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improve the soil, say goodbye to pests?

Posted by [David Maxwell](#)

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[David Maxwell](#)

[improve the soil, say goodbye to pests?](#)

March 16, 2013 07:01PM

Registered: 11 years ago

Posts: 197

Eliot Coleman has preached for years that we should not be trying to kill the bugs, which are the "symptoms" of ill health in the soil, not the problem themselves. Rather, we should look to improve the soil, so the plants can defend themselves. This certainly seems to be valid in his hands but he is growing market vegetables, and he is able to continually modify his soils, with crop rotations, green manures, huge amounts of compost, etc. I note a posting in the Bug to Bug forum about an organic blueberry grower who has no appreciable SWD damage, while surrounding conventional growers are devastated. A manifestation of the same phenomenon? How can we tree folk achieve the same effect, with soils which, in contrast to Eliot's, are undisturbed for their lifetime? In other words, can we eliminate the need to spray anything against insect pests by simply fixing the soil health for our tree fruits?

[Broomholm Orchard](#)

Zone 5b in Nova Scotia

Edited 1 time(s). Last edit at 03/17/2013 12:34AM by Michael Phillips.

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[Brian Caldwell](#)

[Re: improve the soil, say goodbye to pests?](#)

March 18, 2013 12:47AM

Registered: 10 years ago

Posts: 69

This sounds so attractive, but has been elusive. Or am I wrong--is anyone willing to share an approach to soil management that nixes apple pests?

Perhaps the best we can hope for is for optimal soil so that trees resist pests up to their total capacity, but that we will still have to spray some to attain our high human cosmetic standards. ?? What do you think?

[Hemlock Grove Farm](#)

Zone 5 in New York

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[Todd Parlo](#)

[Re: improve the soil, say goodbye to pests?](#)

March 20, 2013 07:37PM

Registered: 10 years ago

Posts: 301

Soil management, or foliar sprays to boost tree or system health I would imagine we all agree is a helping hand. A good analogy here would be to look at the human being. A good diet, exercise, vitamin supplements, sunshine and even good genetics are going to help us all with the battle. Now enter plague, malaria, cancer, and Siberian tigers. The healthiest individual on the planet is going to do squat for these intrusions. The info out there on pumping up the health of the system is about nuances in my opinion, and if we are not too greedy about the outcome (be it fruit condition or yields) it may be enough. I really hope that folks on the nutrient dense bandwagon have some luck, and I think we would be crazy not to make our plants as healthy as we can, but I cannot support the idea that drosophila or Japanese beetles or fireblight is going to look twice before squashing those healthy plants. Our task as I see it, is to try to tweak the system and report back for all to read. I just hate to have folks hope too much for magic bullets. There are organisms out there that are evolving not just around pesticides, but around healthy plants and ecosystems as well. That cosmetic standard, again, is what is really making this difficult, and what is keeping us from peacefully living with the rest of the creatures out there.

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[David Maxwell](#)

[Re: improve the soil, say goodbye to pests?](#)

March 21, 2013 02:21AM

Registered: 11 years ago

Posts: 197

I am in entire agreement with Todd. And yet... here is this guy Eliot Coleman not only preaching that with maximally healthy soil there is no disease or insect attack, but making his living in market gardening, (where cosmetics are just as important as in tree fruit), and doing it. And the blueberry grower. And even those abandoned apple trees in the woods up the road from me which are producing copious unblemished fruit. (I can't get anywhere near as perfect fruit as on these ancient trees in my carefully tended orchard.)

Just in passing, there is no evidence whatsoever that the average North American derives the slightest benefit from supplementary

vitamins, (speaking as a physician). (There is one exception- pregnant women profit from folate). I do wonder whether the same can be said for some of the potions we spray on our trees, which is why I am enthusiastic to actually test it.

Your mention of genetics may be relevant. Many years ago I tried to grow White Leghorn chickens in an Indian village. The damn things died of every conceivable malady, (and a number of inconceivable ones), and even managed to break their necks when they fell off their perches at night. In essence they had had all disease resistance (and even rudimentary intelligence) bred out of them, in the interests of one function - laying eggs. (300/year vs 6/year in the average Indian village hen). Is this same phenomenon at play with our selected apple cultivars?

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[Paul Weir](#)

[Re: improve the soil, say goodbye to pests?](#)

March 23, 2013 02:37AM

Registered: 11 years ago

Posts: 187

I agree with your last statement wholeheartedly, David.

"Is this same phenomenon at play with our selected apple cultivars?"

Yes! There is no doubt in my mind that a good number of the mutant variant apples, e.g. bud sports, that we humans selected over the last century and a half were not always for the sake of "better" or "truly more capable", but rather for pure esthetics, raw production for a given purpose and maximum profit -- no other thought was given to the fact that when one gene turns on or off, it may not be the only one doing so. Hundreds of genetic changes may have come with this new variant.

A parent tree, a tried and true variety that normally seems relatively pest or disease free randomly puts off a new dark red mutant sport of itself which is then eagerly selected for by an observant grower . . . the beholder is so enamored by the beauty of the new fruit that it doesn't come to his/her mind that this apple may actually no longer be the parent tree at all, but a much less capable version. . . . a genetic defect, if you will.

This mutant branch that should have probably just been pruned off, is instead elevated to superstar status and becomes that parent variety, in the court of public opinion. Over time, the historic variety, the original tried & true variety, has faded into obscurity and we are left with this weaker (sickly?) substitute that continues on in a familiar name only.

With those corners inadvertently cut has come the weaker (or at least questionable) genetics and susceptibilities often seen and likely now ubiquitous in many orchards worldwide.

If many of the nouveau commercial varieties being grown are genetically defective, I don't believe any amount of nutrient dense pro-action will stem the inevitable beat down that those trees and orchards will suffer in the long run.

[Gopher Hill Apples](#)

Zone 8 in California

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[Jeb Thurow](#)

[Re: improve the soil, say goodbye to pests?](#)

July 31, 2013 10:59PM

Registered: 11 years ago

Posts: 15

Improve the soil, say goodbye to pests?

This is a really great post, which brings up numerous questions. I have been asking this same question and doing what I can to understand this whole idea of nutrient density. There are so many books that elaborate on this subject, how, if you get the nutrients built up in your plants that you can stop pest and disease. If you look back at some of the authors of the 30's and 40's like Fukuoka, Howard, Albrecht, and Reams you see many of these questions being asked back then. We all have different challenges in our growing regions so we will all have different approaches. In the Pacific Northwest (PNW) we have the maritime climate that gives us cold wet soils till June most years, and light conditions in the spring that are less than optimal.

So the question I asked was "How can I grow nutrient dense food in the PNW?" I decided to head back to school during the winter months to get a couple of answers and to get access to a library. Because I don't want to get too long winded on this one post I want to toss out a couple of thoughts just to get the ball rolling. The reason I look at nutrient density is because of what I heard at a bio-ag conference last year where Dr. Jill Clapperton talked about the relationships in the soil and how they are so important to nutrient cycling. We need those predator-prey relationships that occur in undisturbed soils to release the nutrients that the microbes are collecting. This was followed by a fella named John Kempf that did a great job of explaining how nutrient cycling is so important to healthy crops. His main point was that disease and pest is a result of inadequate nutrition at the proper time. Plants produce the simple carbohydrates during photosynthesis that then combine with the other nutrients to form the enzymes and amino acids that make the proteins needed in the plants. He used the example of a chain; if any link was defective then the chain was weak and allowed for pest and disease.

I have always found Albrecht's ideas on balancing the soil minerals interesting but wondered how can I apply mineral balancing to fruit trees in the PNW compared to the research he did on row crops in mid-west? That is where I decided that for my orchard I was going to put my energies into building the soil flora and fauna to "manage my soils" I know it is unpopular not to go for instant results these days but many of the papers I have read suggest that moving to no-till systems can take three to five years before you see results. I'm hoping that since I am starting with undisturbed forest soils that I might see results earlier.

So my game-plan is

1. Get a soil test and Balance the minerals
2. Build soil life with mulches and living mulches
3. Add the understory plants to heal the soils

I know that I am just touching the very tip of some big ice-bergs but I find this whole idea interesting. David as a doctor I would like to get your thoughts on Dr. Arden Andersen's book Science in Agriculture If you have seen it. And Todd I agree with you that there are no magic bullets. It is going to take something that our forefathers took for granted, Observation. I am amazed at how many products have popped up in the last twenty years to "FIX" problems.

One of the meta studies I found had this to say about nutrient density "The three elements that influence nutritional value the most, and that scientist do agree on is; Environment (to include, soil type and structure, fertilizer type and application method, climate-light, temperature, rainfall, humidity, soil microbial populations, management practices), Genetics (i.e., Plant crop and cultivar), Post-harvest practice (harvest time, handling and storage, processing methods and conditions)." (Bourn 2002)

Bourn, Diane and John Prescott. "A Comparison of the Nutritional Value, Sensory Qualities, and Food Safety of Organically And Conventionally Produced Foods" Critical Reviews in Food Science and Nutrition, (2002) 42(1):1-34 print

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[David Maxwell](#)

[Re: improve the soil, say goodbye to pests?](#)

August 01, 2013 12:42AM

Registered: 11 years ago

Posts: 197

Nope, I am not familiar with Science in Agriculture, (and it is not listed in any of the public library catalogues here, nor in any of the university libraries, including the Agriculture College.) Sorry, I can't comment.

My impression currently is that resistance to pests has a lot more to do with cultivar than with soil. For example, with 50-odd different cultivars growing in an area of 1/4 acre, (and hence probably all in pretty much the same soil), some are completely free of attack by European Apple Sawfly, while others have up to 30% damage, (and in past years, 80%). The resistant ones have neither spatial nor phenologic (ie. time of flowering) relationships, and, obviously, also share the same soil.

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