

Q & A: From 2015



**Reverse Osmosis to harvest sap from maple trees**

**Q.** Eric, give me some more details on how you used reverse osmosis to thicken your maple tree sap? Tania built a rocket stove years ago to cook our maple sap, but it took forever. What you mentioned piqued our curiosity. Gene

I hooked up three under-the-kitchen-counter RO filters in series (not in parallel) and used a pump to push the sap through. We got the idea from this website:

<https://sites.google.com/site/mattatuckmadnessmaplesyrup/home/homemade-reverse-osmosis-system>

and implemented his low- budget schematic. The main challenge is to get your connections between different fittings leak-proof. Connections from plastic tubing to brass fittings like the pressure gauge or the needle valve were very tricky to get leak-free (wrapping Teflon tape works well). But at the end of the day it worked and we managed to get leak-free operation. I'm sure we will go through quite a bit of system tune-ups this year as well.

By the way, you can farm other tree saps as well. Check out:

<http://farmingthewoods.com/2015/03/12/tree-saps-expand-the-range-potential-of-forest-farming/>

Best,  
Eric

## **Grafting tomatoes**

**Q.** I've heard you can graft tomatoes. How does one do this? Karl

Here is a good online tutorial on how to graft tomatoes. It requires that you germinate seeds for the rootstock and seeds for the varieties you want to grow separately and match the seedlings with similar stalk diameter.

<http://www.johnnyseeds.com/assets/information/tomatoes-top-grafting-vigor-disease-resistance-8973.pdf>

## **Gooseberries**

**Q.** Almost 20 years ago my sister in the Washington area changed homes, and we saw a little gooseberry bush in her front yard. We took a cutting home, and two years later it was 7 feet high and 5 feet wide. Her bush never did well, but ours produced so much that we sent her a gallon of berries every July, which she really enjoyed. Then, 5 years ago, my sister got sick, and our bush produced at most half of the earlier amount. When she died two years later, our bush did too. In the spring, we still get a few leaves sprouting, but with the first rain they fall off. Could there be some telepathy between people and plants? This is more of a spiritual than botanic question. Gert

What a fascinating story about your gooseberries! The coincidence is remarkable! A few thoughts and questions:

1. In memory of your sister, you might try to grow another plant by taking a few cuttings in the spring (say, 4" or so), from any remaining branches that sprout, stripping leaves except for the top bud and a couple of side leaves, and putting these in some potting mix (with rooting hormone if you have any). The spots where the removed leaves were contain stem cells that can become roots, leaves, or fruit buds. Make sure you bury these in your potting soil. If the stem produces any white blossoms, pinch these off carefully. You can also use layering of low branches close to the ground to propagate it.
2. What is the habit of your bush -- one main trunk with many branches? Multiple and spreading habit?
3. Do you prune your gooseberries? Most gooseberries require annual pruning, and this pruning is different depending on the answer to question 2. For bushes with a spreading habit, you want to cut to the bottom those canes that are four or more years old so that the plant produces new canes from the bottom. Absent regular pruning, the shrub gets leggy and productivity falls off. You can try rejuvenating an old shrub by pruning heavily, cutting back all older cane, and leaving only new cane, and tip-pruning the ends by several inches or more to reduce legginess or blind wood (intervals of cane with nothing growing on them).
4. Gooseberries and currants are heavy feeders, benefiting from heavy compost and potassium (we use greensand, or sul-po-mag).

## **Snap peas**

**Q.** The biggest problem we have had in the last 2 to 3 years has been with the sugar snap peas, our favorite vegetables. We try to start them in the windowsill, which gets good sunshine. We use Burpee seeds, but in the last two years the sprouting success has been at most 10 percent. And even the few plants we have coming up have not produced like they used to in earlier years. What could we be doing wrong? Gert

Assuming you are using your own soil to start the peas, you may be experiencing what we did in the early period: poor germination and rotting peas in the ground with direct planting due to pathogens in the soil. We solved the problem by sprouting peas in a 50-50 mix of sand and peat moss in a flat in our mini-greenhouse. This is a sterile mixture, so disease organisms do not kill the peas. On germination, we then transplant to our bed. It's extra work, but otherwise, our germination rate is 5-20%. Heavy clay soils do not help.

## **On repelling voles and meadow mice**

**Q.** How do we get rid of voles and meadow mice?

Hit them fast and hard, and keep at it. Cats are best, but absent that, here are some devices that could help. See also <http://www.havahart.com/vole-facts> .

1. Underground sonic repeller I used this summer and winter. P 7907 battery operated mole repeller. These seem to work better and last longer than solar-operated ones. Some years they worked well, other years (2015) not so well. Voles can produce 15-60 young per year, primarily in spring and summer. For 2016 we are trying a combination of the three strategies suggested here: sonic repeller, windup traps, and snap traps.



<http://www.amazon.com/P3-Super-Sonic-Molechaser-P3-P7907/dp/B0006M1YHK>

2. Windup (live) traps at Farm-Tek:

<http://www.farmtek.com/farm/supplies/ProductDisplay?catalogId=15052&storeId=10001&langId=-1&division=FarmTek&productId=15853>

<http://www.farmtek.com/farm/supplies/ProductDisplay?catalogId=15052&storeId=10001&langId=-1&division=FarmTek&productId=15851>

Small problem: chipmunks sometimes get stuck in these traps. They are stronger than mice, and try to get out of the trap through the side crevice. They choke to death, and it is a job to extricate them. I use rubber gloves.

3. Improved snap trap: at Ace Hardware (but you can get just one pack at the store). With these, you smear the bait (e.g., peanut butter) underneath the top half. The mouse has to stick its head in and up to find it -- WHAMO! Works most times, and you just squeeze the other end to open the trap, and the mouse drops into your burial plot.

<http://www.acehardware.com/product/index.jsp?productId=1280339>



### **Black rot of grapes**

**Q.** After two years of a great harvest, my concord grapes succumbed to black rot last year. I sure would like to prevent that this year. You have any good ideas or sources I could check out? Cindy

Another gardening friend of ours lost most of his crop to black rot last fall, too. In our exchange, I learned that he had never pruned! What he had was a bird's nest of brambles which reduced air circulation. Do you prune? What is your trellis arrangement?

You probably had small amounts of black rot from the previous year, but may not have noticed it. The dried mummies fell to the ground, and sporulated last spring, spreading the disease during the season. I would recommend the following:

1. After you prune, rake off all debris from beneath the grapes and bury this debris.
2. Add whatever compost and amendments you normally add to the grape bed.
3. Mulch! The reasoning here is to cover any black rot pieces and spores left behind from your cleaning, as well as to help the soil retain moisture and keep down weeds.
4. Spray with copper. This will kill the spores on the cane. The traditional antifungal is called Bordeaux Mixture, but a copper soap will do. If you can't find a copper product at your garden supply center, get a canister of copper soap from Gardens Alive. That's

what we use. (<http://www.gardensalive.com/product/soap-shield-flowable-liquid-copper-fungicide-3>)

5. Spray in late winter, again 10 days before and after bloom, and then at fruit set as needed. You don't want to spray the blossoms! One year I did and damaged them (I may have been using sulfur, which is something else you can use as an antifungal). The blossoms are tiny! Scout the grape vines for grapes beginning to show black rot, pick these off, and bury. When you spray the fruit, I have found that the copper soap may not stick to the grapes themselves. I add a sticking agent. I use Murphey's soap, because we have that around the house. A bit of traditional Palmolive green dish soap will also work. It takes weekly monitoring to keep ahead of it, especially in humid, wet weather as we have these past two summers. As the grapes mature, they outgrow susceptibility to the fungus. Make sure you spray the leaves and stems, too, as these may carry fungal spores.

6. In section 3.3 of our Organic Garden Primer we have a brief section on grapes starting on page 48. On <http://www.neo-terra.org/organic-gardening.html>; scroll down to Key Topics on Organic Gardening and click on item 1. Organic Gardening Primer, then go to page 48.

7. In case you might not recognize black rot in its early stages, here are two links to articles on black rot of grapes. In the first link you will find a pic of a badly damaged cluster -- with many spots. In our case, I rarely see grapes with more than one spot, and perhaps that's because we scout regularly and frequently. Also, concords are less susceptible to black rot than other varieties.

Click on the pic to enlarge. Farther down the article, you might pick up a few more tips - e.g., disposing of pruned cane, which may also harbor black rot spores.

<http://www.missouribotanicalgarden.org/gardens-gardening/your-garden/help-for-the-home-gardener/advice-tips-resources/pests-and-problems/diseases/fruit-spots/black-rot-of-grapes.aspx>

The second article is a pdf from Cornell University Extension with many pictures:

[http://nysipm.cornell.edu/factsheets/grapes/diseases/grape\\_br.pdf](http://nysipm.cornell.edu/factsheets/grapes/diseases/grape_br.pdf)

What I learned is that the disease can also take up residence on leaves and shoots, in addition to berries, and spread that way as well! Cleaning of diseased material should also include leaves and shoots. Spraying in the early season must also include these in the program, not just the grapes.

So check your leaves and shoots!

## **Grass Seed**

**Q.** I wanted to follow up on my note to you about the stubborn plantain weeds in our backyard. I did put cardboard and straw on them in the fall and have killed them. I am wondering if you know of any company that sells grass seeds that are not treated with noxious chemicals. Yaw

Your question regarding untreated grass seed threw me: I hadn't realized ordinary grass seed was being treated with chemicals!

Gardens Alive sells many organic and environmentally benign garden and lawn products. I have used several of their products for years, including sulfur and copper sprays, and natural pyrethrin-oil blends for occasional pest outbreaks. They have their grass seed selection here: <http://www.gardensalive.com/category/grass-seeds> Double-check by contacting them to confirm their produces are not treated or pelleted with chemicals.

I came across this informative article putting the lie to a common name used for grass seed -- "Penn State" (sunny or shady): [http://www.donnan.com/Penn\\_State\\_Mix.htm](http://www.donnan.com/Penn_State_Mix.htm) Keep this article in mind when looking for local sources. You might call Centre Hall Farm Supply at 364-1393. They are on the main street in Centre Hall -- an old-fashioned farm store. They may have bulk grass seed. What you are looking for are blends of Kentucky bluegrass and fescues. You want to avoid mixes with perennial rye seed greater than 20-25%. Of course, ask whether the seed has been treated with chemicals (probably fungicides), or is pelleted (usually done with a synthetic fertilizer).

Other local sources would be Ace Hardware, Lowes and Home Depot, but I don't know whether or how these have been treated.

On tips for planting grass seed, I came across two items:

1. <http://www.rodalorganiclife.com/garden/your-6-step-organic-lawn-plan>
2. <http://www.lawngrass.com/states/pennsylvania.html> ; which has "Guides & How To" in the right-hand column.

Yaw, this may be more information than you want!

## **Dry farming grapes and almonds**

**Q.** Not long ago there was an informative local article in our paper. An organic wine grower explained that dry farming is all about root structure. He explained that grape vines adjust to the amount of water they are given. With less water, the vine builds a more extensive root structure that makes the plant tougher and able to deal with limited water availability. But provide excessive water and, as he said, the plant becomes a water addict.

It was a simple but great explanation. Since root structures are not visible, hardly anyone thinks about them or understands them except people knowledgeable in the field. But the root structures, like many organic processes, respond to their environmental conditions including water availability. The article gave me information that I can use now when I explain to people about dry farming. What's your take on this? Chris

I noticed yet another comment in the media blaming almonds for the drought in California:

"If you're a meat-eater like me, listen up. When you bite into a delicious burger, it took [1,847 gallons of water](#) to make just one pound of beef. Do you like almonds? Well, it takes about [1.1 gallons of water to grow a single almond](#). You get it"

The above comparison borders on idiotic. I did some math to make this data more comparable -- on a pound, caloric, and gram protein basis. Here are the results:

	<b>Gallons water/ lb</b>	<b>Calories/ lb</b>	<b>gms protein/lb</b>	<b>Calories/gal of water</b>
<b>Almonds</b>	<b>387</b>	<b>2,713</b>	<b>84</b>	<b>7.0</b>
<b>Beef (hamburger)</b>	<b>1,847</b>	<b>1,216</b>	<b>81</b>	<b>0.66</b>

Almonds are the winner by every measure! GROW ALMONDS! Even better, return to dry farming. Almonds were traditionally grown that way. When I showed this comparison to John Jeavons, he replied that hazelnuts/filberts are five times more water efficient than almonds!

You're absolutely right about dry farming of almonds and grapes. I remember traveling along the Adriatic coast in the summer of 1971. I would pass these small vineyards on the hills facing the sea. It was a Mediterranean climate! All dry farmed. Same in southern France. We just keep departing further and further from a reality based on nature. Ivan Illich used a thinking method based on unwinding the present and going back in time when ideas (and practices) we consider part of modernity disappear. It is a fascinating exercise. We moderns, Illich pointed out, think that the way things now are always were. Not so!

Wendell Berry does this with industrial agriculture. Farmers would scratch their heads and wonder why industrial farming wasn't working for them, yet it was promoted as the "right thing to do" by the USDA and extension agents. Recall Nixon's Sec. of Agriculture Earl Butz' phrase, "Get big or get out!"

Perhaps out of this drought in California, vegetable production will move back to wetter climates where it used to be. Closer to population centers. Following the old practice of truck farming, whose contemporary equivalent is your local CSA.

## **Tomatoes: Help!**

**Q.** I hope your gardening season is going well. I would appreciate some tomato advice. I tried looking up the symptoms but have yet to figure out what is wrong.... I started the tomatoes in March and when I moved them to the greenhouse they began developing brown spots. Now, I thought I was being paranoid by pinching off all the leaves with the spot so I left them alone for two weeks. This week upon returning they are very light in color, even almost white in some spots with brown edges, so I'm not sure what's wrong. There are no signs of insects, so I've ruled them out.

Thank you for any advice you can provide. My next step will be to take them to the Penn State Pathology Lab to see what they say. Melissa

Tania and I had two thoughts: nutrient deficiency and cold conditions in your greenhouse.

1. Nutrient deficiency. First, what is your growing medium? Did you buy this or make it yourself? If the latter, out of what did you make it? If your own, have you ever had this tested? Second, the closest nutrient deficiency might be potassium. "A deficiency of potassium shows up as reduced growth, shortened internodes, marginal burn or scorch (brown leaf edges), necrotic (dead) spots in the leaf, reduced lateral growth, and tendency to wilt readily." You mentioned, and the pictures show, brown edges and spots on leaves (which leaves you pinched off).

2. Cold conditions. Tomatoes do not like conditions below 55 degrees! If you put these in your greenhouse, and the temps dipped below 55 degrees, you courted trouble. You will get purpling of leaves, and permanent reduced yield (if the plants survive). The other problem is edema. Edema means fluid retention (e.g., in lungs of humans). In plants, edema means too much water in tissue, which kills the cells and causes whitish leaf color. Edema develops primarily in cold conditions when the leaves do not transpire as much. Water builds up. Overwatering exacerbates this condition. The remedy is to cut back on watering. Now that the temps are warmer, this part of your problem might self-correct.

Unless you have ideal conditions, you court problems by starting, or putting, tomatoes in unheated greenhouses too early in the season!

## **Sulfur for blueberries?**

**Q.** Where does one find sawdust (blueberries like it?) to acidify a blueberry patch with too high a pH? Roberta

(Sigh) Growing blueberries in our high pH soils is a challenge. Here is a link to a good extension article on mulches, including sawdust. You cannot confidently acidify your blueberry patch with sawdust or anything else for that matter, as the mulch sits on top of the soil. In addition, if you mix it into the soil, it will rob your soil of nitrogen, which blueberries require.

<http://www.extension.uidaho.edu/nursery/Extension%20Publications/Using%20bark%20and%20Sawdust%20for%20Mulches,%20Soil%20Amendments%20and%20Potting%20Mixes%20-CIS%20858.pdf>

From this informative site on mulching ([http://grounds-mag.com/mag/grounds\\_maintenance\\_mulching\\_basics\\_covered/](http://grounds-mag.com/mag/grounds_maintenance_mulching_basics_covered/)) I quote the following:

*Conversely, hardwood bark mulch (even though it is initially acidic) may cause the surface soil to eventually become too alkaline (soil pH above 7.0), causing shallow-rooted, acid-loving plants to decline because of micronutrient deficiencies (the chief problem stemming from high pH levels).*

*Studies have shown that mulches do not significantly alter subsurface soil pH because of the buffering capacity of the soil. Therefore, concerns about pH are mostly relevant to surface-rooted plants.*

What is required is to have prepared your bed properly to start with. In our high pH soils this means adding lots of peat moss and sulfur. We use pastilles/granular sulfur rather than powdered, as the latter blows around and sticks to the soil, not mixing well. Sulfur does not move through the soil easily, so you cannot acidify a bed later by merely adding it to the top of your bed.

Annually thereafter, we mix peat moss into our compost before forking it into our blueberries. I would recommend this approach. In addition, we have determined from soil tests that our soils are deficient in magnesium. Therefore, add magnesium (Epsom salts good source) to your blueberry beds, either as a foliar spray four times/season, or by sprinkling Epsom salt granules on top of your bed. These are readily dissolved and will trickle down to the root ball. The calcium-magnesium balance important to humans is also important to plants, and goes some way toward compensating for the high pH soils in which you are attempting to grow blueberries. You can get Epsom salts at a drugstore in a box or bag. Foliar spray: mix 2 oz/gal until dissolved and spray both sides of the leaves. Do this 4 times/season. If sprinkle granules, try a half-cup sprinkled over the soil around each shrub out to a radius of 2' and water in. Do this annually in spring. Don't expect miracles.

Now, some further questions (which Roberta subsequently answered in blue):

- 1) Do you remember how you prepared your bed initially? [I prepared the blueberry beds using lots of peat mixed with some compost, and a little of the soil dug up.](#)
- 2) What are the symptoms of your blueberries causing concern? [The plants are yellowish, and don't produce much more than a handful of blueberries.](#)
- 3) How long have you had them? [I mixed several different types, six plants in all. All but one are three years old.](#)
- 4) How big are the shrubs? [About 1.5 feet.](#)

- 5) Are they in a bed or in grass growing up to their stems? They are in a garden plot with them at one end and raspberries at the other end. The bed is mulched with newspaper and straw.
- 6) Have you ever pruned them? No.
- 7) Are there black walnuts nearby? I have found some sprouts of black walnuts in my main garden, likely planted by squirrels. I have not found black walnut sprouts among the blueberries. Since your last email, I've dressed the ground around the plants with a layer of Epsom salts (about 1/3 cup) mixed with peat and a teeny bit of compost.

Roberta goes on to report:

I got a Timberleaf soil analysis this year, and they say the main garden is also basic at pH of 7.3. I don't need any nitrogen or phosphorus and the calcium is too high. They recommend using "sul-po-mag" and or some Epsom salts. Organic matter is pretty good. I guess with high calcium, I should not use any calcium amendments on the tomato plants this year. Anything else I can do? Roberta

BLUEBERRIES. Growing blueberries in high pH soil is difficult. It requires a heroic effort, and in the end may not work out. Judging from what you describe, your plants are off to a weak start.

In a healthy blueberry shrub, pruning out of old cane is necessary to encourage new cane to emerge from the root ball. One would begin doing this at the 5th year or so, saving the best three or so, and removing the rest. Yours are not mature enough to begin pruning, and may not be healthy enough as well. Pruning is done in late winter (March).

Blueberries are heavy nitrogen feeders. I wonder if you are using too much peat relative to the amount of compost. I amend our compost with peat, rather than what I understand you do -- amending your peat with compost. Next year, try a ratio of 1 part peat to 3 or 4 parts compost. For this year, get some fish emulsion and drench the soil around the shrubs as per directions. We use Alaska brand, which I have seen at Lowes, for example. Comes in a quart bottle, and is a concentrate. In another month, say, mid-July, do a second application of Epsom salts and fish emulsion. Don't fertilize in late summer or fall, or prune in fall, as these steps may encourage new growth which then gets killed by winter cold.

YOUR HIGH SOIL pH. In 1999 our soil pH was as yours, 7.3. On our vegetable beds, we've added sulfur over the years, and have brought it down to 7.1. We add ~ 8 oz/100 sq.ft. and work it in annually with the compost in the spring. We use the pellets (sometimes called pastilles), not the powder, as this latter blows around in the wind, and sticks to clay, so does not distribute well in the soil. We get it in 40 lb bags. If powder is all you can get, I would mix it carefully with your compost just before applying it to your beds. Don't breathe it in. On shrubs including blueberries, we use peat moss with our compost, not sulfur.

CALCIUM. There is never a reason to add calcium to tomatoes in high pH soils. Blossom end rot is caused by irregular watering, and this prevents proper calcium absorption. You would never add any kind of calcium to a high pH soil. That means no limestone of any kind. If you add your own compost made from leaves, you may find, as we did, that your soil pH climbs! This is because the trees and leaves absorb calcium. Many farmers have to lime their soils because these are acidic. High acid soils can also be caused by excessive or long-term use of synthetic fertilizers.

Keep us posted on your efforts and results.

### **Soil pH and compost pH**

**Q. What is the ideal pH for usable compost from the oldest of my three bins? Mine is at 7.4. Does that need to be amended? Does one amend a compost pile??**

#### 1. Advice on Compost

Compost made from material in high pH soils takes on and even concentrates the pH of the parent materials. Thus, compost made from, say, maple leaves, takes up the calcium in our limestone-rich soils. Oak leaves do likewise, contrary to a popular garden myth that oak leaves acidify soil or compost. Oak leaves in acidic soil, by contrast, are acidic.

At 7.4, you are too high. Most vegetables and fruit prefer soil at or below 7.

We now amend our vegetable beds with sulfur (pastilles or granules) every season to compensate for the high value of our soils and the higher value of our compost. We use 8 oz/100 sq.ft. broadcast with other minerals onto which we spread our compost, and then turn in. We buy sulfur in 40# bags and go through a lot. For smaller amounts, call around to local garden supply centers (College Gardens, Lowes, Walmart, etc.) and see if you can locate sulfur in small amounts. Remember, pastilles or granules are better than powder. If using powder, I would mix carefully into my compost just before applying it to my garden bed and turning in. If all you require is a pound or two, I can give you some from our bag.

Better not to add sulfur to your compost pile. Sulfur is an antibiotic, and kills microbes. You require microbes to break down your compost. We amend our fruit trees and shrubs with compost and peat moss (highly acidic), as trees and shrubs depend more than vegetables do on mycorrhizal relationships with the roots and sulfur is deleterious to fungi.

#### 2. Sulfur-shy plants.

Some plants are sensitive to sulfur (called "sulfur shy"). In our experience, these include crops that fix nitrogen such as beans and peas, and also broccoli and tomatillos. Symptoms appear after transplant of seedlings as the roots reach out to the sulfur-amended soil. These include sickly-looking plants, yellow blotching of leaves

reminiscent of viral infections, twisting of leaves. Beans at least outgrow it. The symptoms do not appear in subsequent years when we move those crops to other beds that had previously had sulfur applied. Therefore, we do not add sulfur to our beds in which we are growing those crops that season.

This year we are broadening our exclusion of sulfur to tomatoes, as we noticed odd symptoms on several varieties in recent years.

### **Downy mildew of basil**



**Q.** For the past few years we have had downy mildew on our basil. We've never had this before. What is going on?

The past three summers have been uncharacteristically wet. This provides congenial conditions for fungal infections, and downy mildew of basil has been widely reported in Pennsylvania as a result. It spreads quickly. From what I can gather, most organic treatments only delay the onset of downy mildew. The best defense is to harvest quickly and plant a second crop. The key is to keep the basil leaves dry. For more information on management, pursue the following link below:

<http://www.mofga.org/Publications/MaineOrganicFarmerGardener/Spring2014/BasilDownyMildew/tabid/2761/Default.aspx>

### **Fruit trees**

**Q.** I have a couple of old apple trees that bear little fruit. I also have a plum and a peach tree that are also compromised.

The two apple trees show curling and browning of the leaves with only a few apples on one tree (so far appearing to be healthy, but usually ending up scabby) and practically none on the other.

The peach tree has small undeveloped fruit with brown scabs. This tree is only about 6-7 years old and had produced well up to a couple of years ago.

The plum tree produced a lot of healthy fruit the first year but hasn't done much the last three years. It doesn't seem to have much fruit and appears to have a lot of fruit drop.

I would love to treat these trees (especially the peach and plum) organically if possible. It would be great if you could either look at them or scrutinize some photos I could send you.

Thanks for any ideas! Andy

I've been reflecting on your fruit tree challenges while waiting for your photos. Here are my thoughts on organic practices, general and specific, for fruit trees.

### GENERAL THOUGHTS

1. All fruit trees require annual pruning, up to twice a season in the spring and mid-summer, depending on the variety. Do you prune your fruit trees?
2. All fruit trees require a regular regimen of steps to control pests and diseases. Do you do anything in this regard?
3. All fruit trees require annual application of compost, an initial application of several minerals, and less frequent application of minerals as the tree grows, to build up and maintain fertility. Do you do this?
4. In addition, the roots quickly outgrow the original fruit hole. Unless your soil is good quality, we have found we had to expand the planting hole as the tree grew. We now grow our trees in beds, at least 5' wide. This has made a BIG difference, as fruit trees require well-drained soil which a mere initial hole in heavy clay does not provide. How good is your parent soil? Did you start with a hole or a bed? If a hole, did you expand it as the tree grew? What is now the surface condition around your trees? If grass? NOT GOOD!

### SPECIFIC THOUGHTS

Old apple trees. There is a 1-time rejuvenation procedure for old apple trees. You might give this a try.

Peach trees. Peach trees require much attention, starting with selecting the right variety for colder climates. Peaches require shaping in the first and next couple of years to form a proper open vase-like scaffold. Peaches require spring shape pruning (heavier) and mid-summer tip pruning. Peach blossom buds form only on new wood this summer for blossoming and fruiting next season. If you do not prune, you will get leggy branches and reduced production with time. Peaches are self-fertile.

Plum trees. Unless your plum is self-fertile, you will require two for cross-pollination. If this is any consolation, and despite all the care I have given our two Japanese plums for the past dozen years, we only got plums once in an early year. Otherwise, we have suffered from almost total early fruit drop. Plums blossoms are not particularly attractive to honey bees, so it is recommended that growers place trees close to each other so

that branches intermingle, allowing for wind pollination. This has not helped us. Acting on a tip I read, I grew out a wild American plum from seed to use as an additional pollinator and trained it as a shrub (they can get quite tall, and this is what I wanted to avoid). It produced blossoms for the first time last year, but the few fruits dropped. This year we had lots of blossoms and LOTS OF FRUIT! In addition, we are getting some fruit on the other Japanese plums! The next problem will be brown rot, the bane of stone fruit. This destroys plums and peaches, and must be guarded against with frequent monitoring, picking off of diseased fruit, and spraying.

In general, we have come to conclude that bush fruit is more productive and easier to care for than tree fruit, and that if one insists on tree fruit, stick with dwarfs and lavish care on them.

By the way, paw paws are turning out to be a winner. Ever have one? They are native American fruits, members of the custard apple family. Easy to grow. Fruit ripens in late September to early October. You will require two for cross pollination. Avoid wild ones, and stick with cultivars. I can show you these and our other fruit trees, and what we do to shape, prune, and care for our other fruit trees.

### **Watermelons, how to tell when ripe**

#### **Q. How do you tell when watermelons are ripe? Taj**

From Bargyla Rateaver, Organic Primer Update, I found the following:

1. Ripeness indicated when tendrils on either side of joint where stem is turn brown, two nearby tendrils die, and stem is brittle!
2. Where the melon touches the ground, the skin should be yellow.
3. If you rub your hand over the skin, you will feel it rough and slightly ridged.
4. "Snapping" of the fruit is less reliable, and if used, should be done first thing in the morning. You should get a dull sound. Alternative: If flicking makes a sound like hitting your forehead, it is still green. If flicking sounds like thumping your chest, it is ripe. If it sounds like thumping your stomach, it is overripe!
5. Cut with 2" of stem.
6. Remove remaining flowers, so plant can put energy into developing fruit.
7. Short shelf life of 2 weeks if refrigerated. Can be frozen in syrup, or slices dried!

#### **Other tips:**

1. If melon lacks flavor, soil may be deficient in boron. Use seaweed meal.

2. Prefers acidic soil.
3. Pinch back the main vine so side shoots form, as these set fruit earlier than main stem.

### **Chameleon plant**

**Q.** I planted chameleon plant as a ground cover in my front area, and now I can't get rid of it. Does it have any value? Faye

Your chameleon plant seems to be the medicinal one. From Stephen Harrod Buhner's "Herbal Antivirals" I found the following:

The fresh plant is much more antibacterial and antiviral (than dried), and is traditionally pounded to make juice for oral administration, on wounds, or as eyedrops. The remaining mashed plant can be used as a paste applied externally to wounds and bites, and the decoction can be used for an external wash. The Japanese use a tea taken regularly as a tonic.

Buhner says the strongest, best use is as a tincture made from fresh leaves in a 1:2 ratio (1 part by weight of leaves, 2 parts by weight using 190 proof grain alcohol). Thus, you would use 16 oz of leaves and 32 oz of alcohol, for example. Dose is 1/4 - 1/2 teaspoon taken up to 6x daily. Cooking the plant as in a decoction destroys much of the active properties. The Chinese make decoctions, but boil only very briefly.

Long list of uses. Inhibits viral replication, directly virucidal, prevents viral infection if taken prophylactically. A moderately broad-spectrum antiviral. Active against influenza virus A (B1N1 strains), SARS related coronavirus, dengue virus serotype 2, avian infectious bronchitis virus, enterovirus 71, herpes simplex virus 1 and 2, etc. Active against a long list of other bacterial microbes as well (list in his book), including infections in the urinary passages and kidneys, genital infections, bacterial diarrhea, various diseases of the eye. Plants and young shoots an important food source in native regions.

Fishy smell which can be disguised by taking it with a strong-tasting but pleasant liquid. A valuable plant! Thanks for your cuttings. I'll make you a batch of tincture using 190 proof grain alcohol.

### **A complimentary blog**

**Q.** I stumbled onto a Peter Buckland's blog in which he talks about his visit to Neo-Terra this past summer. He had some nice things to say:

<https://peterisintheforest.wordpress.com/2015/08/01/such-anxiety-clouds-our-decisions/>

## **More info on paw paws**



**Q.** After tasting a paw-paw during our visit, our family agreed this is a fruit worth growing. How can I learn more about this native American fruit tree? Rick

I successfully tracked down the expert in Pittsburgh, Andrew Moore, and another expert, Neal Peterson. The latter has a page on cultural advice at:

<http://www.petersonpawpaws.com/CulturalAdvice.php> . He also sells six varieties of trees he regards as excellent (for various reasons).

Moore has a new book on paw paws, published by Chelsea Green, at his site:  
<https://thepawpawbook.wordpress.com/>

## **Chopping in cover crop seed**

**Q.** I read your website information on cover crops, but couldn't figure out how to chop in the seed. What do I do? Daniel

After cleaning your beds, if you find your soil surface is hard, loosen the top layer a bit. We take our spading fork and use a twisting motion to break up the surface, then break up clods using a sideways swing with the fork, or with a garden rake. Chop in seed lightly with your garden rake, using short up and down strokes. You are simulating a farmer's drill. You don't want to bury the seed too deeply. Spritz lightly, best in late morning and late-afternoon to keep moist. Avoid overwatering. Spritzing in the evening may attract slugs, which will eat the newly emerging seedlings. If it rains, don't water.

Slug damage can be severe in a wet fall. We have found that if you go out on three successive nights, say, around 9-10 pm, you can make a serious dent in your slug population. Here are two procedures:

1. Hand-pick and drop them in a salt-water solution. If the salt solution is strong enough, they will "fizz" and die. Let sit overnight, dilute with water to avoid salt damage, and pour on a wild patch in your yard. Pour more water where you've disposed of the slugs.

2. In a spray bottle, make a 10% solution of ordinary household ammonia. Set nozzle to narrow stream. Use slugs as target practice. Spray a couple of times on each. They will drop to the ground and die. Avoids hand-picking. Ammonia is a nitrogen source, so will not harm your cover crops in this dilute solution.

### **Rotating cover crops**

**Q.** I know one is supposed to rotate cover crops but does that mean one can never follow a legume w/another legume? I am using vetch w/wheat or oats; or red clover w/a nurse crop; or a peas & oat mix. But that means I can only use legumes one year and not the next? And if that's true how long a rotation should one observe w/cover crops.

Thanks for being there. When I've done all the research I can and still can't find an answer it's good to know you're there. Andi

As to your questions about cover crops.

1. The rule not to follow a legume with a legume is to avoid diseases and pests, the same reason for avoiding following, say, tomatoes with tomatoes, or lettuce with lettuce. Thus, where I am going to plant our green beans, I would sow only rye the previous fall, not rye and vetch.
2. I alternate rye with wheat for late spring crops the following year, as both overwinter. Thus, in the fall of 2013 I used wheat with or without vetch. Last fall (2014) I used rye with or without vetch. This fall, I will switch back to wheat.
3. Oats are our main fall cover crop with or without vetch for early spring crops the following year such as lettuce, spinach, onions, collards, etc. You can also use sorghum-sudan grass, and buckwheat for late summer cover crops that winter kill.
4. After garden peas, I use Japanese millet, which stands summer heat very well, and provides lots of organic matter for our compost pile. I have also used buckwheat. Any excess nitrogen produced by the peas is taken up by the millet. Corn follows our peas the next year, and since the Japanese millet winter kills, we plant fava (bell) beans in the spring before the corn to give a boost of nitrogen and to loosen the soil.
5. You can alternate clovers with vetch/peas to extend your rotations. It sounds like you are doing that already. Berseem clover works in the late summer for fall growth, and winter kills. There are many clovers. Peaceful Valley Farm and Garden Supply has nice charts and descriptions to help you expand your choices. They are at [www.groworganic.com](http://www.groworganic.com) and click on the first menu item, Seeds, and go to Cover Crop. Once there, click on the "Solution Chart" on the right side of the page. It will make your head spin.

6. We cannot use peas as a cover crop as germination is poor, due to soil pathogens and saprophytes (the first cause rots, and the second feed on wet pea seeds).

7. Our main food crops come between cover crops, and in the event that vetch happens to be used two falls in a row, at least there is an intervening main crop. This happens here and there, and so far it has not caused problems as far as we can tell.

That help?

### **Skimming beds in cover crops**

**Q.** I've been skimming my beds which I have yet to really understand. I mean I get that you're looking for the sweet spot, but I'm not sure I know where it is. I found this very useful tool and wanted to share with you just in case you somehow didn't come across it. It's called a Hori or a Hori Hori – it's Japanese. I can use it to cut the area into squares w/the sharp end and then what I really like is on one side it's serrated and I can cut across between the soil and the plant – the skimming – and I believe this gets me closer to that sweet spot. Have you used this? With gratitude, Andi

Great hearing from you! Yes, the hori-hori is one of our favorite tools. I have three, and Tania two. We've used them for years. We have extras as we have lost them (e.g., in compost piles but recovered them later when we turned the piles).



I'm confused by your description of skimming. If you're cutting your squares with a hori-hori, you are doing too much work. We use a spading shovel (straight edge, not pointed), standing on a digging board on our bed, facing one end. We cut a line across the bed about 10-12" wide (somewhat longer than the length of our shovel blade). We then cut the row of sod into the squares, each a little wider than the shovel is wide.



We then get down on our knees (using knee pads) and insert the straight edge of our shovel into a square of sod, about 2" down, push, and cut the sod cleanly from the roots beneath. If you go too high, the resistance is higher. Too low, and you're taking up too much soil. The sweet spot is the place about 2" down or so where the horizontal slicing with your shovel seems easier.

For a given bed section, we may lift the squares into our

wheelbarrow and wheel to a pile where we store it to break down. It makes a great addition to our potting mix. When broken down, you can also use it to sprinkle on your compost pile to inoculate with microbes.

Alternatively, we leave the squares on the bed to decompose. Takes three weeks (although this year May was quite dry until the recent rains, and decomposition is taking longer). At the end of this period, we rake off the undecomposed material, usually minimal, and wheel it to our compost pile. The roots below the cut break down in the soil as well. Thus, you should skim a bed three weeks prior to planting.

Does this help? Have I misconstrued what you are doing?

### **Rotation scheme for main crops**

**Q.** This is likely a goofy question. When looking at the [Planting Scheme: Rotation chart](#), what is the order of planting? For example, do I first plant fava beans in fall, then follow with tomatoes, then bell beans, then corn? The "red down arrow and (follows) " has got my dyslexia running full throttle! Thanks :), Jeanne

Good questions!

1. The first column lists cover crops you might plant before you plant the main crop in column 2, so yes, plant bell beans (*vicia faba*) before crops of warm season heavy nitrogen feeders such as tomatoes and corn.

2. In temperate climates such as the northeast you would plant favas in the spring. Our target planting date is April 7. These mature in time for an early June planting of tomatoes and corn, and provide ready nitrogen. Use the proper inoculant for fava beans. In California and southern areas, you can plant favas in the fall prior to a late

winter planting of heavy feeders.

3. Get bell beans, which are a small seed, not the eating favas, which are expensive. Fedco does not include them in their current catalog, but Peaceful Valley sells these (Item SCL700 or SCL701 for organic at [www.groworganic.com](http://www.groworganic.com). The correct inoculant is ISE350, ISE505 (larger), or ISE500). Notice that these also inoculate other crops, so select the one that will inoculate other crops you are growing.

4. If you are a small-scale gardener, soaking the beans prior to planting helps speed germination. I soak 1-2 days, with 2 rinses/day. Seeds will plump up. Drain, sprinkle inoculate on them, and plant. By the way, you would use the same soaking and rinsing procedure for beans you would eat. This helps to get rid of antinutrients. We soak and rinse beans every 8 hrs prior to cooking. Thus, if we start in the morning, we soak and rinse three times and cook the next morning. Soaking also reduces cooking time by at least 50%. Adding a pinch of baking soda to the cooking water on first boil also helps speed cooking.

5. Other cover crop combinations are also useful for late-planted cover crops: fall wheat and vetch, or winter rye and vetch before tomatoes or corn. Both overwinter, come back in the spring, and grow luxuriantly. We get 2-3 cuttings off them which feed our compost pile. In biointensive, you would do the final cutting and skimming 3 weeks prior to your crop planting date to give time for the roots to break down and soften the soil. With fava, you can cut and plant on the same day. Thus, for corn, we cut, add compost and minerals, aerate/turn under, and plant our corn (seedlings in our case). With tomatoes, we chop the stalks into 3-4" pieces and turn under, as their degradation deters verticillium wilt. For fava, make sure when you are done that the fava roots are buried. These contain the nitrogen nodules, and exposure to air will convert these nodules to an oxide and the nitrogen will "disappear."

6. Now, on to order and the red arrow. Imagine a game of musical chairs. Keep your eye on, say, the first three chairs moving from left to right. In 2015 you have planted tomatoes on chair 1, corn on chair 2 and beans on chair 3. In 2016 you will plant tomatoes on chair 2, corn on chair 3, etc. Thus, Tomatoes FOLLOWS the spot where corn WAS. Corn FOLLOWS the spot where beans WERE. The red arrow column is a fine tuning, one of the schemes we derived from Eliot Coleman. Other schemes are possible. He claims better yields. I go with the experience of growers such as Coleman.

Tania and I wore ourselves dizzy as new growers trying to figure out rotation and cover crops. Now it is second nature. Keep at it. You will get it.

### **Fighting cucumber beetles**

**Q.** When you visited our gardens, you mentioned a procedure to keep cucumber beetles off of our vines. Could you summarize this for me? Thanks, Dana

At a PASA presentation a few years ago Penn State and Michigan State organic

extension faculty revealed that cucumber wilt is transmitted through the flower petals into the plant by the cucumber beetle's feces! Thus, it is important to cover your plants with a row cover when the first blossom opens, and to keep the plants covered for 10 days. Then you remove the cover to allow pollination. Eventually, you will lose the plants to the beetle, but by that time you would have had good fruit set.

We have used this procedure successfully for the past three years to great success, growing ~ 150 cukes this year from 10 plants, more than enough for putting up 20 qts of lactic fermented pickles, cucumber smoothies, and salads.



We use a vertical trellis and a cage made of tulle hung in place with four metal poles (emt -- electrical metal tubing from Lowe's). We put old socks on top of the poles to prevent tearing of the fabric, and use duct tape on the top of the wooden frame to prevent snagging of the tulle cloth by wood splinters. The tendrils of the plants grab onto the tulle, and that requires monitoring to move the tendrils to the trellis. We also insert bamboo poles midway along the long sides to help keep the tulle away from the vines.



For the trellis, we used 2 x 2's to make a frame, to which we fastened steel mesh (also from Lowe's). We screwed the frame to two green metal garden stakes in the manner shown, so that the stake flange prevents leaning.

I suppose if you let your cukes sprawl on your growing bed, you could use an ordinary row cover laid over the top of the plants.

### 3-bin composter

**Q.** I enjoyed your informative presentation on composting tonight and would like to have the additional information you mentioned emailing to interested participants. Lori

Great having you join us last night. Here's the information you wanted:

1. Garden metrics page: on page 20 of our Organic Gardening Primer: [http://www.neoterra.org/uploads/2/5/6/4/25644359/og\\_primer\\_website\\_2013.pdf](http://www.neoterra.org/uploads/2/5/6/4/25644359/og_primer_website_2013.pdf)
2. Details for making compost, refer to pages 16 through 19 of our OG Primer above
3. Instructions for making 3 bin composter are at: [http://www.neoterra.org/uploads/2/5/6/4/25644359/q&a-6\\_garden\\_devices.pdf](http://www.neoterra.org/uploads/2/5/6/4/25644359/q&a-6_garden_devices.pdf)
4. Picture of finished 3 bin composter that you looked at during workshop:



If I missed something, let me know. Of course, if you have questions, please contact me to clarify.

Gene

### The 60-30-10 rule

**Q.** I came across the 60-30-10 rule while reading Jeavons. What is this and do you achieve this? Daniel

The 60-30-10 rule (from Jeavons) pertains to self-sufficiency in organic matter for your soil. The 60% refers to cover crop ratio -- the time your beds are in high carbon-producing cover crops to produce organic matter for the soil. This is achieved by growing high carbon crops such as cover crops (oats, rye, wheat) which also produce grains if grown to maturity, or food crops such as corn which produce a lot of organic matter (or flour if you grow corn for flour). As we have many deciduous trees in our yard, we're able to produce more than enough organic matter for our garden, allowing us to build soil with a cover crop ratio of 40%, which we achieve consistently. Our soil organic

matter is higher than the 6% recommended, as you may recall from the soil test results we showed you.

Now to the other two percentages -- the 30% and the 10% figures. The 30% figure refers to root crops. These produce a considerable amount of calories. For us, this means beets, carrots, sweet potatoes, onions, garlic, burdock and horseradish. Other high-caloric root crops include leeks and salsify. These come to 23% of our growing area. The 10% figure refers to vegetables. For us, the balance, or 37% are in vegetables, but also herbs, both culinary and medicinal.

Grains, for us, yield poorly in our somewhat shady garden. We tried wheat one year, and got a little more than a cup of wheat berries per 100 sq.ft. We also tried quinoa another year, but harvesting the tiny seeds was beyond us. The caloric yield of root crops is much higher than grains according to Jeavons, and we have confirmed this in our own practice. Were we interested in growing more calories, we would plant more sweet potatoes, beans for drying, and burdock.

In addition to vegetable beds, we also have perennial beds with fruit bearing trees and shrubs, which supply additional calories, valuable phytonutrients, and diversify our diet. We have peach, apple, plum, cherry and paw paw trees. Among the berries are strawberries, blueberries, bush cherries, currants, gooseberries, juneberries and raspberries. Black raspberries, gooseberries and currants are easy to grow and prolific in our yard. Our peaches produce well, too, but plums and apples less so. Blueberries are a challenge in our high pH soils, and strawberries are affected by adjacent black walnuts (as our blueberries, by the way).

We started with one bed in 1997. Start small, get the principle down, then expand. We have an example garden layout incorporating organic and biointensive principles starting on page 32 of our Organic Garden Primer. Have you looked at this? We also have a section of growing tomatoes starting on page 42.

## **Weeds**

**Q.** [I have a serious weed problem. Jeavons claims his practices help reduce this problem. What practices do you follow? Daniel](#)

Here are the strategies we follow to reduce our in-bed weeding to practically nothing:

1. **COVER CROPS.** Once you start using cover crops, and skimming your beds, you will notice a reduction in weeds. Cover crops shade out weeds, though it is important to check your cover crops from time to time, fall and spring, for the vicious ones that to seed early, e.g., PA bittercress, a member of the mustard family.
2. **CLOSE SPACE PLANTING.** Now that you are converting to beds, consider planting in offset rows (also triangular planting or honeycomb). You cover the entire section with plants, and these provide a living mulch, which shades out weeds. In addition, if you

follow Jeavons' planting distances, you can maximize your yields for your crops.

3. **MULCH.** Small, closely spaced plants, do not require a mulch (with a few exceptions, such as onions). Carrots, beets, turnips, lettuce shade out the soil pretty quickly, and create their own living mulch. Other plants benefit from a mulch to retain moisture, prevent fungal spores from splashing up from soil to plant, and reduce weed pressure. We use different kinds of mulch for different crops. On tomatoes and corn, we use chopped perennial stalks we stockpile from fall or spring cleanup. We also save some of the last cutting of our cover crop from rye, oats and barley. We dry it out and bag it for later use or use it directly on our beds. On other crops (e.g., our bins of burdock) we use chipped wood from the township wood chip pile. It is free. For our strawberries, we get a bale of hay from a local farmer. So far, it's been pretty clean.

We limit depth of mulches. Too much prevents rain from getting to the crop, especially the denser mulches such as wood chips. Limit this to 1-2". Wood chips break down under the influence of fungi, and form fungal mats which actually prevent rain or water from penetrating. We never use grass. This is hot, and can easily mat down and act as a barrier to water. Leave on your grass if not too heavy or mix into your compost pile.

4. **SCOUT FOR WEEDS.** Learn which weeds are invasive in your garden, and root these out before they reproduce. If you go with grass paths, check for weeds there, too. The weeds we scout for are dandelion, PA bittercress, speedwell, and purslane.

If you follow these practices, you may arrive at the point we have: (almost) zero in bed weeding.

### **Growing blueberries, currants, gooseberries, raspberries**

**Q.** A friend gifted me gooseberries and currants. In addition, when you were over visiting our garden you mentioned we should be pruning our blueberries and red raspberries. Do you have any good sources you can recommend for taking care of these fruit shrubs? Best to you and Tania, Chris

1. For gooseberries and currants see:

<http://extension.psu.edu/plants/gardening/fphg/gooseberries-currants> . For pruning, treat gooseberries and red/white currants similarly. On black currants, I elaborate further on their notes under "pruning." Fruiting occurs on 1 year old wood from new shoots grown from the ground the previous year, or 1 year old wood on older cane which grew out from buds on the previous year's wood. You don't want to continue using old cane bases for new cane production past two or three years, as it reduces yield, and inhibits new cane formation from the ground. Lee Reich has great information on growing gooseberries, red and white/pink currants, and black currants in his book "Uncommon Fruits for Every Garden." I am attaching a pdf of his section on red and white/pink currants.

2. For Blueberries see the following. On planting and pruning, with nice videos, see <http://umaine.edu/publications/2253e/> Of course, substitute compost/organic fertilizers for their chemical fertilizers. Penn State Extension has a further note at:

[http://extension.psu.edu/plants/vegetable-fruit/news/2014/blueberries-2013-popular-but-vexing?utm\\_campaign=Vegetable+and+Small+Fruit+Gazette&utm\\_medium=email&utm\\_source=newsletter&utm\\_content=newsletter\\_more](http://extension.psu.edu/plants/vegetable-fruit/news/2014/blueberries-2013-popular-but-vexing?utm_campaign=Vegetable+and+Small+Fruit+Gazette&utm_medium=email&utm_source=newsletter&utm_content=newsletter_more) ;

Phomopsis blight can be serious, as it can destroy twigs. I notice this particularly on new growth emanating from the ground, which is the future of the shrub! Check out:

>><http://ohioli.osu.edu/hyg-fact/3000/pdf/3214.pdf> . I use liquid sulfur in the fall and spring. Of course, prune out diseased twigs.



>><http://www.fruit.cornell.edu/berry/ipm/ipmpdfs/BB%20canker%20fast%20fact.pdf>

3. Red Raspberries. On pruning --

>> <http://www.gardeningknowhow.com/edible/fruits/raspberry/pruning-raspberry-bushes.htm>

Give these references a try, and ask me any questions you have.