

REGENERATING AGRICULTURE

A Keystone Bio-Ag Newsletter



Volume: 2 / Summer 2019

SEASONAL CALENDAR

JUNE

- ▶ June 12, KBA consultant with Alvin Peachey.
- ▶ June 19, KBA consultant with John Glick.
- ▶ June 26, KBA consultant with Dennis Keener.

JULY

- ▶ July 2, Keystone Bio-Ag Field Day (Fruit, Vegetables, and Hemp). More information on back cover.
- ▶ July 3, Keystone Bio-Ag Field Day (Dairy and Cash Crop). More information on back cover.
- ▶ July 10, KBA consultant with Alvin Peachey.
- ▶ July 17, KBA consultant with John Glick.
- ▶ July 24, KBA consultant with Dennis Keener.

AUGUST

- ▶ Aug. 14, KBA consultant with Alvin Peachey.
- ▶ Aug. 21, KBA consultant with John Glick.
- ▶ Aug. 28, KBA consultant with Dennis Keener.

Welcome! By now we are well into another brand new growing season. I was going to say that it's always good to start over again, but in reality if we start over, we are leaving everything behind that we gained or learned from last season. So I am going to think that we are still growing it as a continuation...

As of now, May 13th, we have 3 acres onions planted. They started off really well. We are planning on 6 acres processing Butternut Squash, and a half acre hemp yet. The fertilizer is spread and ground worked. We were ready to lay plastic then it got wet.

Produce field now was in corn last yr. we left the fodder out for carbon and potassium, then spread 6 ton per acre mushroom mulch for more carbon and nitrogen. Then to hold everything in place and keep it on the farm we spread Aeromaster Humus compost with LCP Blend and boron, then sprayed with Rejuvenate and 0P-8. Two tunnels Grape Tomatoes planted and growing. Other two tunnels are seeded with Recover-IT cover crop, has about 3 in. of growth.

The Tomatoes were planted no-till in what was seeded in Recover-IT last year, we have ground cover over everything with the drip underneath now. We spread Cycle and Vitality before covering.

Our first batch of small bales hay is in the barn with the fan running, our goal is to sell top quality organic horse hay; mold free guarantee; we'll see; if you want to try some, get your name in. Well, we have more to do, but so do you.

We are planning a field day the first week in July. Come around if you can. I hope to see you then. There are close to 100 new customers this spring. We welcome you aboard and hope you exceed your expectations.

Samuel L. Zook



GROWING CONSISTENTLY HEALTHY CROPS

Hi friends, and welcome once again. And for some of you, this is your first newsletter. Welcome aboard; it is truly an honor to help you solve your challenges and to help you produce healthy crops that are grown without chemicals.

So is it really possible for plants to become resistant to all diseases and insects? Yes, our observation has been that that can indeed be the case. It is not uncommon for the nutritional approach to outperform the chemical approach because we are not only trying to correct a symptom; we are solving the actual problem that is causing the symptom. Like using Sea Crop and Micro 5000 for fireblight control, for example; a sure fix, even though the conventional method really has no sure cure. Something else that is really standing out is drip applications of Rejuvenate, Spectrum, and OP-8 when crops are just a little sluggish. We have seen diseased leaves totally clear up and get dark green again. Amazing!!!

A question that I often get is, “what can I do for aphids, or cucumber beetles, or Japanese beetles, or diseases?” Or the latest question, “How can I produce high CBD hemp?” All of these questions fit well into the discussion for this article.

While plants can be resistant to all diseases and insects, they don't become resistant

to all of them at once. Instead, the plants become resistant to different groups of diseases and insects as plant health increases, which is something that is quite well explained on the “Plant Health Pyramid” chart that was developed by John Kempf.

At level one, plants achieve complete photosynthesis. Plants begin producing higher levels of sugars, often as much as 3-4 times higher, as well as actually metabolizing (making use of) those sugars. Plants become resistant to all the soil borne fungal pathogens such as verticillium, fusarium, rhizoctonia, and pythium, as well as phytophthora. To achieve this level of plant health, plants need to have adequate levels of these five minerals: nitrogen, magnesium, iron, manganese, and phosphorus, in addition to having enough water and carbon dioxide as discussed in the spring newsletter. Plants also need sunlight but when you address these five “photosynthesis” minerals, the plants reaction to sunlight changes dramatically, allowing plants to fully use the sunlight that they are getting. Phosphorus is actually one of the things that we have had a challenge with organically for many years but thankfully that has changed with OP-8. Some of the sap analysis coming back showing high in phosphorus without adding any through drip or foliar. This is

not always the case however, but we do see a good response when we start adding phosphorus, which is different from the past.

At level two, plants achieve complete protein synthesis. This is when all the nitrate, ammonium, urea, and amino acids are rapidly converted into complete proteins (total nitrogen). Plants become resistant to all the larval and sucking insects that depend on nitrate and ammonium as a food source, such as tomato horn worms, cabbage loopers, corn borers, corn ear worms, aphids, leafhoppers, whiteflies, and thrips. To achieve this level of plant health, plants need to have adequate levels of magnesium, sulfur, molybdenum, and boron.

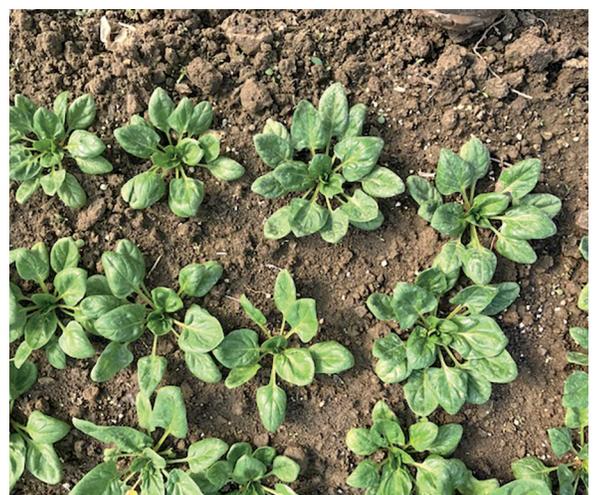
At level three, plants develop a surplus of energy which is stored as plant fats and oils. The plant can tap into these reserves when it encounters stress. In this level, plants become resistant to all the airborne fungal pathogens, such as downy mildew, powdery mildew, late blight, fire blight, rust, bacterial spot, and bacterial speck. To achieve this level of health, plants require a very aggressive plant microbiome in the soil rhizosphere (The rhizosphere is the area in the soil directly surrounding the roots) and they need to be picking up all their nutrition in the form of microbial metabolites; they can't be absorbing nitrate from the soil. A microbial metabolite is a combination of the various minerals in the soil which have already been digested by bacteria and combined into one compound, which is easier than absorbing individual nutrient ions from the soil.

NEW PRODUCT RELEASE!

Product 10 is a new, very powerful microbial inoculant that is producing very nice crop responses. Will possibly replace Spectrum and OP-8. Call for recommendations.



Spinach treated with Product 10.



Spinach on control section (no Product 10 applied)

Both treated and untreated spinach was put in a bag and stored in Refrigerator. After 5 days, we pulled the spinach out of the refrigerator to check on it. The treated spinach still looked nice and fresh, while the untreated spinach was all shriveled up and unfit to eat. The difference was amazing.

At level four, plants begin producing elevated levels of PSM's (CBD from hemp is a PSM). PSM's in plain English are called essential oils. These elevated levels of PSM's lead to resistance of almost ALL insects, such as Japanese beetles, corn root worm beetles, squash bugs, Colorado potato beetles, cucumber beetles, and stink bugs, as well as to root rot nematodes and viruses because the plants are producing immune compounds. To achieve this level of plant health, plants require the correct microbes in the soil rhizosphere to trigger the SAR and ISR pathways.

Level two, three, and four are all dependent on level one working properly; you can't just step in and start at level two and expect it to work without addressing level one properly. The same is true for CBD production, which is at level 4 of the plant health pyramid; level one, two, and three need to be working properly in order to produce a lot of CBD. You will be able to produce some without achieving this level of plant health, but level 4 is where they begin producing "elevated" levels of CBD.

So back to the original question, "What can I do for aphids, or cucumber beetles, or Japanese beetles, or diseases? While Photo Mag and Sea Shield can work sometimes, the best and most consistent method for getting rid of these insects is to sap test the plants to see what they need, then start with addressing all the photosynthesis minerals (level one) which are low, which might include iron, manganese, and phosphorus, for example. Once you have addressed those minerals, you are ready for addressing level two, which is converting nitrates into complete proteins; something that Photo Mag is so good at doing. But it won't work without addressing level one first because proteins are basically "sugar + nitrogen"; plants need to be making a lot of sugars so that they can form proteins.

Sap analysis is a powerful product validation tool and should be used if you are serious about growing healthy crops that are resistant to diseases and insects. Otherwise, how are you going to know which of these nutrients that the plant really needs, and if you have properly addressed the minerals for level one?

Testing, not guessing, along with good management, is the key to consistently growing healthy crops. Sap test your plants to see exactly what they need, test your foliar spray for EC, test your soil for minerals and carbon to nitrogen ratio, and test your water for hardness. Testing your water is a very important factor because hard water can reduce fertilizer effectiveness by as much as 70% as discussed in a previous newsletter.

This is something that has stood out to me a lot this spring; the farms that are using hard water (higher than 5 grains of hardness per gallon) are not to be as productive as the ones that either have good water or are using the Aquamomics Water system.

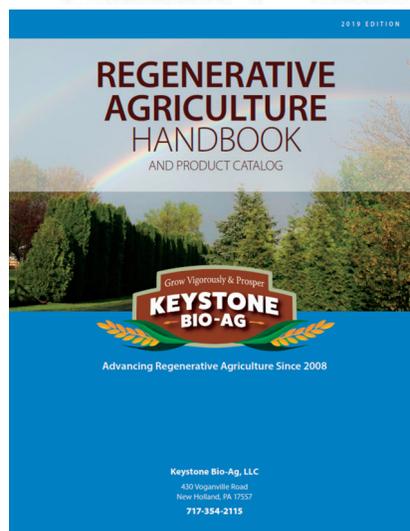
We are no longer accepting sap tests at LFFC since local farmers can send them with Rural Delivery Service (717- 802-2276), or 9-5 delivery (717-629-2117). All sap tests except Hemp need to be here by Thursday Noon! Hemp sap tests need to be here by Tuesday Noon! If you want to take sap tests, you need to call about 10 days before to order your kits and instructions.

PLEASE call your local consultant with your questions. I do appreciate everyone that has joined us, but I am getting swamped with phone calls, so make my job easier and call your consultant. If it is something that they can't answer right away, they can get back to you. We are actually looking for a new consultant as well, so if you have interest in a job like this, please let us know.

And yes, after a winter (and part of spring) working on the Regenerative Agriculture Handbook, it is finally in print and more than 14% of the copies are already sold! Thanks for your patience and support for this project. And if you want to buy a copy, send \$25.00 (add \$7.00 if shipping is needed) to your consultant and he will get you one.

One thing that I have heard a number of times this spring is that the amino acids aren't mixing properly. Try putting water into a bucket, adding some liquid fertilizer, then using a drill with a mixing blade and stirring the water while slowing shaking the amino acids into the bucket. It should mix well and not foam as much if done correctly. We have a \$10 bucket screen which sits on top of a 5 gallon bucket, making it easier to screen the nitrogen or other fertilizer before spraying.

Melvin F. Fisher



GROWING TIPS



ROW CROPS

Root worms become active around June 10. Consider sap tests. Monitor and be prepared with foliar spray of 1 qt. each of Rebound Iron, Rebound Manganese, Photo Mag, and 2 qt. Sea Shield with 20 gallons of good water per acre. Add nitrogen if needed.



DAIRY

Watch for leaf hoppers on alfalfa. Foliar spray 1 qt. each of Rebound Iron, Rebound Manganese, Photo Mag, and 2 qt. Sea Shield with 20 gallons of good water per acre.



PRODUCE

Don't guess - measure! Use sap tests; much more accurate than tissue tests. Sap tests, when used correctly, can catch a potential nutrient deficiency before it manifests itself as an insect or disease problem.



ORCHARD

Now is the time to fix bi-annual bearing. Use sap tests to determine why trees don't have enough energy to fill both this year's fruit and initiate next year's buds. Fireblight? Use 6 qt. Sea Crop and 2 oz. Micro 5000 per acre.



GREENHOUSE

Use shade cloth on greenhouse. Hot temperatures (80°?) can shut down photosynthesis and can switch the plant to photorespiration; a process that prevents calcium, boron, and manganese from moving to upper leaves. Use frequent watering.



GARDENERS

Add nitrogen if you need more push. Most gardens are overloaded with shaving manure / woodchips, which are high in carbon and tend to tie-up nitrogen.

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Summer Field Day Notice

We will be hosting our annual field days on July 2- 3, 2019. We will be discussing the crops in the forenoon and having a seminar in the afternoon. Bring your questions - take home an answer. Mark your calendars. This is your only notice!

The Fruit, Vegetable, and Hemp field day will be held July 2, at Keystone Bio-Ag, 430 Voganville Rd. New Holland Pa 17557 from 9:00 to 3:00. Lunch will be served.

The Dairy and Cash Crop field day will be held July 3, at Sam King, 113 N. Harvest Rd., Bird-in-Hand, PA 17505 from 9:30 to 2:30. Lunch will be served.



430 Voganville Road
New Holland, PA 17557
717-354-2115

Please contact us if you no longer wish to receive our quarterly newsletter.

- DEALER LIST -

Alvin Peachey | 717-935-2413
9-12 a.m. Monday, Wednesday, and Friday or by chance.

Counties of service: Franklin, Huntingdon, Juniata, Mifflin, Perry

John Glick, Willow Bank Seeds | 814-933-9720
7-9 a.m.

Counties of service: Clinton, Centre

Dennis Keener | 570-412-2195
Cell Phone

Counties of service: Columbia, Lycoming, Montour, Northumberland, Union

Dan Stoltzfoos | 717-661-7343

Counties of service: Lebanon County and northern Chester County, plus dairy consulting throughout Lancaster County

PRODUCTS

WHOLESALE & RETAIL

SERVICES & DEVELOPMENT

RESEARCH & EDUCATION

always produce great tasting food and feed with high nutritional value. Our guaranteed process enables farmers to reduce or eliminate harmful chemical applications.

We stand by our belief in sharing knowledge, inspiration, and active research through our *Regenerative Agriculture Handbook*, educational meetings, and quarterly newsletters, as well as through our personal on-farm or phone consultations. Our ultimate goal is to help you grow vigorously and prosper.

In everything we do, we believe in thinking differently from the mainstream agriculture. We believe in working with nature rather than against it. Our approach is that diseases and insects are not the problem; they are only the symptoms of nutritional imbalances, which means that we need to find and resolve the reason why plants do not have a functional immune system.

Keystone Bio-Ag has developed a nutritional management program with which it is now possible to produce plants that are resistant to diseases and insects. This model, when implemented properly, will

