



Soil Education Course Chapter 5 FAQ

Session #20: Biological Inoculation

1. Q: Can provide/revive be used to increase fungi? If so, how to do it?

A: ProVide **is** bacteria and fungi, it's an inoculant. It can be added to the system to increase the diversity. ReVive is a food source, I designed ReVive specifically to feed fungi so either as a soil amendment, usually a pound an acre, or as an ingredient in tea, as pre-treatment, or to feed the compost and then make a tea/extract out of that. You can add it to the tea itself to help it grow. It is specifically designed to feed the fungi.

2. Q: How often during the season should I apply Soil ReVive?

A: That's a very good question. It depends so much on soil conditions, on crop type. Usually I recommend an initial application at planting, through doing a garden or early spring if it's a permanent crop. And then usually 4 to 6 weeks into the growing season, added again if it looks like it might be necessary. And then in the fall, post-harvest, to help with the building up of the fungi to help break down the residue in the organic material. But at the same time, we have some customers who are doing it weekly. Those are the extremes, a couple of times a year to every week. If you're going to do it every week, do a much, much lower dose than what we recommend. Generally, ideal 2-4 lbs per acre, per year.

3. Q: Robert Pavlis' (Soil Science for Gardeners) book states that the ions are the same in organic and synthetic fertilizers. Therefore, is biological inoculation 'good'?

A: What that book argues... that's purely chemistry. That's just elemental information on those compounds, whether it's naturally occurring or synthetically produced. Those ions are there. The question is: what else is there and how is it impacting the plant? A lot of "organic" gardening is really just conventional gardening, substituted with approved products. If you're not taking care of biology, then it hardly matters. If you don't care about biology, the question is what are the outcomes of using some of these synthetic fertilizers? Sure, you can get plants to grow, that's never the question. Current agriculture can feed plants and make them grow, but they're junk, right? And it destroys the soil, destroys the environment, they're heavily

petrochemical intensive, so... That system myth, it's just wrong. That's a statement that is just wrong because it takes the 'bio' out from biochemistry. It's only looking at the chemistry perspective. So yes, you want inoculants. You want the biology to eat those nutrients and then convert them into forms that the plant can utilize without forcing the plant to take it up. (That's why salt based fertilizers work. They pull the moisture out of the plant, and then replace it with that nutrient, and that's not how plants naturally feed.)

4. **Q: How much tea/acre do you suggest applying on crop land? Does it just depend on the scenario as to the quality of tea and needs of the specific soil? Any way to generalize it? Hard to get farmers to pay for tests on a regular basis.**

A: The best case scenario is to test the soil, test the tea and apply appropriate amounts accordingly. But, the general rates are 10-20 gallons per acre, 3-4 times per growing season.

Session #21: Soil Amendments

1. **Q. Do your ProVide & ReVive products both have Humic Acid?**

A: Only ReVive. ProVide is strictly bacteria and fungi.

2. **Q. Are trace minerals in ReVive?**

A: In ReVive there's probably some trace minerals from the kelp and the carbohydrates that we use in it but nothing that we've measured so I can't can't speak definitively to it.

3. **Q. When I use alfalfa meal in my worm bins, I often get large growths of fungi. Why does alfalfa promote fungi growth?**

A: I have no idea, it's probably that there's a lot of nitrogen in it, but there's also a lot of carbon and plant growth promoters that might be stimulating the fungi. So I don't know specifically why that fungi growth would stem from the alfalfa as such.

4. **Q. How frequently and in what quantities generally do we need to apply biostimulants and amendments throughout the season for maintenance? In general of course, considering we don't have any specifics about soil etc.**

A: Yeah that's a really interesting question I usually recommend... a maintenance mode. Just like usually half or a quarter of the normal recommended application rates. For example, ProVide and ReVive per acre: usually recommend a gallon and a pound per acre, 2 or three times during the year. Well, if you're in a true maintenance mode, maybe you just do a quart and a quarter pound once, and then if you run into any specific problems, you might do another application, just light. Part of the goal is to get it to as minimal as possible. That's challenging in a man-managed system. You're always harvesting and busy, so there's always a need. As little as you can get away with. I bet it would even be possible to skip years and do nothing. Maybe every

other year. It's really going to come down to your experience, and your needs and your comfort level. For some of our cannabis growers, and greenhouse people, they're putting it out in small doses every week, no matter whether they need it or not, it doesn't usually hurt anything.

5. Q: Has Earthfort evaluated the claims or the product for Sea-Crop?

A: Some with Sea90 but not Sea Crop specifically... I did some bench testing for some folks, with the secret of the Sea90. And is a synergistic component. It seemed to help with the bio stimulant, but we didn't do plant growth. It's hard to evaluate some of those claims. Because you're putting out such a small amount, that it's almost impossible to identify a direct benefit. Also, those are almost never done by themselves, so there's always other products going with it. As part of a complete breakfast, I'm sure it's a great tool.

6. Q. Is rock dust a salt?

A: It depends on the source and the form it comes in. Granite powder, for example, is not salt, it's just pure rock mineral. There might be some salt in it, but by definition, it wouldn't be an actual salt.

7. Q. I believe you spoke of this previously, but do farmed fish products contain chemicals that could be harmful in the soil?

A: All of the things probably contain something that could be harmful in the soil fish products that are required to be tested for heavy metals and for other toxins. Fish products are required to be tested for heavy metals before they are allowed to be used. So if you're buying a commercial product that's properly registered, there's no concerns. According to the EPA, the USDA or whatever Department of Agriculture is checking it. If you're getting your own fish to process, then who knows.

8. Q. Should we be worried about any toxins in the fish from ocean contamination?

A: There is always a potential for some sort of contamination, but properly tested and registered products will have much less chances of contamination.

9. Q. Do you have to wash off salt water to use fresh sea kelp?

A: I don't think so, it depends on what you're doing with it. If you're chopping it up and feeding it to the worms, I don't know if that'll make much of a difference or not. Otherwise, it might be a good idea to rinse it.

10. Q. Is it helpful to apply either stimulants or amendments to compost in small quantities to improve compost quality?

A: You can do that. A lot of people will get their analysis back from the compost and they'll say "oh, I want more fungi" So they might feed it some fungal foods. Also they'll look at the NPK and what a lot of people, a lot of compost operators, they'll custom-blend the compost with the nutrients that the customer wants. So if a customer wants a particular mix of things, they can say, OK, here's my base material,

let's say it's a 2:2, and they wanted to be 5:2. You might add some alfalfa meal or fish or something to it to help bring up the nitrogen content, but you gotta be careful when you're mixing those things in, especially nitrogen. It could restart the compost process by introducing more nitrogen into the pile, then the biology will eat it and then you end up with the nitrogen because they ate it all. So there's some risk to that.

11. Q. In your compost, does it matter whether you use organic oat vs. 'Regular' oats?

A. Organic is good, it basically guarantees no harsh chemicals are used, and pretty much guarantees it is not GMO. Steel cut oats! So I would always err on the side of organic just to minimize potential problems.

12. Dicamba, 2-4D, and glyphosate are often used 2x a year on corn and soybeans, how's that affecting soil long term? Will ProVide and ReVive reverse some of that?

A. If you're doing that kind of agriculture, it becomes a transitional process to go from what you're currently doing to what needs to be done. With ProVide and ReVive, you can offset some of the unintended consequences you can chelate some of those salts once the glyphosate is taking care of the weeds. You can go in and it will break up that salt. But it definitely has a negative impact on biology over time. One dose of Roundup is not going to wipe out your biology. But if you've been using it for 20 years and rotating, then you're going to have a negative impact over time. 2-4D is pretty bad. These things are not selective either, so they tend to have unintended consequences on a lot of the life. Apply the chemical, come in and plant, provide and revive to undo the damage. It doesn't really build the soil. It's just undoing the damage. And so, it kind of becomes a tool in a conventional mindset. But if the farmers are interested, we can then work on a process of reducing the amount of Roundup reducing the need for the 2 4 D by reducing the stress on the system. So it's just a process, it just takes time and the farmer has to be really willing. Next week, our session will cover that -- "How To Transition."

13. Q. What is the rate of provide/revive needed to keep my Dragon fresh? Chickens?

A. How big is the habitat? How bad is the problem? How big is the dragon? Because if it's just a little baby one, it probably doesn't need much, you just do a light application over the top of the soil.

14. Q. What is the difference between seaweed and kelp?

A. A lot!

<http://www.differencebetween.net/science/nature/difference-between-kelp-and-seaweed/>

15. Q. What is the rate of application for fish/kelp?

A. Depends on the products and the intended use, I often recommend 2-3 gallons of fish per acre as a broadcast fertilizer.

16. Q. How much Alfalfa in your worm bins?

A. The answer to this question is going to be based on the worms. Basically, as much as they will take without a) getting sick, b) dying and c) leaving the bins or d) they won't eat it...so start small and build up over time. The worms will guide the process if you pay attention to what they have to say about the whole thing.

Session #22: How To Transition

1. Q. I've been using ProVide/ReVive/Pacific Gro for a number of years. Little did I know the products could mitigate dragon bacteria, wireworms & silkworms? The respective labels do not mention these. Are the products directly responsible or indirectly since the plants are healthier?

A. So it's kind of both. Labeling laws are very restrictive. I can't put on the label the bio pesticide components of Provide, because otherwise, I'd have to go through EPA registration for that. So I get an exemption, because all these organisms that we are claiming have other functions. So trichoderma, for example, is a trytodore, it breaks down organic matter, but it also combats fungal diseases, bacillus, and pseudomonas. Both of those are known to be plant growth enhancers. So they help the plants grow, but they also have bio control properties, bacillus thuringiensis, for example, in Pseudomonas. There's several varieties of Pseudomonas that are also excellent pesticide control. I don't put Bavaria on the label. There's Bavaria in there and Bavaria is a fungi that's very effective at helping to mitigate the pests, the insect pests, soft bodied insects in the soil. Also, the chitinous eating bacteria that are present in the biology can help control soft bodied insects. So, the answer is, yes, but we can't label it as such, and there's other functions, and the goal is not to kill things, that's why, that's why we put this life focused approach. I don't want my product to kill your bugs. That's not the point. The point is to build the soil and to make this soil function, so that the plants are more able to resist the pressure from these insects and these diseases. If the system is healthy, they don't get sick. If you're not stressed and you're getting nutrition, you're not susceptible to disease. So that is the real goal: to build up the health of the soil. So, John, you're seeing both effects. There is some bio control component and there's also, but primarily, it's the soil health component. Building up the diversity and not allowing any organism to dominate and also to reduce stress on your plants.

2. Q. How do chemistry and biology line up for a transition to a Life Focused Approach?

A. We want it to be focused on building a living, thriving, dynamic ecosystem, even if it's just our backyard, or a thousand acres of pasture. You look at the life and the soil, you look at the life of the plants, you look at the life of the animals interacting with that system and we focus on that. As opposed to focusing on how do I maximize my yield, or how do I kill my weeds, or kill my pasts, or how do I make my animals fatter? Those are important things to consider, of course, but OUR focus is on building life, and building a functioning soil. That is the primary focus. And also, building a functioning, integrated system, so that ALL of that life can thrive.

3. Q. How did biology combat the wireworm and silk worm problems?

A. Mostly answered in #1. When you spray the biology on the surface of the plants, there's biology that lives on the surface of those plants too. So we've talked about the soil microbiology, but there's also the plant surface microbiology, the foliar food web that lives on the surface of all those plants. If they don't have biology on the surface of them. That opens them up to potential disease. Just the presence of those microorganisms deters the insects from coming or it scares them away. If you have an infestation of insects and you spray ProVide on them, what we don't see is a bunch of dead insects, right? So that's a bio control. You go in and you kill all the insects... Well, ProVide doesn't do that. But what we do see is a diminishing of the population, not a death. So that means they're leaving, we're discouraging them.

4. Q. When you mentioned a soil test, can one use a simple soil test, e.g. the bottle sedimentary test?

A. When you take soil classes at university or look at what the USDA recommends for soil testing, from my perspective, those are moderately useful tests. So tell me, what's the information you're getting from doing a sedimentary test? Oh look, I have sediment, I have layers, I have sand, silt, and clay components. That only tells you how much you can till or not.

When we really think about it, what is the physical properties test telling you? It's just whether or not you should till. Water infiltration tests... that can be useful. But why? Why is my soil infiltrating water at this rate? Why is my soil doing what it's doing? I've got too much clay. Why do you have too much clay? Well because that's a physical property, then you have to ask the question, does grass grow in clay? or sand? or silt? or perfect loam? What does grass need, what do our plants need? It turns out plants will grow in any soil type, under any conditions if the climate is good. Some soils are destroyed beyond recognition and they won't grow anything, but the physical properties do not limit the ability of plants to grow. The lack of biology in those systems, and the lack of available nutrients does.

Session #23: Live Group Session - GoToMeeting (Unrecorded)

1. Q. What are your suggestions for mid-year improvements to make in order to improve the fungal content?

A. Feeding the soil with ReVive or fish can be helpful, or the addition of fungal compost, a light top dress of 25 pounds per 1000 sq/ft.

2. Q. Is it necessary to use local materials for your compost? Does using indigenous organisms help the compost to function better in your environment?

A. The short answer is yes, of course, but it is not very practical. It is best to combine local and what you have available to you, with the utilization of components outside of your current reach. Earth is a global, closed-loop system -- let's work together and use it to our advantage!

3. Q. How do you recommend we establish base levels at the beginning of a project?

- A. Test your soils, compost and teas. Send in your samples at the beginning of a project for the Advanced Biology Test to establish a baseline. It can also be useful to ask for recommendations from your local co-op.

Session #24: Review Session

1. Q. I'm told that crop rotation is important. But the forest doesn't have any obvious rotation. How then, does the forest stay healthy?

A: Cover crops! The natural diversity is what we are looking for, the forest does not need to rotate because it is in an evolving state at all times. When you look at the diversity of plants, if you go into the forest in the early spring, it's a different set of plants than it is later in the season, and there's so much diversity. For example, walnut trees can limit certain biology themselves, and utilize their own biological warfare resources to kill off everything that might be growing underneath and competing with that tree.

2. Q: I know what I am trying to do, but I get people asking if I am doing permaculture, biodynamics, etc. What do I say to them?

A: You're probably doing some of both -- permaculture is focused on how to build things that work together in a symbiotic way. I'd say you're doing a practice focusing on the living components, and that you're focusing on diversity of practices. You may use some chemicals so that your roses will stay alive and thrive, but you're also practicing some biodynamics methods, and focusing on creating a balance in the soil.

3. Q: I was collecting seaweed the other day when a person came up to me and said that you shouldn't be doing this. It seems that educating people is a big job, how do you do it?

A: First, I would check and see if maybe there is an ordinance in the area, I'd make sure it's legal to be doing what you're doing. If it's dead seaweed, obviously it's broken free from the kelp forests and washed up on shore so there is no harm in gathering those minerals for other use.

4. Q: Working with customers, what would be the first thing you could suggest that he or she do for their landscape?

A: Ask the customer what their goals are for their landscape. Help them identify what is a problem, and determine how to measure changes. Then, you can focus on solutions, and determine which steps to take. Consider what might improve the soil based on their soil sample testing results.