



formulating assist

Posted by [Michael Phillips](#)

[Forum List](#) [Message List](#) [New Topic](#)

[Michael Phillips](#)

[formulating assist](#)

June 27, 2021 11:46PM

Moderator

Registered: 11 years ago

Posts: 621

Working to develop "bionutrient ferments" that can be made on the farm is a blast as I discover the right order of chemistries and how far I can push concentrations for each targeted nutrient. The clincher, of course, will be confirmation that these biologically-induced formulations have reaching power with respect to [plant sap analysis](#). Few in the network have engaged in these types of discussions – beyond pondering the calcium challenge – but I'm hoping some of you citizen scientists out there might be willing to help me with tangential insights.

The organism side of this is fairly worked out, thanks in part to some in-depth chats with Steve Becker at [Tainio Biologicals](#). This part matters as it's the microbes that ready the nutritional oomph in a reduced form.

Holding what are typically thought of as soil amendments in solution varies by nutrient. Magnesium sulfate and manganese sulfate are especially amenable. Iron sulfate simply requires a pre-application shake in the jug. Coral powder definitely settles so this oceanic take on calcium carbonate calls for a full bucket stir before pouring a chosen rate into the spray tank. I have yet to work with a boron source so thoughts there would have value. Ditto for phosphorus. A potassium boost lies waiting in everyone's vinegar barrel as already evidenced in plant sap results.

Assorted organic acids work on each respective nutrient to keep things bioavailable by means of chelation. Amino acids result from an activated biology. Gluconic acid the same, given the skillsets of a particular bacteria on the team. Purchased versions of citric acid, humic acid, and fulvic acid can be added as timing (order of chemistries) suggests. One reference I've found points to citric acid in helping make Zn and Ca more available in leaves, whereas in the fruit, the concentrations of Mn, Mg, and P increases as a result. It's this sort of information that provides pertinent clues for homegrown discovery. (And leads to some eruption excitement in one known instance!)

I'm curious about the thickness of nutrient formulations made by Agri-Dynamics, AEA, and others. Not that this is necessary on the home front, as no product needs to be shipped (liquid formulations essentially double in price as a result) and we can simply use a higher rate when required. Yet the viscosity factor does seem to be the driver of keeping these formulations well-mixed. One friend suggested using corn starch. I have tried arrowroot flour in one of the calcium batches and it did seem to help in this regard temporarily. I'm suspecting osmosis may play a role in the commercial formulations? Or the structured water route by means of substantial stirring in a vortex? Any and all speculation is welcome.

All of the juicy details regarding this will be shared in a next book. Understanding "nutrient pulsing" goes hand in hand with proper application of bionutrient ferments and/or commercial formulations. To be honest, I'm surprised other fruit growers have not yet chimed in on the value (or not) of [plant sap analysis](#) in the big picture of holistic orcharding. And so I try again to engage a few of you, perhaps, maybe...

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

Edited 2 time(s). Last edit at 07/12/2021 02:44PM by Michael Phillips.

[Reply](#) [Quote](#)

[Michael Phillips](#)

[Re: formulating assist](#)

January 01, 2022 06:02PM

Moderator

Registered: 11 years ago

Posts: 621

Let's kick off the new year with some genuine orchard talk—admittedly with myself talking to myself—but hey you never know who might now be ready to join in. What I wrote last summer still stands with regards to mineralization discoveries. There's complexity here which is precisely why insights from other fruit growers will be helpful. Advancing our mutual learning curve is how we all become better at working with our trees to grow healthy fruit for our families and communities... but y'all know that!

The big takeaway from plant sap results in 2021 is that homegrown formulations proved as effective as commercial formulations in almost

all instances. Trace mineral tonics (like Agri-Dynamics' Mikronite or AEA's MicroPak) are the ones I'm admittedly not going to tackle at this point. Comparing nutrient spray applications made to Sweet Sixteen trees in one block to slightly different applications made to Bonkers trees in another block involves budgeting compromise but leaves plenty of room for useful subjective analysis. Crop quality was a personal best here in Lost Nation this past season. Yet the real driver behind this research project into optimal tree nutrition is next year's buds. Whether we think of this as increasing return bloom or balancing crop load or simply upping off-year production by a noticeable percentage. Those of you using nutrient formulations have experiences worth sharing.

Increasing photosynthesis efficiency is where it's at as we head into 2022!

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

[Reply](#) [Quote](#)

[James Smith](#)

[Re: formulating assist](#)

January 01, 2022 06:48PM

Registered: 2 years ago

Posts: 57

I'm listening, so you aren't just talking to yourself. However, I'm too much of a noob to offer any insights to the subject. About the only thing I can say is that I went to Tainio Biologicals website and saw they are located in Spokane, WA, which is not far from the Okanogan Valley. I'm sorry, it's not much, but it is all I have. For now, all I can do is absorb what you experienced orchardists have to offer, practice it, and perhaps someday have something to offer as even a blind squirrel occasionally finds a nut.

Washington Okanogan Valley

Zone 6b

[Reply](#) [Quote](#)

[Mike Biltonen](#)

[Re: formulating assist](#)

January 02, 2022 04:59PM

Registered: 11 years ago

Posts: 298

To all the noobs and blind squirrels: Even if you don't have answers, bring questions. Please consider this: this is all new to us - though new at certain levels. If we had it all figured out already, then the forum would be irrelevant. We're all noobs to a certain degree, we're all learning, we're all benefiting from each person's individual and collective experiences.

Bring it on!

[Mike Biltonen, Know Your Roots](#)

Zone 5b in New York

[Reply](#) [Quote](#)

[James Smith](#)

[Re: formulating assist](#)

January 02, 2022 05:33PM

Registered: 2 years ago

Posts: 57

It may very well indeed be the nut this blind squirrel finds will come in the form of a question, Mike. But for now, I'm Googling 'plant sap analysis', Agri-Dynamics, and Tainio Biologicals to get an idea of what is being discussed. Perhaps at some time I'll ask a dumb question that will cause you scholarly types to pause and look at the subject from another direction and inspire thoughts you might have not otherwise. In the meantime, I'll relish in the delight I got you to comment, because comments are the life of the forum. Not only does it assure dear Michael he is not just talking to himself, but those who check the portal and see new comments will check more often and perhaps comment more. An apple a day may keep the doctor away, but a comment a day will bring more participation. 😊

Washington Okanogan Valley

Zone 6b

[Reply](#) [Quote](#)

[Mike Biltonen](#)

[Re: formulating assist](#)

January 02, 2022 05:44PM

Registered: 11 years ago

Posts: 298

A few thoughts right out of the gate:

- which sap testing company do you use?
- are their reference levels verified through research and for the specific crop tested? Do you trust the results?
- when you speak of timing, does this mean different application times or different timings when added to the overall mix?
- what type of mixing device do you? You mention structured water and vortex mixing, are you using a flow form or vortex brewer or a true structured water system during mixing?
- viscosity would seem to have an effect depending on whether you want a nutrient suspension or an actual solution. So when you say well-mixed are you speaking of a suspension or solution?
- Osmosis would imply a concentration (not necessarily viscosity) driven process, unless I misunderstand your statement.

I ask these questions because this thread is pertinent to thinking I have been doing the past few years. I have used Crop Health Services for testing, but the results have always been slow in coming and there is never any supporting data for the levels they claim to be optimum etc. Not that they are wrong, but inquiring minds like to know. The other issue I have with sap (or any mineral) testing is it is still reductionist and avoids some of the more 'energetic' needs of the system - which to me about acknowledging the interactions and interrelationships of the nutrient cosmos (if you will). This also includes the soil biology, which as we've already acknowledged is the lynch pin in the system. Much of this gets into work that Steve Diver and other have done over the years - and also includes the principles of biodynamic farming.

The use of the biodynamic preparations in conjunction with mineral and biological fertility amendments helps to begin to address some of these energetic issues.

The mixing is a critical thing that not enough is talked about. It may belong in a different thread. From the very basic hand-mixing to create a vortex, to simple flow forms, to highly complex flow forms, to mixing devices (e.g., Vortex Brewer), to true structured water devices, we introduce the energetic aspects of what's missing when we just mix something and put in a tank of water (not saying that you do). But we do not talk enough about the practices and tasks that surround the application of fertility and their energetic potential and how that relates to the whole system. Maybe I'll start a thread on mixing in another category (what do you suggest?). Or is there already one?

Anyway, to your baseline question - I have and do use basic mineral testing as well as sap testing. It can be expensive and I question the results and recommendations. But the information is so much more expansive and timely (it hits at the proper crop development stages if done right), I just need to take it into another realm and think of everything energetically - not just "how much of X do I add to get Y?".

Lots of meandering thoughts to kick off the new year. Cheers!

[Mike Biltonen, Know Your Roots](#)

Zone 5b in New York

[Reply](#) [Quote](#)

[Michael Phillips](#)

[Re: formulating assist](#)

January 03, 2022 05:59PM

Moderator

Registered: 11 years ago

Posts: 621

The core premise behind comparing homegrown "bionutrient ferments" and commercial nutrient products ties to obtaining somewhat equivalent results on [plant sap analysis](#). Headway made last season confirmed I'm on track with using specific biology to quasi-ferment mineral soil amendments into reduced form. That last bit is pivotal with elements like manganese and iron as what's received from soil sources is more often than not in oxidized form. Another way of thinking about all this is in terms of bioavailability. Plants work best with reduced chemistries to make enzymes that further boost photosynthesis.

This thread is essentially about the practicalities of making effective homegrown products. Many of these minerals readily go into *solution* whereas calcium carbonate definitely is a short term *suspension*. And yet companies like AEA and Agri-Dynamics have somehow figured this out, as their respective calcium formulations (HoloCal and CalSentials) don't settle out much at all. This is why I asked about vortexes and the like... and yes, a thread on energizing spray potential would be greatly appreciated. It's worth noting that my initial recipes try to match a similar percentage of targeted nutrient as can be found in the commercial products. Thus the manganese bionutrient ferment (Mn-BNF) contains 3.5% actual Mn compared to the 3% found in AEA's Rebound Manganese—whereas Agri-Dynamics' ECF-Mn proffers 8% actual Mn which explains why different rate considerations are also part of these comparisons to date. Nor am I overlooking fermented plant extracts (FPEs) as a source of plant-supplied nutrients, especially for something like silica.

The timing aspects of applying different nutrients is especially fascinating. What I've dubbed *nutrient pulsing* recognizes that "mineral capacity" in certain instances depends on a particular element being in good supply from the get go. Calcium is a great example of this, coming into optimum range during the critical cell division phase only if Ca levels in buds are prompted early on (perhaps even starting the previous growing season in late fall). Another part of this storyline is antagonisms between specific elements. Results from 2021 testing affirmed that Mn can block Fe uptake, and thus why I now rotate application of a manganese foliar and an iron foliar in the holistic spray plan. Similarly, excess K will hinder the uptake of Ca and Mg. There are other considerations here as well.

I'll be back shortly to speak more about [plant sap analysis](#) in general in that thread started in our Grower Research category. My goal this year is to take all this complexity and make it simpler... and not even necessarily dependent on plant sap analysis once certain rhythms in tree growth stages and the impact on consistent yields are more fully understood. All cool stuff!

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

Edited 1 time(s). Last edit at 01/03/2022 08:39PM by Michael Phillips.

[Reply](#) [Quote](#)

[Michael Phillips](#)

[Re: formulating assist](#)

February 20, 2022 10:54PM

Moderator

Registered: 11 years ago

Posts: 621

If any fellow mad scientists are indeed out there—you will now find more complete understanding of what I've been up to in a document entitled *Bionutrient Ferments* just posted in the [Secret Tattoo](#). Yes, only members in good standing can access these documents... and in that regard I thank all of you who are currently helping to finance network initiatives. You can learn more about the nutrient pulsing trials underway these past few seasons in this [plant sap analysis](#) thread. Anyhow, some of you get the sneak peek along with a chance to give me feedback. These methods can undoubtedly be improved upon so take heed that nothing is set in stone at this point.

[Lost Nation Orchard](#)

Zone 4b in New Hampshire

Edited 1 time(s). Last edit at 02/20/2022 11:00PM by Michael Phillips.

[Reply](#) [Quote](#)

[Steph Roth](#)

[Re: formulating assist](#)

June 17, 2022 10:54PM

Hello there,

Registered: 3 years ago

Posts: 7

I'm not sure where best to put this question - and I haven't exhausted the forum in looking for the answer to my question, but I'll put it here... and hope someone might shed some insight if they have had any experience with AEA? I'm contemplating enlisting in AEA to help figure some growing challenges at my nursery, since I feel the more I listen, research, and try to figure out what's really all going on beneath my feet the less I understand, and I can use a little help.

I'm hesitant to enlist in a specialist company that tells and sells what potions I'm to feed to my trees, as there are more than enough of those businesses around and I'm really wanting to figure out a closed loop system someday, using only/mostly inputs that we can produce on site, if possible. I guess basically I'm wondering if anyone has used AEA here and if it is a good* resource to turn to if I feel I'm needing a bit more guidance in this area?

*my definition of good being: informative, noticeable benchmarks/results, not going to break the bank

Thanks,

Steph

[Silver Creek Nursery](#)

Zone 5 in Wellesley, Ontario

[Reply](#) [Quote](#)

[Craig Bickle](#)

[Re: formulating assist](#)

June 22, 2022 03:28PM

Registered: 2 years ago

Posts: 82

I started using AEA's products this year after reading Michael's recommendations in the CO newsletters. The results have been noticeable. My trees don't have the leaf curl and frog spot problems that I've experienced on some varieties in previous seasons.

But I'm not signed up for their consulting services, so I'm not sure if I'd get even more benefit from following their spray/product input schedule by the book. I just bought some of their products and applied them in addition to the "Core Holistic Recipe" outlined by MP in the Secret Tattoo section of this site. Also, I'm in Ohio and we occasionally drive past the road up to the AEA plant in NE Ohio on the way to visiting my in-laws in Pennsylvania. Saved me a bunch on shipping costs.

Given the results, (noticeably healthier apple trees getting foliar trace elements and micronutrients) I plan to keep using AEA products in the coming years. If you (or anyone) uses their consulting services more intensively going forward, I'd love to hear about your experience. Thanks in advance!

Craig Bickle

Hap Woods

Zone 6a

East-Central Ohio

[Reply](#) [Quote](#)

[Steph Roth](#)

[Re: formulating assist](#)

June 23, 2022 06:18PM

Registered: 3 years ago

Posts: 7

Thanks Craig! That is helpful! We are still waiting to figure out what the cost will look like, and we're just doing our own MP/Nigel Palmer/AEA approach for now. I appreciate your feedback!!

I'll report back if we go ahead with aea and provide a review in the coming months.

[Silver Creek Nursery](#)

Zone 5 in Wellesley, Ontario

[Reply](#) [Quote](#)

[Charles DeVier](#)

[Re: formulating assist](#)

January 11, 2023 04:03AM

Registered: 1 year ago

Posts: 7

After reading many posts on this site and AEA (Advancingecoag.com), I ordered some products from AEA in summer of 2021. They were Spectrum, SeaShield and Rejuvenate which I mixed with rain water and poured around drip line of my fruit trees. My young orchard was started in 2017 and added too each year since, now about 40 fruit trees spaced 20+ feet apart with fruiting bushes planted between them. I previously had fertilized with 13-13-13 and some trace elements as shown on soil analysis.

During 2022, I did not use any poisons at all, but used a spray mix of basically in (2 gallons of water) ;

Neem Oil 1.5 oz

Liquid Fish fertilizer 5.0 oz

Microbes purchased per instructions
Molasses 4 cups
Liquid Kelp or Seaweed 2 Tbs
Soap 1.0 teaspoon
Epsom Salts 1.0 oz
Garlic Barrier 0.25 cup
Milk 1 or two quarts
Bt per instructions

The above mix was added to rain water and sprayed on the trees and bushes 10 days to 14 days through-out the summer.

Mid summer, I again purchased SeaShield, Spectum and Rejuvenate, added fish fertilizer and Organic Dr. Earth (with microbes) in a 55 gallon barrel with rain water and poured around drip line of all trees and bushes.

All the trees and bushes looked very healthy during the 2022 season. We had fruit to eat for the first time; peaches on two trees, apples on three trees, plums on two trees, chestnuts on three trees and sweet cherries on one tree. We also had a good yield on three blue berry bushes and 6 gallons of stemmed grapes from 4 Concord grape vines (now in 5 gallons of wine).

There was very little bug damage to the apples, none to the Arkansas Black. Some of the early peaches were wormy, but those fell, were gathered up and disposed of; the rest were almost worm free.

Our Granny Smith apple had a lot of Cedar -Apple rust on the leaves, but still put on a nice first crop of apples. Japanese Beetles hit the Sweet cherries and grapes, but in very low numbers and did no real damage. There was no bug or worm damage to the blue berries, grapes including table grapes, chestnuts, Juliet bush cherries, gooseberries and currents.

For 2023- I e-mailed AEA and ask what they recommend for the small backyard orchard/gardener. They said to use "Nutralive" products (two gallons for \$73) which is a micronutrient supplement and a microbial food source. I will order these; some I will use as a soil additive and some as a foliar spray, either mixed with the above spray mix or maybe alternating sprays. I don't know yet.

Bottom line; I was happy with the way our orchard looked. I need to spray the peaches more in early spring. We really enjoyed going into the orchard and eating fruit without any poison on it.

Charlie DeVier
Mid-Missouri
Retired farmer

[Reply Quote](#)

[Todd Parlo](#)

[Re: formulating assist](#)

January 11, 2023 06:34PM

Registered: 10 years ago

Posts: 301

I for one am thankful for hearing feedback on nutritional inputs (and testing). Perhaps we can up our collective scientific quality and add a bit of comparative trialing. So as we move forward why don't we leave a small section (even a few trees) as an untreated control, or alternatively managed one. No doubt adding amendments will give us a needed push to health, but a year's climatic and biological conditions can set a much different stage than a preceding period. This goes too for test results (as I have mentioned elsewhere) for sap analysis or dry TA . We will want to confirm, routinely, that accuracy. I won't mention labs but I have seen discrepancies in different tests but from the same TREE. I believe we should continue to give anecdotal information about our management/orchard experiences but I bet we'll learn even more if we dig a little deeper.

[Reply Quote](#)

[Steph Roth](#)

[Re: formulating assist](#)

January 11, 2023 10:36PM

Registered: 3 years ago

Posts: 7

Interesting!! Yes, I feel for me at least, until I have a decade or more of experience first hand observing action and effect, I appreciate the sap analysis and options with AEA; we've been using MP's base holistic spray 3x/spring and that's it since 2016 almost exclusively, with barely any alterations over the years. For the nursery and orchard it worked pretty well, though it's not perfect, and I think it's time to add a little more.

So far we are pretty happy with AEA and the products we've used from there, though we only began applying some sprays and soil drenches in August of last year specifically from them. We were quite happy with the roots this fall when we dug our nursery crop though, despite the crop overall being smaller there were some beautiful long, strong roots, I don't remember tripping over previous years during digging - and the distribution of roots evenly seemed improved. Though we had a fairly bad drought season last summer, which always holds back growth a little, so I wasn't under any illusion AEA (or any other product/brew we might have tried) could make up for that, having started so late. I do find it amusing different labs get different results though - everything is relative I suppose!

[Reply Quote](#)

[Newer Topic](#) [Older Topic](#)

[Print View](#) [RSS](#)

Sorry, only registered users may post in this forum.

[Click here to login](#)

This [forum](#) is powered by [Phorum](#).