason, it is on the hottest day of June. Very rarely do we lose a transplant although we do run on plastic so there's more moisture. We also band 450 pounds of calcium, the really fine stuff, before we lay the mulch. With the combination of the Growers and the calcium, we notice a big difference.

Ron explained how he bands his fine, high calcium limestone, "Before we do the mulch, we disk the field, usually 3 or 4 times, about a month ahead of time. We really try to get the weeds worked up and keep the ground as loose as can be. We go by the center of the disks and use a coffee can per 15 to 20 foot at a time. Usually we put it on a foot and a half wide.

Then we lay the plastic, plant it and put on the Growers Solution. About a month later I hook up the irrigation system.

"I've got my cultivator set up with a one row sprayer on it. We're mixing about one gallon of Growers to 25 gallons of water, and it runs about 2 acres, which is about a half gallon per acre per cultivation. I could up it, but I'm getting decent results with that ratio. Tomatoes especially, we put those in the second week of June, and we're staking the first of July. They were already beyond the single string stakes, so we had to put two strings on them already. When I'm cultivating, I'm doing it in the hottest part of the day, no less. You can see the crystals on the plastic and on the plant, but we were having nice heavy dews at night, so the dew would just liquefy it and the plant would absorb it real fast.

"The quality of the tomatoes is just awesome! We've noticed very little blossom end rot and the growth really speaks for itself. The tomato plants are five feet tall staked.



Jim Marland and Ron Wagner, New York

"On the cherry tomatoes, we have eliminated 90% of the cracking we used to have. They also keep longer at the market. We can keep them in the pints up to five days without them rotting, dehydrating or splitting. I definitely feel it is partly because of the calcium and partly because of the Growers.

"Across the top," Ron concluded, "Growers is actually the cheaper way to go." ■

Know Your Forages

Continued from page 1

The author suggests that there are several advantages to having clovers in grass pastures. According to him, the nitrogen supplied to the grass from the clover, a legume, results in more total pasture production than using fertilizer nitrogen to push plant volume. His data showed dry matter yield increases of the white clover and grass mix pasture 6% to 30% higher as compared to grass only pastures receiving nitrogen fertilization. Also, he contends that the deeper rooted legumes help sustain pasture production during the dry summer months. Along with improved summer production also comes quality benefits from the legume's plant tissue.

To me, however, the most noteworthy part of the article centers on animal performance. The author states that clovers are important and are needed; for improved forage palatability, for calves to gain well, for cows to rebreed after calving, and for decreasing fescue toxicosis. Table 1 of his article shows that the addition of white clover to the grass pasture improves animal performance. This should be of great interest to cow-calf operators because the percentage of improvement is significant.

As Joe Henry has stressed for many years, the Growers Program is conducive to creating soil environments that allow superior balance of plant species which encourages health and longevity for consuming animals. But as agribusiness pushes the high production approach with high input levels, we will contin-

ue to see drops in feed quality. Following their lead, animals will have plenty of feed to consume, but the feed probably will not supply the needed nutrients.*

**Note: A recent article in Ag Professional, the official publication of the National Alliance of Independent Crop Consultants (NAICC) and the Certified Crop Adviser (CCA), discusses nutrient analyses of corn grain. Apparently the variability is so great several PhD's from the university system have warned, "Livestock producers should also consider the implications of nutrient variability of grain on*



Notice the white clover in the foreground.

ration balancing for the mineral nutrition of their animals". We plan to examine this research in detail in the Late Fall 2004 issue of The Growers Solution. ■

TABLE 1: EFFECT OF WHITE CLOVER ON ANIMAL PERFORMANCE

	Tall Fesque w/150# N	Tall Fesque & White Clover	Improvement
Cows in Study	38	38	
Cows Conceived During Study	27	35	30%
Calf Daily Gain	1.28#	1.82#	42%
Weaning Weight	351#	426#	21%
Pounds Weaned Per Cow Study	249#	391#	57%

Growers NUTRITIONAL SOLUTIONS

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Our Research is Your Profit

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What Are Minerals

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II. PLANT:

Table 2 is a reference first used in 1965; which is still used quite extensively in today's plant physiology literature. As with Table 1 for animals, all the chemical elements listed in Table 2 are considered minerals except for carbon (C), hydrogen (H), and oxygen (O). From soil experiments, early plant physiologists realized that neither just the presence nor the concentration of a chemical element, or mineral, in plant tissue is a criterion for being essential. The conclusion was that plants have a limited capability for the selective uptake of those chemical elements, minerals, essential for their growth. Realizing this, water and sand culture experiments were conducted to establish which minerals were important to plant growth.

Minerals for plant tissue can function; as a Constituent of an Organic Structure, as an Activation of Enzyme Reactions, or as a Charge Carrier and Osmoregulator.

CONSTITUENT OF AN ORGANIC STRUCTURE: For the plant cell tissue to have the strength to withstand its environment, in many instances, minerals must be present with complex organic molecules. As the ratios of minerals in plant tissues change, the quality of

the plant's structure can be changed in such a way that would allow infections or predators to weaken the plant. Also, if the plant is consumed for animal feed, the balance of minerals in the plant's organic structure will have a definite impact on the consuming animal's mineral needs. The total volume of a plant's mineral associated with its organic structure can be directly influenced by the soil and its mineral balances.

ACTIVATOR OF ENZYME REACTIONS: As with animal tissue, minerals are important in acting as catalysts for plant tissue. Many reactions can be accelerated or retarded by the presence of small amounts of substances which are not themselves permanently used up by the reaction. Such substances, called catalysts or enzymes, are divided into two general classes; Contact Catalysts and Catalysts Forming Intermediate Substances which in turn react and regenerate the catalyst. The many chemical reactions taking place in living organisms, called metabolic processes, are catalyzed by enzymes that require specific chemical elements or minerals.

CHARGE CARRIER AND OSMOREGULATOR: Osmosis, the movement of water between two solutions separated by a semi permeable membrane, is a very important process in living plant tissue. In a healthy environment osmosis occurs in specific mineral concentrations in the various cell organelles and allows cells to grow. Certain chemical elements, minerals, in specific concentrations, control nutrient flow, allow genetic transfer, and help in the capturing of sunlight energy. When plants are forced to absorb minerals, as a result of certain nutrient additions to the soil, these minerals can become toxic.

Chemical elements, or minerals, are very important for the growth of healthy animal and plant tissue. However, when the proper balance of minerals is upset, biological metabolic processes undergo interferences which may result in breakdowns causing diseases, infec-

tions, or illnesses, of the animal or plant system.

Growers Nutritional Solutions was conceived by Dr. V. A. Tiedjens, in part as a complete nutrient source for hydroponic operations. Today GNS provides mineral balance as a plant food in the row, at planting and later, as a foliage spray. Coupled with the Growers Program's use of high calcium lime, GNS can provide affordable balanced nutrition for the farm. GNS is also used as a balanced mineral supplement for animals. ■

Early Order Discount For 2005

We will again be offering our seasonal Cash In Advance of Delivery (CIAD) discounts at the start of our 2005 fiscal year, November 1, 2004. The CIAD discounts for Growers Nutritional Solutions for November will be 10%, December 8%, January 6%, February 4% and March 2%. 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 Growers CIAD discount is more than the institution's 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. The Growers CIAD discounts results in more orders being placed earlier. This allows deliveries to be more evenly spaced out, which requires less delivery equipment and helps keep GNS prices down.

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

The Growers Solution

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