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## SHORTS:

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### IN THIS ISSUE:

#### SHORTS

#### STRAWBERRY

- ❖ Winter Mulch for Strawberries
- ❖ Cultural Practices for Disease Control in Organic Strawberry Production Systems

#### RASPBERRIES/BLACKBERRIES

- ❖ Disease Snapshot - Phytophthora Root Rot of Raspberry
- ❖ New Cornell Raspberry Variety Extends Harvest into November

#### BLUEBERRIES

- ❖ Spring Planting Plans

#### GRAPES

- ❖ Post-Harvest Checklist for Vineyards

#### GENERAL INFORMATION

- ❖ How Healthy is Your Soil? Cornell Soil Health Testing Program Can Tell You

#### UPCOMING MEETINGS

### NRCS publishes handbook to help you understand several conservation programs

Massachusetts farmers and forest land owners considering looking for financial and technical help from NRCS now have a resource to help them understand what's involved in applying for and participating in several federal conservation programs. "Understanding the 2008 Farm Bill Conservation Programs" is an eight-page handbook that walks landowners through the entire process from conservation planning to submitting an application to signing the contract, and beyond. Read more at:

[http://www.ma.nrcs.usda.gov/news/connection/2011-10-26/program-applicant-participant\\_handbook.html](http://www.ma.nrcs.usda.gov/news/connection/2011-10-26/program-applicant-participant_handbook.html)

### Scaling Up Local Food: Investing in Farm and Food Systems Infrastructure for the Pioneer Valley

- CISA's new report, *Scaling Up Local Food: Investing in Farm & Food Infrastructure for the Pioneer Valley*, provides real-life, local examples of the successes, challenges and opportunities in the Pioneer Valley food system today. Consumers, farmers, businesspeople, investors, planners, and policy-makers will find suggestions for action to help create a local food system that provides more local food to more residents of our region.

### UMass Vegetable Research Videos

What do heritage wheats, the ecology of the cucumber, Brazilian vegetables, heirloom tomatoes and nutrient rich cabbages have in common? They are all part of the research going on at UMass Amherst's research farm alongside the Connecticut River in South Deerfield. Get an inside view of the research from these videos.

- [Growing Nutrient Rich Tomatoes & Cabbages](#)
- [Heritage Wheat Grown in Massachusetts](#)
- [Multi Species Interactions in Cucumbers](#)
- [Ethnic Crop Research at UMass Amherst](#)

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## STRAWBERRY

### Winter Mulch for Strawberries

*Sonia Schloemann, UMass Extension*

An important fall job in commercial strawberry production is mulching. Strawberries are commonly grown in cold climates, such as the northern US and Canada, but the strawberry plant itself is actually quite vulnerable to cold injury. Research has shown that, without mulch, strawberry crowns can suffer damage at temperatures below 12°F and unprotected strawberry plants can suffer desiccation damage from drying winter winds. A protective mulch can protect strawberries from cold by providing insulation, and from desiccation by providing a barrier against drying winds. Mulches will also protect plants from injury caused by soil heaving, which results from freezing/ thawing cycles during the winter. So, a key to consistent quality strawberry production in cold climates is in protecting the plants from severe temperatures or temperature swings through the practice of mulching.



Production systems can also affect the need for mulching. Plants on raised beds, for example, are more vulnerable to cold and desiccation injury than plants in level plantings, especially in locations that are exposed to strong winter winds. Annual production systems, such as fall planted plasticulture, may utilize less hardy or disease susceptible cultivars. As we will see, mulching practices must adapt to these new systems.

**When should the strawberry grower plan to apply mulch?** Research suggests that a good timing guide is to apply mulch after three consecutive days with a soil temperature of 40°F or below. This soil temperature usually occurs after multiple frosts, and when the plants have slowed growth in response to cooler temperatures. It is best to apply mulch before the soil freezes solid. In New England mulches are applied in late November.

**What is a good mulch material?** The traditional mulching material for strawberries in New England is straw. Straws

from wheat, rice, oats, or Sudan grass work well. Straws coarser than Sudan grass are not recommended. Straw should be clean, free from weed seed, and contains a minimum of grain seed. Strawberry growers can produce their own straw, often cutting the straw before the grain seed is viable. Store straw for mulching in a dry area. Occasionally, grain seedlings can become a weed problem the following spring; an application of sethoxydim will give good control.



**How much mulch should be applied?** A traditional, level matted row planting will require 2.5 to 3 tons of straw per acre for a 2 to 3 inch deep mulch, or about 300 small bales of average weight. Raised bed plantings and sites with strong wind may require twice this amount for adequate coverage.

**How is the mulch applied?** Smaller plantings may be mulched by hand by shaking out the bales of straw over the row. Larger plantings often use bale choppers to break up the straw bales and distribute the straw over the bed. Choppers are available for both small bales and large round bales.

**How and when is the mulch removed?** In the spring, when plants begin to show growth under the winter mulch (new green tissue), the mulch should be raked off the rows to allow sunlight to penetrate and reach the foliage. Delaying removal will delay plant growth and flowering and may reduce yield. Mulch can be raked off by hand with ordinary



yard rakes in smaller plantings. In larger plantings, various mechanical tools are available ranging from modified hay rakes and tedders to equipment specifically designed for the purpose.



**Floating row covers as mulch.** These covers are composed of a plastic such as polypropylene, spun-bonded into a fabric that is permeable to light, air, and water. Research and growers' experiences demonstrate that these covers are useful for winter protection of strawberry plantings. While floating row covers are available in several weights, only the heavier

weights are recommended for winter protection. At present a widely available weight recommended for winter strawberry protection is 1.25 oz/yd<sup>2</sup> (42 g/m<sup>2</sup>). A variety of fabric widths are available, with common widths ranging from 15 feet to 60 feet. This material currently costs about 4 cents per square foot. With proper care, this heavier fabric should last 3-4 seasons. Floating row covers are widely used to protect annual plasticulture plantings.

Row covers are best applied on still days. Be sure to line up sufficient labor to place the row cover. If possible, use wider widths for more efficient application. The row cover edges must be anchored, as must areas where two covers overlap. A variety of methods are used to anchor the edges. Edges may be anchored with posts, rocks, or tube sand. The edges may also be covered with soil.

Once the mulch is in place, the job is not done for the winter. Monitor the planting frequently. If straw has blown off areas, replace at once. Watch the edges of row covers, and adjust anchors if needed. Repair any rips or holes as soon as possible.

*Any reference to equipment or product brand names does not constitute endorsement over like products or equipment.*

## **Cultural Practices for Disease Control in Organic Strawberry Production Systems**

*Mike Ellis and Mizuho Nita, Ohio State University*

The use of any practice that provides an environment within the planting that is less conducive to disease development and spread should be used. The following practices should be carefully considered and implemented in the disease management program.

### **Use Disease-Free Planting Stock**

Always start the planting with healthy, virus-indexed plants obtained from a reputable nursery. Remember that disease-free plants are not necessarily disease resistant: cultivar selection determines disease resistance.

### **Site Selection**

**Soil Drainage (Extremely Important)**-Select a planting site with good water drainage. Avoid low, poorly-drained wet areas. Good water drainage (both surface and internal drainage) is especially important for control of Leather Rot and Red Stele. Both of these diseases require free water (saturated soil) in order to develop. If there are low areas in the field that have a tendency to remain wet, this is the first place that red stele will develop. Under Midwestern growing conditions, any time there is standing water in the field; plants are subject to leather rot infection.

Any site in which water tends to remain standing is, at best, only marginally suited for strawberry production and should be avoided. Any practice, such as tiling, ditching, or planting on ridges or raised beds, that aids in removing

excessive water from the root zone will be beneficial to the disease management program.

### **Previous Cropping History**

Select a site that does not have a history of Verticillium wilt in any crop. Select a site that does not have a history of red stele or black root rot. To minimize the risk of black root rot, do not replant strawberries immediately after removing an old strawberry planting. In general, it is also not a good practice (due primarily to Verticillium) to plant strawberries immediately after solanaceous or other Verticillium-susceptible crops. These include tomatoes, potatoes, peppers, eggplant, melons, okra, mint, brambles, chrysanthemums, roses, or related crops. If possible, select sites that have not been planted to any of these crops for at least 3 to 5 years. There should be no herbicide residual in the soil from previous crops.

### **Site Exposure**

A site with good air circulation that is fully exposed to direct sunlight should be selected. Avoid shaded areas. Good air movement and sunlight exposure are important to aid in drying fruit and foliage after a rain or irrigation. Any practice that promotes faster drying of fruit or foliage will aid in the control of many different diseases.

### **Crop Rotation**

**First Planting of Strawberry** - If the land has no recent (5 years or less) history of strawberry production or

Verticillium diseases in other crops, soil-borne diseases such as red stele or Verticillium wilt should not be a problem.

**Replanting Strawberries - Crop Rotation and Soil Fumigation.** If strawberries are to be replanted in the same field, crop rotation must be used or the field should be fumigated. Fumigation is currently not an option in organic production systems. With rotation, the site should be plowed, worked down and planted to a crop that is not susceptible to Verticillium wilt for a minimum of 2 years. Many soil-borne pathogens form specialized survival structures and are capable of surviving for several years in soil, even when strawberries are not present. The longer the site can be rotated away from strawberries prior to replanting, the better.

The combination of crop rotation plus soil fumigation is a sound approach that is used by many conventional growers. However, for organic growers (that cannot use soil fumigation), crop rotation alone often provides acceptable control for most soil-borne diseases, if the rotation is sufficiently long.

Neither crop rotation nor soil fumigation will reliably provide adequate control of red stele. With red stele, disease-resistant varieties and improved soil drainage must be emphasized. Cultivars with resistance to red stele and Verticillium wilt should always be used.

#### **Fertility**

Fertility should be based on soil and foliar analysis. Soil should be analyzed and nutrient levels adjusted

before planting. The use of excess fertilizer, especially nitrogen, should be avoided. Sufficient fertility is essential to produce a crop, but excess nitrogen results in dense foliage that increases drying time in the planting (stays wet longer) and also results in softer berries that are more susceptible to fruit rots. Avoid the application of nitrogen in the spring prior to harvest on medium to heavy soils. Excessive use of nitrogen has been shown to increase the level of Botrytis fruit rot (gray mold).

#### **Weed Control**

Good weed control is essential to successful strawberry production. From the disease control standpoint, weeds in the planting prevent air circulation and result in fruit and foliage staying wet for longer periods. Gray mold, in particular, is a much more serious problem in plantings with poor weed control versus plantings with good weed control. In addition, weeds will reduce production through direct competition for light, nutrients, and moisture with strawberry plants and will make the planting less attractive to pick-your-own customers, especially if you have thistles!

#### **Mulch**

Research and grower experience has shown that a good layer of straw mulch is very beneficial for controlling fruit rots, especially leather rot. Bare soil between the rows should be avoided and a good layer of straw mulch is highly recommended. The mulch keeps berries from contacting the soil where the leather rot fungus overwinters. In addition, it also aids in preventing infested soil from splashing onto the berries. Recent research has shown that plastic mulch (a layer of plastic) under the plants and/or between the rows increases splash dispersal of the pathogens that cause anthracnose and leather rot. Especially where fruit rots have been a problem, the use of plastic mulch is not recommended.

#### **Sanitation**

Any practice that removes old leaves and other plant debris from the planting is beneficial in reducing the amount of Botrytis inoculum. Leaf removal at renovation is highly recommended.

#### **Irrigation Practices**

The application of supplemental water should be timed so that the foliage and fruit will dry as rapidly as possible. For example, irrigating early in the day is better than in the evening. If diseases, such as gray mold, leather rot, anthracnose or bacterial blight, become established in the planting, overhead irrigation should be minimized or avoided.

#### **Control Movement of People and Machinery**

Movement of people (pickers) and machinery from a field or area that is infested to a clean or uninfested field should be avoided. Diseases of primary concern are anthracnose, leather rot and angular leaf spot (bacterial blight). Diseases such as these are usually spread over relatively short distances by splash dispersal (rain or irrigation). Movement from one field to another field through the air (windblown spores) is generally not a problem with these diseases. However, pickers moving from a field where the disease is present to a non-infested field can transport fungal spores or bacteria very efficiently on shoes, hands, and clothing. If people or machinery are used in fields where these diseases are a problem, they should complete work in non-infested fields before moving to infested fields. In addition, any machinery that moves soil from one field to another can introduce soil-borne diseases, such as red stele, Verticillium wilt, leather rot, and nematodes, from infested into non-infested fields.

#### **Harvesting Procedures**

a) Pick fruit frequently and early in the day before the heat of the afternoon (preferably as soon as plants are dry). Picking berries as soon as they are ripe is critical. Overripe berries will cause nothing but problems during and after harvest.

b) Handle berries with care during harvest to avoid bruising. Bruised and damaged berries are extremely susceptible to rot.

c) Train pickers to recognize and avoid berries that have disease symptoms of gray mold and leather rot. If at all possible, have pickers put these berries in a separate container and remove them from the field.

#### Post-Harvest Handling

a) Always handle fruit with care during movement from the field to market to avoid any form of damage.

b) Get the berries out of the sun as soon as possible.

c) Refrigerate berries immediately to 35 to 40°F in order to slow the development of gray mold (*Botrytis*) and other fruit rots.

d) Market the berries as fast as possible. Encourage your customers to handle, refrigerate, and consume or process the fruit immediately. Remember that even under the best conditions, strawberries are very perishable. (*Source: New York Berry News, Vol. 10, no. 9, Nov. 2011*)

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## RASPBERRIES/BLACKBERRIES

### Disease Snapshot – Phytophthora Root Rot of Raspberry

*Kerik Cox, Cornell University*

**Disease Name:** Phytophthora root rot of raspberry

**Cause:** *Phytophthora spp.*

**When to watch for it:** Spring to fall

**First line of defense:** Site preparation to avoid standing water and promote soil drainage.

**Summary:** Phytophthora

root rot decline in raspberries will begin in the spring as the soil warms and plants begin to put out new growth. Unlike winter injury, which primarily affects the floricanes, both the floricanes and primocanes of plants infected with *Phytophthora* will become stunted, wilted, and chlorotic due to impaired root function. Below ground, *Phytophthora* will have destroyed many of the fine/ feeder roots, and will eventually colonize the larger primary

roots and crown. If one excavates a dying plant and scrapes away the epidermis from the crown and primary roots, they may find that infected roots are a deep chocolate brown, and uninfected roots are healthy and white. Once the infection has progressed to the point where the plant has died, other saprobic fungi will rapidly colonize the dead tissues, confounding diagnosis. *Phytophthora* is an aquatic organism, and the best means of managing it are avoiding planting in low-lying fields, selecting well-drained sites, and planting on raised beds. Pesticides such as mefenoxam and phosphorous acid-based products can help manage the disease when used in conjunction with the aforementioned cultural practices. (*Source: New York Berry News, Vol. 10, no. 9, Nov. 2011*)



## New Cornell Raspberry Variety Extends Harvest into November

Amanda Garris, Cornell News Service

Cornell's new raspberry variety, Crimson Giant, is fashionably late. Developed by Cornell berry breeder and associate professor of horticulture Courtney Weber, Crimson Giant was bred specifically for the New York climate and can extend the harvest window for fresh, local raspberries to the beginning of November.



"Consumer disbelief is the real challenge for Crimson Giant," said Weber, who works at Cornell's New York State Agricultural Experiment Station in Geneva, N.Y. "They are not accustomed to seeing locally produced raspberries that late in the fall, and they might assume the seller has put a 'local foods' sticker on berries from California."

The berry has all the attributes of high-quality commercial fruit: true raspberry flavor and firm, bright red berries that don't darken quickly in storage. The fruit is large, averaging 4.5 grams in its New York trial, a significant increase over the 2-3 gram berries in other varieties.



In local trials, Crimson Giant begins ripening in late September or early October, three weeks later than the widely grown Cornell variety Heritage. Weber reports that during the traditional fall raspberry harvest, Crimson Giant is still flowering.

The late harvest requires a protected production system such as high tunnels to shield the flowers and fruit from fall frost. Already widely used for summer tomato production in New York state, high tunnels are structures composed of hoops of metal or plastic covered by plastic sheeting. Unlike greenhouses, they do not have a foundation and are generally not heated. Drip irrigation supplies the necessary moisture to support plant growth. (Source: *New York Berry News*, Vol. 10, no. 9, Nov. 2011)

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## BLUEBERRY

### Spring Planting Plans

Gary Pavlis, Rutgers University Extension

Some growers may be considering a new blueberry planting next spring. It is imperative that some preparation occur beforehand so that disasters do not occur down the road. This year I visited a farm with 4 year old 'Duke' plants whose berries were not yet ripe. The berry load was very large but the berries were starting to dry up and there were very few leaves on the plants. As any reader of this newsletter knows, having no leaves is usually due to a root problem. When I dug a plant up I saw that the roots system went down 6-8 inches and then stopped. The plant could be literally peeled off the soil at a depth of 8 inches. Further investigation revealed that the soil changed color at 8 inches to a bright orange, contained clay and was impervious to blueberry roots. So what we have here is a planting of 'Duke' that was 4

years old, with a root system that will never grow any deeper than 8 inches because of the clay hard pan. These plants were trying to ripen a crop with a tiny root system and as a result, could not uptake enough water and nutrients to push leaves and ripen a load of fruit. The grower options are not very appealing:

1. pull up all the plants and sub-soil to a depth of at least 2 feet and replant,
2. sub-soil a new row between the old ones and move all the plants,
3. remove the trickle system and apply 6 inches of mulch to the plant row and return the trickle system to the top of the mulch hoping that the root system will grow up into the mulch.

All three require a lot of work. The alternative is a dead block of 'Duke'. This situation once again reminded me of the importance of site preparation before planting. Doing a soil boring before planting would have revealed the hard pan and the need for sub-soiling, something which is a lot easier to do before the plants are in the ground.

There are some critical things to take care of before planting. Checking pH and adjusting it to 4.5 to 4.8, doing a soil boring and checking for hard pans and the seasonal high water table, and eliminating perennial weeds are at the top of the list. In the end, a little work early can eliminate a lot of headaches later. (*Source: Blueberry Bulletin, Vol. 25, No. 23, September 2009*)

## GRAPE

### Post-Harvest Checklist for Vineyards

*Jodi Creasap Gee, Cornell University*

It's safe to say at this point that we've reached the end of the growing season. What has not been picked by now will likely not be picked at all - unless, of course, late harvest and ice wines are in the future for some growers and wine makers. Congratulations for making it through the season! Now is the time to think about post-harvest chores. Clean up and storage and all the fun tasks that come with winterizing vineyard equipment.

#### Post-Harvest Checklist:

For those of you who also receive the wine grape production newsletter from Penn State University's State-wide Wine Grape Educator, Mark Chien, this is a slight repeat. However, this certainly bears repeating after such a hectic growing season and long harvest. With a few modifications for our region, including juice grapes, here's a checklist for post-harvest activities:

1. Collect all bins that may be distributed far and wide. Clean and store them properly, under cover if needed.
2. Take the nets off the vines and store bird control devices and other items that are in the vineyard during the growing season for the winter.
3. Collect your weight tickets or whatever you use to calculate your charges to your customers. Send itemized invoices out to the wineries with payment terms. Check and double-check your contracts and numbers. If there are issues related to the contract, you can either take that up with the winery or processor now or a little later.
4. You have probably noticed vines with red leaves or white varieties with leaf curl. These may or may not be candidates for virus - be sure to check the trunk for damage or crown gall. If the trunk is clean, tag and test the vine for the presence of virus(es). They should be pulled if they test positive for virus, or you should plan to renew trunks if tumors or injuries are present.
5. If you have new vineyards that are clean tilled, it is too late to get a winter cover planted, but plan to get some grass on the soil for next year to prevent erosion. Prep the ground properly with a disc and harrow (no rototillers, please), then rent or borrow Chautauqua County's no-till drill or use an inexpensive seed spreader and roll the seed into the ground. The standard types of grasses used are rye, barley or oats. These are not permanent covers and,

when taken down, they will enhance the fertility of your soils. Remember, the higher the organic matter in your soil, the less nitrogen you need to apply pre-bloom. You can plant a permanent cover of durable slow and low growers like creeping red fescue, especially if vine vigor is a chronic problem. It will likely be expensive.

6. If you had weed problems this year, you might want to try a fall application of Roundup after the leaves drop from the vines. Remember, use of several 2, 4-D formulations is illegal in the Western New York Grape growing counties, so double-check formulations and regulations prior to applications to eliminate broad-leaf weeds.

7. Be sure to record trouble spots in each block, be it a downy mildew, powdery mildew, or phomopsis problem from this year. Losing leaves to disease only skews the leaf-to-fruit ratio, thereby making ripening more difficult in these "high yield and minimum standards" times. Being on top of sprays right out of the gate next spring will keep the vines cleaner and healthier and more productive. A healthy vine can be a productive vine.

8. For grafted plants, hybrid or vinifera, and younger vines (<5 years old), you will need to hill up vineyard soil with a grape hoe or grape hoe-like device to insulate the graft unions. Recall that the graft union is essentially a weak spot - like scar tissue - that is more sensitive to cold temperatures. Sure, we had a fairly mild winter last year, but that doesn't mean Mother Nature won't surprise us this winter. Hill up 5" to 6" of dirt over the union. Other options include straw and mulch. The lighter the material, the more volume you need to protect the vine. Hilling up can be tricky, and this is where laser-planted vineyards can be very nice - the straight rows allow for relatively easy hilling up and taking down of soil. Ask someone who's experienced in hilling up, if need be, and remember that weed management needs to be spot-on, and soil conditions should be just right (not too wet or dry).

9. How much is your equipment worth to you? Vineyard equipment is expensive and essential, so take good care of it. Clean, winterize, oil, grease, and properly store vineyard equipment that is not to be used again until spring.

10. We had a few rough times during this season - what,

with the hail storms and all. Tour (walking is best, but a Gator will do) around your vineyards to assess trouble spots - damaged posts, vines that need to be replaced, ruts between rows, etc. If vines need replaced, record what and where and order plants now. Grafted vines should be planned for 2 years in advance, so plan to plant those in 2010.

11. Many growers are already pruning, are you? Is your equipment ready, and do you know who will be pruning and what their skill level is? Pruning sets the tone for quality in 2009; recall we hit the high yield trifecta this year - more buds left, more water, and little to no crop thinning was done. While this led to high yields, many vineyards struggled to reach minimum levels of soluble sugars, which may or may not pay off.

12. If you can, talk to winemakers to request samples of your wines, especially the lots that are not yet blended. We had several winemakers and vineyard managers experimenting with vineyard treatments this year, so this is a prime opportunity to demonstrate how what you do in the vineyard affects what happens in the winery. Talk to the winemaker who buys your fruit and discuss the season, the fruit quality, and assess if anything needs to be done differently next year. Wine grapes bring more money because more work is required to make high quality fruit for fine wines. Your grapes represent this region - you certainly would prefer a positive perception of good quality fruit and wine, right? It's kitschy, but true: Quality starts in the vineyard, and it is essential to forge a relationship with the winemaker to whom you are selling fruit.

13. When you have the time, sit down and review the season carefully. This season started out warm and sunny and finished wet and cool. Figure out what worked and what didn't, and remember that if you were trying something new in your blocks, it usually takes almost 3 full seasons to see a statistically significant difference in treatments. Again, record trouble spots (disease, insects, frost pockets, etc.) and plan to manage your blocks accordingly for next year. Vine balance seemed to be a problem in some vineyards this year, although it did not prevent grapes from being harvested. Plan for this for next year. Will you leave more buds on and plan to crop thin 30 days post bloom? Or will you plan to leave fewer buds on this year? One of the keys to vineyard management is managing on a yearly basis - every year is different, so you cannot always have the same practices from year to year. How was vineyard nutrition? Did you get your soil and petiole tests completed and recommendations back? Plan for nutrient amendment applications to build up soil health. Should anything be done differently for next year for vineyard floor management? Finally, you are running a business, so assess the health of the business. Did you make money? Did you sell your entire crop? Take a long, hard look at this and determine where you can improve efficiency and profitability without cutting corners at the expense of vine health.

14. Take a deep breath, send out your thanks, and relax with your families for a few days.

*(Source: Lake Erie Regional Grape Program Electronic Crop Update - 11/13/2008)*

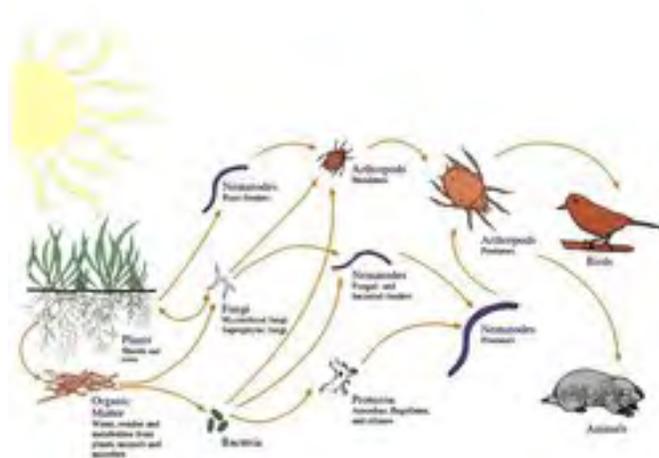
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## GENERAL INFORMATION

### How Healthy is Your Soil? Cornell Soil Health Testing Program Can Tell You

*Lee Stivers, Penn State Extension*

Researchers at Cornell University have been working on the problem of soil quality or soil health for many years, and have recently established a soil health testing program for farmers in the Northeast. This summer, two western Pennsylvania vegetable producers cooperated with me in trying out this program. Details about the testing service as well as a very comprehensive manual on all aspects of soil health can be found at <http://soilhealth.cals.cornell.edu>. (Note that Dr. Beth Gugino, lead author of this manual, is now at Penn State).



Farmers understand that healthy soils are important for producing high quality, high yielding crops. But what exactly IS a healthy soil, and how can a farmer judge how healthy his or her soils are?

According to the Cornell Soil Health Assessment Training Manual, a healthy soil has the following characteristics:

- 1) Good soil tilth, or overall physical character,
- 2) Sufficient depth for adequate root growth, with minimal compaction,
- 3) Sufficient but not excess supply of nutrients,
- 4) Small population of plant pathogens and insect pests,
- 5) Good soil drainage,
- 6) Large population of beneficial organisms,
- 7) Low weed pressure,
- 8) Free of chemicals and toxins that may harm crops,
- 9) Resistant to degradation, with a high degree of aggregate stability, and
- 9) Resilience when unfavorable conditions occur.

The Cornell soil health testing program uses a variety of field- and lab-based techniques to measure each of these characteristics, to arrive at a summary soil health rating. The comprehensive package, recommended for vegetable production, agronomic rotation crops and for first time soil health assessment, is \$75.

**So how does this work?** The test requires that you collect a soil sample, take soil penetrometer readings, and provide some general information on the sample form. Collecting the soil sample for a soil health test is very similar to collecting one for a Penn State soil nutrient test, except that you keep at least 1.5 quarts of soil rather than the pint or so of soil needed for a typical soil test. Also, the soil sample is not dried, but rather kept cool and shipped to the Cornell lab within two days. It is recommended to include a blue ice pack with the sample.

Field penetration resistance is a measurement of the soil's strength, measured with a field penetrometer. As the penetrometer is pushed through the soil layers, it measures the soil resistance, which is what a plant root would have to push its way through as it grew. Armed with my new penetrometer (Dickey-John, courtesy of my colleague Tianna Dupont; about \$200), I took 10-15 penetrometer readings for each of the four fields I tested. Readings are taken at two inch increments for 0-6 inch depth and for 6-18 inch depth.

Once the soil sample and the penetrometer data are collected, the final step is to fill in information about the specific field, including soil name, tillage depth, manure and organic matter additions, crop history and future crops.

**Results and Interpretation:** We received two reports for each soil sample we sent to the Cornell lab. The first was a soil nutrient analysis report, with information on pH, P, K, Ca, Mg and organic matter. The second report provides an assessment for soil physical characteristics (aggregate stability, available water capacity, surface and subsurface hardness), biological characteristics (organic matter, active carbon, potentially mineralizable nitrogen, root health rating), and chemical characteristics (pH, extractable P, extractable K, and minor elements). Each of these characteristics is given a rating, from which is derived an overall soil health score. The overall score can fall into one of five ranges: very low, low, medium, high, and very high.

Of the four fields we tested this summer, three received a rating of medium, and one received a high rating. More importantly, the results allowed us to look at specific characteristics that were rated lower so that we could identify ways to improve the soil health. For example, soils from one grower's farm showed above optimum P levels and significant surface and subsurface compaction. For these fields, lowering the annual application of animal manures, as well as appropriate use of tillage to address the compaction, should improve the soil health. Results from the other grower's field indicated low soil biological activity, despite regular cover cropping with rye. Adding a legume cover crop or compost could increase the biological activity in these fields.

If you are a producer, you should be interested in maintaining or improving your soil health. The tools offered by the Cornell program will help in many ways. I encourage you to download the manual, read through the sections on soil health and soil management, and consider using their soil health testing service. If you need a penetrometer, contact your local Extension educator to see if one is available to borrow. The more you know about your own field soils, the better you can manage them. (**Source:** *Penn State Fruit Times*, Oct. 24, 2011)

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## UPCOMING MEETINGS:

**December 1, 2011** - *Winter Moth: What Connecticut Green Professionals Need To Know*. 6:00 p.m.-8:00 p.m. CT DEEP Marine Fisheries Headquarters, 333 Ferry Road, Old Lyme CT. Sponsored by UConn Extension, CTPA and CNLA. Free and 2.0 credit hours for CT 3A and 3D licenses. For more information contact Lorraine Los at [lorraine.los@uconn.edu](mailto:lorraine.los@uconn.edu).

**December 8, 2011** - *Protecting Your Farm's Markets and Profitability: Writing a Practical Food Safety Plan for Small and Diversified Farms*, Brandon: Woods Market Garden, 93 Wood Land and Route 7 Brandon VT, 05733. sponsored by UVMExtension and NOFA-VT, \$20 includes lunch and handouts. For more information and registration form go to <http://www.uvm.edu/vtvegandberry/meetings/PracticalFoodSafetyDec2011.pdf>

**December 13-15, 2011** - *New England Vegetable and Berry Conference*, The Center of New Hampshire Radisson Hotel, Manchester, NH. New England Vegetable & Fruit Conference and Trade Show will be held next December 13, 14, 15 at the Radisson Hotel in Manchester, NH and will include 27 educational sessions over 3 days, covering major vegetable, berry and tree fruit crops as well as various special topics. A Farmer to Farmer meeting after each morning and afternoon session will bring speakers and farmers together for informal, in-depth discussion on certain issues. And a 100+ vendor Trade Show will be open and accessible to attendees. For more details and registration information, go to <http://www.newenglandvfc.org/>.

**January 14, 2012** – *NOFA-MA Winter Conference*. Worcester State Univ., Worcester, MA. For detailed program and registration information go to <http://www.nofamass.org/conferences/winter/index.php>.

**January 20-22, 2012** – *NOFA-NY Winter Conference*, Saratoga Hilton and City Center, Saratoga Springs, NY. For detailed program and registration information go to <http://www.nofany.org/events/winter-conference>.

**January 23-26, 2012** – *The Empire State Fruit & Vegetable Expo*. Oncenter Convention Center 800 South State St. Syracuse, NY. For more information go to: <https://nysvga.org/expo/>

**January 30, 2012** – *Vermont Vegetable and Berry Growers Annual Meeting*. Montpelier VT. For more into go to <http://www.uvm.edu/vtvegandberry/meetings/meetlist.html>

**January 31 – February 2, 2012** - *2012 Mid-Atlantic Fruit and Vegetable Convention*, Hershey Lodge and Convention Center. For more information and to register, go to : <http://www.mafvc.org/html/>

**February 11-13, 2012** – *NOFA-VT Winter Conference*. University of Vermont, Burlington VT. For detailed program and registration information go to <http://nofavt.org/annual-events/winter-conference>.

**March 3, 2012** – *NOFA-CT Winter Conference*, Manchester Community College Manchester, CT. For detailed program and registration information go to [www.ctnofa.org/events/CAOC/2012/2012\\_Winter\\_Conference.html](http://www.ctnofa.org/events/CAOC/2012/2012_Winter_Conference.html).

**March 19, 2012** - *NOFA-NH Winter Conference*. Exeter High School, Exeter NH. For detailed program and registration information go to <http://www.nofanh.org/winterConference>.

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