

Berry Notes

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IN THIS ISSUE:

MESSAGE FROM THE EDITOR

STRAWBERRY

- ❖ Day-Neutral Strawberry Varieties - Research Results

BRAMBLES

- ❖ Pruning Summer- and Fall-Bearing Raspberries
- ❖ Pruning Black, Red and Purple Raspberries and Blackberries

BLUEBERRIES

- ❖ Blueberry Pruning Brush-up - No Pun Intended!

GRAPES

- ❖ Balance Pruning Grapevines

CURRANTS/GOOSEBERRIES

- ❖ Pruning Gooseberries and Currants

GENERAL INFORMATION

- ❖ ATTRA Helps Farmers Keep Energy Costs Down
- ❖ Vermont's Mobile Berry Quick Freeze Unit the First of its Kind in the US

UPCOMING MEETINGS

Message from the Editor

Time to renew: Once again we've come to subscription renewal time for Massachusetts Berry Notes. Subscription costs remain at \$10 per year thanks to the generous underwriting by [Nourse Farms](http://www.nourse.com). Your subscription fee helps support the production of the newsletter as well as other educational activities. Stay in touch with what is happening and renew your subscription today!

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Massachusetts Agriculture Day at the State House - Tuesday, March 10, 2009 - Each year farmers as well as agriculture officials from across the Bay State visit their legislators on Massachusetts Agriculture Day at the State House to discuss issues and legislation affecting their farms and communities. The event also includes a [speaking program](#), 'Agriculture Day' awards, informational exhibits and a reception featuring Massachusetts's farm and specialty food products. To learn more about MA Agriculture Day at the State House, please contact Lisa Damon at lisa.damon@state.ma.us or at 617-626-1731.

STRAWBERRY

Day-Neutral Strawberry Varieties – Research Results

Kathy Demchak, Penn State University, Willie Lantz, Maryland Coop. Extension, Harry Swartz Univ. Maryland

During 2008, two variety trials on day-neutral strawberries were conducted. One took place at Penn State's Horticulture Research Farm at Rock Springs, PA and the other at Harry Swartz's farm in Garrett Co., MD. Here's a synopsis of the trials and plant performance.

Plants were grown on plastic-mulched raised beds, and were planted on June 6 in PA (late due to wet soils) and on May 7 in MD. The main plant source was plug plants which were grown in Maryland, originating as dormant plants that were trimmed and grown in plug plant trays. With the cultivar Evie 2 in the PA trial, dormant plants were also planted for comparison to plug plants. Yields were low relative to normal yields for the PA site, perhaps due to a combination of late planting date and using black plastic instead of reflective plastic this year.

'Seascape' was included as the current industry standard for day-neutrals. It was a consistent performer in the trials, and was the highest yielder in the MD trial. This variety has notable sweetness, a nice red color, and average size. It can be susceptible to powdery mildew, and tends to split when it rains.

'Tristar' was also included as an industry standard in MD. Compared to 'Seascape', it produced 1/3 less fruit, and had smaller berries (8.9 g for 'Tristar', 12.5 g for 'Seascape').

'Albion' had similar yields to 'Seascape' in PA, but yields were low in the MD trial. In PA, this berry could have passed for a 'Camarosa' that decided to be a day-neutral. It was large (mostly long), firm, had a perfect berry color, and good (but not great) flavor. It had the highest percentage of marketable fruit of all, being the only one that didn't split in the rain. Even though it was

a bit too firm, the size alone makes it worth trying.

'Everest', 'Evie 2', and 'Evie 3' had very similar berry quality. All were fairly soft, medium-red colored, and flavor was average, reminiscent of the June-bearing 'Latestar'. In PA, 'Everest' and 'Evie 3' were the two highest producers in the trial at 1.16 and 1.01 pounds of marketable fruit per plant. 'Evie 2' had greatly improved berry size over 'Everest' and 'Evie 3' at both sites, but yields were low. Plug plants and dormant plants of 'Evie 2' had nearly identical yields, but yields were shifted to later in the season when dormant plants were used.

A few **numbered selections** were tried. One in particular from Five Aces Breeding has *Fragaria moschata* (musk strawberry) in its background. It produced yields that would be marketably high, but berries tended to have a flattened shape. There was a range of preferences for the flavor. A numbered selection from the USDA-Beltsville breeding program appeared to have some real potential, but there were only enough plants for the MD site, so another look would be in order before reaching conclusions.

For those wanting more information on the trial, results will be discussed at the Mid-Atlantic Fruit and Vegetable Convention. Also, additional results and details on plant establishment will be posted shortly on the NE SARE Web site in an annual report for this trial, along with other annual reports that are already posted. Info is at http://www.sare.org/reporting/report_viewer.asp?pn=LNE06-241. The Vegetable & Small Fruit Gazette The Pennsylvania State University 7

This research is part of the project "An Integrated Approach to Developing a Day-Neutral Strawberry Production Industry", LNE06-241 and is funded through NE SARE. (*Source: The Vegetable & Small Fruit gazette, Vol 13, No. 2, Feb. 2009*)

RASPBERRY

Pruning Summer- and Fall-Bearing Raspberries

Marvin Pritts, Cornell University

Plant growth can be manipulated by growers to achieve long-term increases in production of quality fruit. Pruning affects plant growth rate, fruit quantity and size, soluble solids (sugars), disease susceptibility, ease of harvest, and spraying efficiency. Brambles respond significantly to pruning, but these practices are usually the most expensive and time-consuming part of an operation. Growers must use care when choosing pruning strategies. The following discussion presents different types of

pruning methods for primocane fruiting and floricanefruiting brambles that best promote high yields of high quality fruit.

Primocane-Fruiting (fall-bearing) Raspberries

Primocane-fruiting raspberries produce fruit at the top of first-year canes in late summer. If allowed to overwinter, these same canes will produce fruit again in early summer of the second year. However, the quality of this early summer fruit is inferior to both the late summer

primocane crop and summer crops of floricanefruiting types. Also, harvesting the early summer second-year crop is difficult because of interference from new primocanes. Likewise, harvesting the late summer primocane crop is difficult because the primocanes are thinner and taller when the second-year canes are allowed to grow, too. Most growers sacrifice the early summer second-year crop in favor of a smaller, but higher quality late summer primocane crop. The smaller yield of a single late summer primocane crop is offset by the ease of management.

To prune primocane-fruiting raspberries for a single late season crop, the canes need only be cut to the ground in early spring. New canes will grow each year and fruit in late summer, the canes will be cut early the following spring, and the cycle continues. It is important to cut old canes as close to the ground as possible so that buds will break from below the soil surface. If canes are not cut low enough, fruiting laterals may form on any remaining cane portion. These fruiting laterals are not healthy; they are entry sites for insects and disease pathogens. Also, any fruits that form will most likely rot, attracting pathogens and creating a source of inoculum (disease-conducting material) for the late summer crop. All canes that are cut from the planting should be removed from the area and destroyed. In warm climates, the primocane crop can be delayed by mowing the young primocanes a second time when they are approximately 1 foot tall. Pinching the primocanes (removing the growing tip) in July to stimulate growth of laterals will also delay fruiting. This is sometimes done to delay harvest until after the intense heat of July.

The timing of cane cutting is also important. Carbohydrates move from plant leaves into the crown in autumn, and from the crown to the buds in early spring. If canes are cut before all the carbohydrates reach the crown in autumn, the new canes may not be as vigorous the following year. Canes can also be cut too late, after carbohydrates have moved into the buds. From December through February, most carbohydrates are in the crown, so this is the ideal time to cut canes.

Yield of primocane-fruiting types is influenced mainly by (1) the number of canes per unit area and (2) the number of berries per lateral. Growers can influence the number of canes produced by plants. Since large numbers of canes do not seem to decrease fruit size in the fall crop of primocane-fruiting raspberries, growers should try to produce as many canes per area as possible. This can be done by planting narrow rows and more rows per acre. Row widths of 12-18 inches are considered ideal for harvesting. The distance between rows should be wide enough to allow available equipment to pass. The other factor influencing yield, the number of berries per lateral, generally depends on the particular cultivar being grown.

The grower has little control except to choose productive cultivars.

Floricanefruiting (summer-bearing) Raspberries and Blackberries

Floricanefruiting brambles produce fruit only from buds on second-year canes. Unlike primocane-fruiting raspberries, these canes must remain intact throughout the winter and following growing season, until the completion of harvest. Also, during second-year flowering and fruiting on floricanes, new first-year primocanes are growing. These primocanes interfere with spraying and harvesting, shade the leaves and laterals of floricanes, and compete for water since they share a single root system. This interference must be minimized to obtain a high yield of fruit each year. Five general methods of pruning floricanefruiting brambles are described below. Each method will produce different results in the growth of primocanes and floricanes of floricanefruiting crops. Also, with the following methods, row widths should be maintained at no greater than 18 inches.

Conventional: No Mowing or Suppression of Primocanes

This training system is traditionally used by bramble growers in the Northeast. Primocanes emerge and are permitted to grow throughout the season. The following year, they become floricanes, flowering and fruiting as new primocanes. Immediately after fruiting, however, the floricanes are cut at ground level and destroyed. Some carbohydrates are lost by cutting canes in summer.

However, this loss is offset by the advantages of reduced disease inoculum and a reduction in dormant season pruning. In early spring, all remaining canes are topped (headed back) to a convenient height for picking, since little vegetative growth occurs in the second season. Canes are thinned to a desired number, usually 3-4 canes per square foot. When thinning, the most vigorous canes should be selected to produce the next crop - those with good height, a large diameter, and no visible symptoms of disease, insect damage, or winter injury.

Alternate Year Mowing

Primocane interference among floricanes is reduced by alternately mowing half of the planting to the ground each year during the dormant season. In the spring after mowing, primocanes will emerge and grow without interference from fruiting canes. The following year, the floricanes will flower and fruit. Although primocanes will also grow in the fruiting year, all canes will be cut to the ground during the next dormant season. Advantages of this method are that no detailed cane thinning or pruning is required, and spray material costs are reduced approximately 50%. Disadvantages include a reduction in fruit quality, berry size, and yield of approximately 30%

for most cultivars, since only half the planting is fruiting in any one year.

Mowing with Primocane Suppression

The reduction in yield caused by alternate year mowing can be recovered over the short-term by removing all primocanes from the plant row during the fruiting year. The elimination of primocanes after they begin growth is called "suppression." After the first few flushes of growth are removed, primocanes eventually will be allowed to grow. A system that involves mowing in one year, followed by primocane suppression in the second year, is truly biennial - - primocanes grow without interference from floricanes, and floricanes grow without interference from primocanes.

Removing primocanes, however, is not easy. Dinitrophenol products can no longer be used, so growers must find other ways to remove primocanes until new products are developed. Some growers have reported success with Gramoxone, Scythe and Goal. The advantages of this method are the ease of pruning when done in early spring, and a reduction in spray materials cost. Disadvantages are a reduction in yield over the long-term, since only half the planting is fruiting in any one year, and the cost of primocane suppression (labor, materials).

Primocane Suppression without Mowing

The highest long-term yields and largest berry sizes have resulted from a combination of selective floricanes thinning and suppression of primocanes in late. If primocanes are suppressed when 6-8 inches tall, shading on the lower portions of floricanes is reduced. Harvesting is easier because smaller primocanes cause less interference.

Primocane suppression has also been reported to increase hardiness. Since there is less shading and fewer demands for water, fruit size and productivity of lower laterals are increased. Primocanes of vigorous cultivars can still grow to a sufficient height for adequate fruiting the following year.

Primocanes should not be suppressed until the planting is at least three years old. Primocanes contribute large amounts of carbohydrates to the bramble plant, and

repeated suppression will reduce carbohydrate levels. Therefore, suppression should be skipped every third or fourth year to allow the planting to recover from the general reduction in vigor. Weak hills or sections of rows should not be suppressed at all. There are conditions under which suppression of primocanes is not recommended. If a fruit crop load is particularly heavy, primocane growth may decrease naturally as developing fruit demands all the plant resources. Also, if primocanes are suppressed in regions with short growing seasons, they may be too short at the end of the growing season. Suppression is not recommended under the above conditions, or whenever the plant is stressed, such as from a lack of moisture or a nutritional imbalance.

Advantages of primocane suppression are: (1) increases in fruit size and quality, (2) increases in production, and (3) reduced cane numbers. Disadvantages are: (1) longterm reductions in stand vigor and (2) expenses involved with primocane suppression or elimination.

Partial Primocane Suppression

Yield and quality may be increased without suppressing all the primocanes in a planting. Removing all but 4 or 5 primocanes per linear foot of row will increase yield and fruit quality in floricanes of some cultivars. For this method, growers select the primocanes in late spring which will be carried into the following year for fruiting. Rejected primocanes are cut to ground level when 8 inches tall. The raspberry plant uses resources for the current fruiting canes and the remaining primocanes, rather than for many primocanes which would eventually be removed. Primocane regrowth is ignored until the dormant season when these short canes are removed. Advantages of this system are: (1) selected primocanes grow for an entire season instead of the partial season permitted in complete primocane suppression, (2) rejected primocanes are removed when small, succulent, and easy to handle, as opposed to large and thorny, and (3) fruit size and quantity of current season is increased. The major disadvantages are: (1) primocane selection is difficult when leaves are on the plant, and (2) suppression of undesirable canes requires much labor. (*Source: New York Berry News, Vol. 3, No.2, Feb. 2004*)

Pruning Black, Red and Purple Raspberries and Blackberries

Ray R. Rothenberger, University of Missouri – Columbia

Raspberries produce fruit on 2-year-old canes, which die after the crop has matured. The pruning of black and purple raspberries consists of:

1. Tipping the new canes when they reach a height of 18 to 20 inches, thus forming a branched cane that is capable of producing more fruit than an unbranched cane. Branched canes are also more able to support the crop off the ground than unbranched canes.

2. As the buds break in the spring, the branches on the canes should be shortened to 8 to 12 inches (longer if the plant is supported by stakes or a wire trellis).

3. After the crop is harvested, the old fruiting canes should be removed at the soil line. (The removal of the old canes as soon as the crop is harvested is a good disease control practice since it removes an important source of infection.)

Pruning red raspberries

Red raspberries should be allowed to produce long, unbranched canes rather than branched canes like the black and purple varieties. The new canes are, therefore, unpruned during their first season's growth. At the start of the second season, they are topped to a height that will permit them to support themselves and keep the fruit off the ground. If the plants are supported by stakes or a wire trellis, they can be pruned to permit more fruiting wood. The old canes die after the crop is matured and they should be removed as early as possible in order to remove sources of disease.

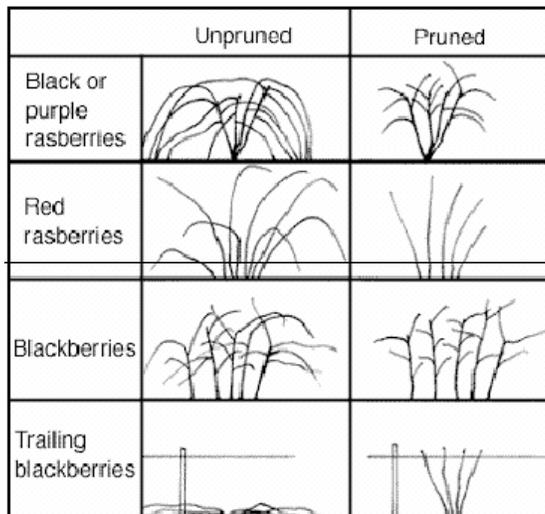


Figure 1. Pruned and unpruned raspberries and blackberries

Pruning upright blackberries

Standard American varieties of blackberries are usually able to support themselves without stakes or a trellis. Pruning is similar to that of black and purple raspberries except the canes grow taller. It consists therefore of:

1. Tipping the new canes at a height of 24 to 30 inches to form branched canes.
2. As growth starts, remove all dead and weak canes or branches and head the branches back to a length of 12 to 15 inches or to the degree that the canes can support the expected crop.
3. After the crop is harvested, remove the 2-year-old wood to stimulate the new canes and remove sources of diseases.

Pruning trailing blackberries (Dewberries, Boysenberries, etc.)

Trailing blackberries are not grown extensively in Missouri because of a lack of hardiness and their susceptibility to bramble diseases. Like other brambles, they bear fruit primarily on 2-year-old wood. The one-year wood is usually allowed to grow on the ground where it

can be mulched for winter protection. As growth starts in the spring, these canes can be lifted up and tied to a trellis or stakes for fruiting. Weak canes should be removed as well as all dead wood and the stronger canes shortened to fit the trellis or stakes (usually 36 to 40 inches high). After the crop is harvested, the old fruiting wood is removed while the new wood is permitted to remain on the ground until the next spring (see Figure 1).

Additional suggestions

1. In tipping the new growth of black and purple raspberries and upright blackberries, each cane

should have the growing tip pinched out as it reaches the desired height. If several inches of the cane are removed, the side branches are severely stunted.

2. Trailing blackberries and red raspberries should be supported by stakes or a wire trellis to produce maximum crops. The same is true of black and purple raspberries, especially for the first crop (2-year-old plants). These will support themselves fairly satisfactorily after the second year.

3. All brambles in Missouri are subject to several serious plant diseases that are difficult to control. As a result, the plantings are usually short-lived and require frequent replacement.

4. Upright blackberries are frequently affected with a sterility condition in which the plant blossoms normally but produces no fruit. There is no control for this condition and such plantings should be removed.

5. A thorough spray program will assist in producing satisfactory crops of both raspberries and blackberries. (Source: University of Missouri Ag. publication G6000, <http://muextension.missouri.edu/xplor/agguides/hort/g06000.htm>)

BLUEBERRY

Blueberry Pruning Brush-up – No Pun Intended!

Cathy Heidenreich, Cornell University

Pruning is one of the few small fruit chores commonly occurring at this time of year. It is also the most “hands-on” task associated with blueberry production, other than harvesting or planting. How to get the most bang for your buck in terms of pruning? Take a minute to review key concepts below before you prune. Fine tune

your pruning strategy accordingly to maximize efficiency and minimize cost expenditures both now and later in the season.

Why Prune?

Is pruning just another item on your production schedule to be checked off, or do you really take time to consider what you hope to achieve by pruning? This season, re-focus on the reasons why we prune blueberries. Pruning dollars have direct and indirect impacts on fruit dollars for the current season, and over the life of the planting. Below are some of the benefits of pruning:



1. Maintains bush productivity and vigor through elimination of older, less productive canes and rejuvenation of new cane growth.
2. Facilitates harvest by developing appropriate growth habit.
3. Increases air circulation, reducing conditions favorable for disease development.
4. Reduces fruit numbers and opens canopy to sunlight, improving sweetness and fruit size.
5. Removes winter-injured, damaged, insect-infested, or diseased plant parts.

as opposed to complete cane removal. Special consideration is needed for varieties with spreading habits. In this case you may be tempted to remove all those canes sprawling into alley ways; care must be taken to leave sufficient canes for fruiting.

Is this a young planting you are pruning for training purposes? Is it an older planting that needs to be rejuvenated? How many canes should be removed from each

plant? Are there insect or disease issues that maybe re-dressed through detail pruning? How will brush from prunings be dealt with?

On to the Main Event

In general, prune to an upright growth habit with an open canopy allowing good light penetration. Do this in four easy steps. First, remove any damaged canes, i.e. winter injury, insect or disease damage, or breaks. Second, remove canes that rub against another cane, to prevent spread of canker diseases. Third, remove older canes and those canes obstructing movement through the alleys. Fourth, remove any short, branched canes within the canopy; fruit on these



Figure 1. Fusicoccum cankers on cane.



Figure 2. Phomopsis canker, sometimes mistaken for winter injury. Inset: Close-up of fungal spore-producing structures on cane surface.

Before You Prune

Get your equipment assembled and ready to go. Sharpen all blades. If you are using pruning guns, be sure equipment is fully operational and carry out any routine maintenance that may be needed.

Decide on a pruning schedule, based on your particular planting(s). What variety or planting will you do first? Does this particular variety need special pruning? Pruning stimulates vegetative growth. It follows, then, that weaker bushes will benefit from more pruning than vigorous bushes; they may also require detail pruning

interior canes generally ripens too late to be harvested. Cut canes to be removed as close to the crown as possible. Avoid leaving stubs which become ideal homes for canker-causing fungi. When branches are removed, make cuts as close as possible to the main cane; avoid leaving short, stubby branches for the same reason.

Plant Stage	Pruning suggestions
1-2 year old plantings	Little pruning required. Promote vegetative growth by rubbing off flower buds in March or April. Alternatively prune off shoot tips where flower buds are located.
3 year old plantings	IF more than 2 new canes were produced previous year, leave the 2 healthiest new canes; remove the remaining new canes.
3-8 year old plantings	Continue light pruning, leaving the 2-3 best new canes from previous season, until plants reach full size. Eight year old plants should have 10-20 canes of various ages.
> 8 year old plantings	Annual removal of 8 year old canes. In general, 20% of older wood (1 out of every 6 canes) may be removed without reducing yield. Berry numbers may be lower but fruit will be larger in compensation.
Plantings needing rejuvenation	Strategy 1: Remove old, unproductive canes, leaving 2 or 3 older canes and all younger canes. IN successive years, remove up to 20% older wood until new cane growth occurs. Keep 2-3 new canes and continue to remove 20% oldest canes. Strategy 2: Cut all canes to ground level (delays harvest 3 years). Thin new canes to most vigorous 6-10 canes. Strategy 3: Summer hedge immediately after harvest; selectively remove dormant canes.



Figure 3. Bush infected with blueberry crown gall.



Figure 4. Close up of gall on cane. (Pictures courtesy W. Bertram)

Pruning to reduce disease and insect pressure One of the benefits of pruning referred to above is reducing disease and insect pressure. Disease pressure reduction in blueberries is a one-two punch, when it comes to pruning. Two of the most common blueberry canker diseases, Fusicoccum (Figure 1) and Phomopsis (Figure 2), overwinter in cankered wood. These fungi are also particularly adept at colonizing dead wood, particularly pruning stubs. Removal of cankered canes and avoiding cane or branch stubs during pruning will reduce the number of new infections occurring during the season. Prune out and burn diseased canes and branches, taking care to remove all infected (brown) tissue below the cankers. Cultural practices (maintaining plant health, minimizing winter injury and early spring frost damage) and pruning out dead wood are more important in controlling canker diseases that sprays, so now is your chance! Canker disease severity and spread may be

further minimized if new cankers are pruned out as they appear during the growing season.

Pruning further reduces disease development by maintaining an appropriate growth habit and opening the canopy. Cane, leaf, and fruit surfaces dry more quickly when good air circulation occurs throughout the canopy/planting, minimizing conditions favorable for disease development. This is true not only for canker diseases, but other blueberry diseases as well.

A report of another, less common blueberry disease also surfaced this past season, blueberry crown gall (Figures 3 and 4). This disease is a sporadic problem and is not frequently seen in New York plantings. It is caused by the bacterium, *Agrobacterium tumefaciens*, and may occur in propagation beds and young plantings. It is sometimes found in older plantings as well. If you happen to have this disease in your planting, take some of these precautions during pruning:



Figure 5. Scale insects on blueberry cane.



Figure 6. Scale on young twig.
(Pictures courtesy G. Loeb, NYSAES-Cornell)

1) Prune bushes during dry weather, 2) Frequently disinfect pruning equipment. A 10% bleach solution or 70% ethyl alcohol (shellac thinner) solution works for this purpose, and 3) Remove and destroy diseased tissue. Insect pressure may also be reduced through good pruning practices. Scale insect infestations are more frequently found in poorly maintained bushes. Good pruning practices go a long way toward reducing scale insect problems. Keep an eye out for the hard -covered female

season. Watch during mid to late June and July for new galls. Prune out and destroy them as they appear. (See a movie on this pest at <http://www.nysaes.cornell.edu/pp/extension/tfabp/movies.htm>.)

Final considerations

Brush removal is an important part of the pruning process. Several options are available depending on the layout of your plantings and available equipment. One method is to



Figure 7. Older stem gall with emergence holes; younger galls to the left and below.
(Picture courtesy K. Cox, Cornell-NYASES)



Figure 8. Insect stem gall with overwintering larvae.
(Picture courtesy J. Burth, Oswego County CCE)

insects on small twigs and branches while pruning (Figures 5 and 6). If scales are present, schedule a dormant oil spray for early spring during bud swell.

Insect stem galls were particularly prevalent on blueberries during the 2006 growing season and several growers reported problems with this insect pest (Figure 7). The tiny wasps overwinter as larvae in the galls (Figure 8). Adult wasps emerge in early June and lay eggs on twigs, causing new galls. Currently there are no products available for control of this insect.

Your only recourse in this instance is to prune out and burn the galls now to reduce your insect stem galls next

chop brush in place using PTO driven equipment such as Bush Hog or a flail mower. Another option may be to push brush out of alleyways and burn, chop, or chip it off site.

Is the job done? Not quite. What remains is to take time next fall and winter to evaluate how well your pruning strategies for the 2007 worked, and determine what needs to be done in 2008 to keep those pruning dollars yielding better blueberries, and returns on your investment.

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 (Source: New York Berry News, Vol. 5, No. 11, January 2007)

GRAPE

Balance Pruning Grapevines

Mark Chien, Penn State Cooperative Extension

Pruning is not instinctive. When I look at a rose bush or an apple tree in my yard, I panic. We all know that there is a “right” and a “wrong” way to prune a plant – and most of us are pretty sure we will do it wrong. Pruning your vines is something worth learning how to do correctly. While vines are very forgiving, over time, if pruned incorrectly, their shape can be lost and they will become more disease prone and less productive. Its not

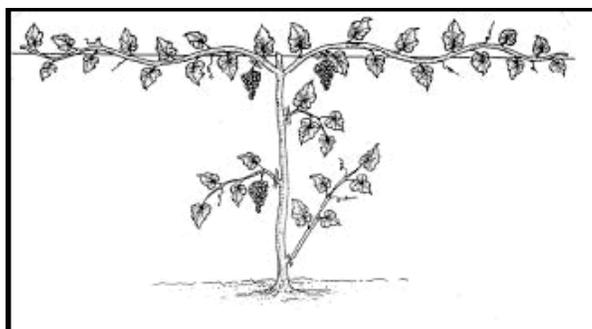
rocket science, but does require intelligence, creativity and practice. Every vine is different, and you need to know how to shape and mold each vine to its ideal form. Pruning is the act and art of making cuts to remove living vine parts. But pruning is also an important cultural practice in the long-term

maintenance of your vineyard. Some would argue that it is the single most important part of the annual vineyard cycle. Its almost impossible to explain how to prune a vine without actually demonstrating how to do it. Therefore, I’ll focus on balanced pruning as a viticultural concept and hope that those who need pruning lessons will attend a workshop.

I would urge every grower to balance prune at least a few vines for every acre of vineyard, if nothing else, just to get an idea of the general vigor of your vines. This information, along with petiole and soil tests, and you own astute observations, can help you plan an effective strategy for managing your vineyard. It will also help you to make critical decisions regarding any future planting you may do.

The objective of balance pruning is to make the major step towards achieving a balanced vine in the coming growing year. A vine in balance is one whose vegetative and reproductive functions are in equilibrium. If you can achieve this utopian vine condition – you will likely harvest ripe fruit and have a healthy vine that will age gracefully and survive the winter. A vine’s size is

determined by the sum of all its contributing parts – roots, shoots, and permanent wood. As a matter of convenience, only the new growth can be measured, so the number of nodes left after pruning is correlated to the amount of wood that is removed. For an excellent explanation of vine balance please read Stan Howell’s treatise on this subject titled “Grapevine Crop Control” in the Sept/Oct, 2000 issue of Wine East magazine.

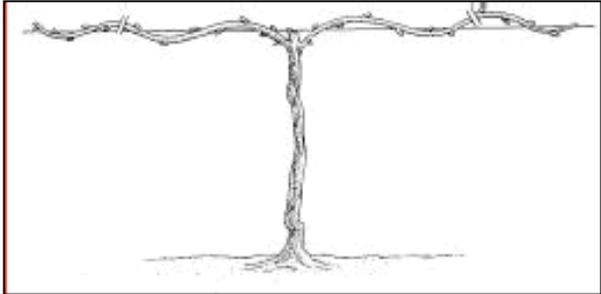


Most of us have wrestled with over-vigorous vines. The reasons why these vines often do not produce high quality fruit are well documented. Fortunately, contemporary viticulture technology in the form of rootstocks, divided trellis systems, deficit irrigation and many other

practices allow growers to bring vines into balance in awkward sites. Each winter a vine sheds up to 90 percent of its previous year’s wood. The quality and quantity of what remains is of critical concern to both the vine and the grower. The number of buds that a pruner leaves will directly influence crop load and vine vigor in the coming year. – and thus the quality and quantity of fruit, bud fruitfulness, disease incidence and more. To balance prune a vine is to make an attempt to equate the number of nodes retained at pruning with vine capacity, the goal being to maintain a balance between vegetative growth and fruit production. This idea was first proposed by Nelson Shaulis at Cornell in the n1940’s, and has persisted to this day as a key concept in the production of high quality wine and juice grapes.

The idea has since been refined by disciples of Dr. Shaulis, most notably Richard Smart from Australia. Brian Freeman does a good job of describing balanced pruning as a way of quantifying the intuitive process of an experienced pruner. When standing in front of a big vine, it makes sense to leave more buds to allow the growth of that vine to spread out. Conversely, a wimpy vine will have to be pruned “harder”, i.e., to fewer nodes, in order

to stimulate the growth of those shoots. In the classic balanced pruning formula, a set of recommendations is given for specific varieties – but these can be adjusted over time for your vines. For example, for Concord the formula is 30 plus 10. That means for the first pound of pruning weight – the measured amount of one-year old wood you remove from your vine – you should leave 30 nodes/ The “plus 10” refers to the number of nodes you should leave for each additional pound of pruning weights. Numbers are given for many varieties on a 20 + 20 basis. Lider et al recommends 10 + 10 for Chardonnay based on California growing conditions. Because of their relative delicacy, it is suggested that vinifera vines be double pruned – leaving twice the number of necessary nodes on the first pass, and fine tuning once the threat of winter injury and/or frost damage has passed. It’s important that only count be used for pruning decisions.



Illustrations from Washington State University; Spokane County website <http://spokanecounty.wsu.edu>

Spurs typically have basal buds that can produce additional, often non-fruitful shoots. Native and vinifera varieties usually don’t produce many adventitious buds, but some hybrid varieties, like Seyval, are notorious for overproducing. Many growers regularly shoot thin extra shoots between budbreak and bloom.

Richard Smart has formulated his own Golden Rules that provide a guide to achieving a balanced vine. Rule #1 recommends 12 – 16 buds per pound of pruning weight. The second rule is to have four to five shoots from count bud positions per foot of canopy. If you have more than this, you need to thin out excess shoots. He notes that these two formulas can be in conflict with each other. The trick is to figure out how to get the node number in rule 1 into the space allocated in rule 2. In a vigorous vine situation, this often means dividing the canopy or removing vines to increase the linear part of the equation.

You may wonder what good balance pruning will do for you once your linear vine spacing is already established once the trellis is in the ground. Good questions. If you are getting node numbers far beyond what your trellis can accommodate (approx. 0.4 lbs/ft), it may be time to consider splitting the canopy, if possible – at the least, take measure to devigorate your vines. If the numbers are low, then you should consider ways to invigorate your vines, or perhaps interplanting. Again, the goal is to

achieve balance between the vegetative and reproductive needs of the plant.

There are other important indicators of vine capacity you may wish to use to determine your pruning level. Cane weight and length can be instructive. Smart and Coombe

estimate a cane weight for a moderately vigorous vine at 0.75 – 1.5 ounce per cane. Average length would be 15 to 20 nodes. I suppose a person could spend the entire winter taking measurements from vines and a) never find the perfect vine and b) never get around to actually pruning the vines. All of these numbers are pertinent and useful guidelines as you gain your own feeling

about the capacity of your vines. In the vineyard I managed we had distinctive areas of similar vine size and would measure vines in each zone and prune accordingly. We might balance prune five vines in an acre just to get an idea if our bud counts were in the ballpark, Please buy a reliable pocket hand scale - you can find one by looking under hanging scales in your favorite search engine (go to fishing scales), a 2 – 3 pound maximum scale is fine, as long as it reads in ounces.

Finally, the inevitable disclaimer. It is impossible to absolutely quantify viticulture into a simple set of numbers and formulas. Your accumulated experience with your vineyard is more valuable than anything you may read here or anywhere else. Use your intuition as a guide. Do not be afraid to experiment with pruning levels, trellis systems, training systems, canopy management techniques and whatever other tools or concepts are available to the modern grape grower that will enable you to produce the best quality wine grapes possible from your vines. That’s the challenge, and the fun part of growing wine. For printed pruning instructions and more details about balanced pruning, please refer to the following excellent reference resources:

1. **Viticulture. Volume 2: Practices.** 1992. B. G. Coombe and P. R. Dry. Winetitles. Adelaide, Australia. ISBN 1875130012
 2. **Mid Atlantic Wine Grape Growers Guide.** T. Wolfe and B. Poling. <http://www.ces.ncsu.edu/resources/winegrape/>
 3. **Sunlight Into Wine.** 1991. Richard Smart. Winetitles. Adelaide, Australia. ISBN 1875130101
- (Source: PennState Grapevine Newsletter, Fall 2001)

For an excellent on-line narrated slide presentation of grapevine pruning, go to:

Part I: Grapevine Anatomy and Vine Balance - <http://connect.ag.vt.edu/westover1/>

Part II: Selecting Fruitful Wood and Balance Pruning - <http://connect.ag.vt.edu/westover2/>

Part III: Cold climate pruning strategies - <http://connect.ag.vt.edu/westover3/>

Vineyard Balance Pruning/Cropping Record Sheet - <http://www.vaes.org.vt.edu/AHSMITHJAREC/Pruning-Cropping%20Record%20Sheet.pdf>

CURRENTS AND GOOSEBERRIES

Pruning Gooseberries and Currants

B. C. Strik and A.D. Bratsch, Oregon State University

Prune when the plants are dormant in late winter. Red currants and gooseberries fruit in a different way from black currants, so you should prune them differently.

Red currants and gooseberries

These produce most of their fruit on spurs that are located on 2- and 3-year-old wood. Canes (stems arising from the base of the plant) that are 4 or more years old are no longer productive; remove them when you prune. After pruning, a healthy bush should have 9 to 12 main canes--3 to 4 each of 1-, 2-, and 3-year-old canes. Remove all canes older than 3 years and canes that are damaged or diseased. Prune to form an open center and remove canes that are low to the ground.

After planting, a yearly pruning schedule would look like this:

Year 1. At the end of the planting year, remove all but 6 to 8 of the most vigorous canes during the dormant period. Make your pruning cuts as close to the ground as possible.

Year 2. At the end of the second season, leave 4 or 5 new 1-year-old canes, and keep 3 or 4 of the 2-year-old canes.

Year 3. Keep 3 to 4 canes each from 1-, 2-, and 3-year old growth.

Year 4. At the end of the fourth and following years, remove the oldest canes and keep 3 to 4 new 1-year-old canes to replace the older canes you removed.

Black currants

Black currants produce best on 1-year-old wood. Strong 1-year-old shoots and 2- or 3-year-old canes that have

an abundance of strong 1-year-old shoots are the most productive.

When you prune, keep a total of 10 to 12 canes per mature bush -about half should be 1-year-old shoots. You can leave a few more shoots if the plant vigor is very high. Remove all shoots that are more than 3 years old. Make your pruning cuts close to the ground.

Because black currants bear most of their fruit on 1-year-old wood, you can prune them to produce on alternate years. In this system, prune plants to the ground during the dormant period. This causes the plant to produce many new shoots; no fruit will be produced the season after pruning. Don't prune the plants in the next dormant period, other than removing diseased wood or weak growth.

The following year, they fruit on the 1-year-old wood. Prune your plants to the ground again the following dormant period, repeating the cycle. In this system you get fruit produced every other year on a particular plant. To get fruit each year, you can have half your plants fruiting in one year and the other half the next.

If you're growing black currants in a hedgerow, it's simplest to follow the alternate-year pruning method. Training to a trellis. Currants and gooseberries can be grown as a fanshaped bush on a trellis. Plants trained this way look attractive and produce a good crop of well colored fruit. To train to this system, plant rooted cuttings along a trellis with 3 to 5 wires. Space single plants at 3 to 4 feet. Tie side branches to the wires as they develop. To develop a narrow fruiting wall, use the pruning techniques mentioned for the type of currant or gooseberry you're growing. This system requires a lot of labor and patience—only gardeners with a lot of experience should try it! (*Source: Oregon State University Home Horticulture Publication EC 1361, online at <http://extension.oregonstate.edu/catalog/html/ec/ec1361/>*)

GENERAL INFORMATION

ATTRA Helps Farmers Keep Energy Costs Down *ATTRA National Sustainable Agriculture Information Service*

In these tough times it makes a great deal of sense to reduce energy use and costs. ATTRA offers tools to help farmers and ranchers evaluate and improve their energy systems.

Farm Energy Saving Tips

Energy saving on farms and ranches should begin with an inventory or assessment of energy use. Mentally prepare yourself to take charge and get to the bottom of things. Start by reviewing your energy bills – there's no better investment of your time. Some utility companies offer energy audits tailored for agricultural customers. If your provider does not offer audits, they may be able to refer you to someone who does. A number of Web sites offer agricultural energy calculators to begin this process. See below for more on these tools.

Maintain tractors and stay up on injector and filter schedules.

Use the proper viscosity oils and seasonal fuels. Make fewer passes over fields by using tillage calculators, and keep ground implements sharp. Avoid excessive idling. Keep tire pressure at the lowest recommended level and avoid over-ballasting. Tillage is a main fuel use for many operations. Tillage calculators are available at this site: ecat.sc.egov.usda.gov.

Reduce synthetic fertilizer use. Nitrogen fertilizers are particularly heavy users of natural gas in the manufacturing process. When these fertilizers are applied in excess or at the wrong time, they can pollute surface water and groundwater.

Consider conservation tillage and no-till management strategies. These approaches reduce

diesel fuel consumption, preserve topsoil structure, and conserve soil carbon. Conservation tillage has demonstrated measurable reductions in carbon emissions over the past decade.

Change lighting strategies. Switch incandescent lighting to compact fluorescent lamps in barns, sheds, and outbuildings. Consider changing out yard lamps with more focused fixtures that save energy. Motion detectors on lights work well for many applications.

Irrigate efficiently. This usually means a combination of mechanical and management upgrades to your system. Lowering pressures on pivot irrigation systems can save considerable energy. Use pressure gauges, monitor soil moisture to avoid over watering, and examine sprinkler nozzles regularly for wear. Studies in Western states

indicate that about 25 percent of electrical energy used in irrigation is wasted due to poor pump and motor efficiency.

Increase electric motor efficiency. Rebuild older motors and gain several percentage points in motor efficiency. Experts advise considering premium efficiency motors (2 to 4 percent more efficient than standard motors)

in all new installations, or when the cost of rebuilding exceeds 65 percent of the price of a new motor. Match the new motor output to the task at hand and consider variable-speed drives as appropriate

Manage stored fuel. A 300-gallon unsheltered above-ground tank can lose up to 10 gallons per month through evaporation during warm months, particularly when painted a dark color. Silver-coat the tanks and put up a rudimentary shelter to keep them shaded. Pressure relief caps also reduce evaporation loss.

ATTRA is now offering farm energy technical assistance. We are ready to take your farm energy questions when you call our toll-free line, 1-800-346-9140 (English) or 1-800-411-3222 (Spanish). Our staff members have hands-on experience with a wide range of energy-saving approaches and renewable energy technologies. For more technical questions and requests, we can also draw on the extensive engineering expertise within our parent organization, the National Center for Appropriate Technology (NCAT).

USDA's REAP Program: A Great Opportunity for Producers

Among the provisions of the 2008 Farm Bill is the Rural Energy for America Program (REAP). Managed by USDA Rural Development, this program authorizes \$225 million in grants and loan guarantees for energy efficiency and renewable energy projects. Farms, ranches, and rural businesses are eligible. A simplified application process is available for projects costing less than \$200,000. To learn more about how the program works, see www.farmenergy.org, Web site of the Environmental Law and Policy Center. To find your state contact person for the REAP program, visit www.farmenergy.org/incentives/contacts.php

Farm Energy Calculators

The first step in reducing farm energy costs is to figure out where you use energy in your operation. One way to do this is to have someone perform an energy audit on your farm. The auditor will look at your energy consumption, suggest energy-efficient improvements and equipment upgrades, and estimate paybacks on these investments. You don't need a professional energy audit to get started, though. An amazingly diverse variety of farm energy calculators are freely available on the Internet. You can examine the energy consumption and costs of various tillage systems, crops, fertilizers, irrigation, animal housing, lighting, drying, cooling, heating, and milk harvesting and chilling. Other calculators allow you to estimate whether it would make sense to install a wind turbine or photovoltaic system, or to produce your own biofuel.

[Farm Energy Calculators: Tools for Saving Money on the Farm](#)

This ATTRA publication provides links to a variety of farm energy calculators on the Internet. Numerous calculators are listed with brief descriptions. Each has a specific focus, such as irrigation and pumps, electrical use, and fertilizer application.

Farm Energy Search Tool

(www.attra.ncat.org/farmenergysearchtool)

See ATTRA's Farm Energy Web page at www.attra.ncat.org/energy. You will find extensive resources, including publications to download and links to other organizations working to increase energy efficiency on farms and ranches. Are you looking for energy-related equipment, funding, and technical assistance in your state? ATTRA's online search tool makes it easy. Businesses are generally listed under the state where they are located, although many companies provide regional or national service. Contact businesses to see if they serve your area. Energy-related businesses, agencies, and nonprofit organizations serving agriculture are welcome to submit listings using a simple self-listing form. This search tool was developed with funding from the USDA Risk Management Agency.

Farm Energy Publications

In addition to the publications listed here, ATTRA offers hundreds more that provide general information and specific details about all aspects of sustainable and organic agriculture. They are available to download for free from ATTRA's Web site: www.attra.ncat.org. Or call 1-800-346-9140 to order a free paper copy.

Energy Conservation and Efficiency

[Conserving Fuel on the Farm](#)

[Efficient Agricultural Buildings: An Overview](#)

[Energy Saving Tips for Irrigators](#)

[Farm Energy Calculators: Tools for Saving Money on](#)

(*Source: New York Berry News, Vol. 8, No. 2, Feb. 2009*)

[the Farm](#)

[Maintaining Irrigation Pumps, Motors, and Engines](#)

[Root-Zone Heating for Greenhouse Crops](#)

Renewable Energy Options

[Anaerobic Digestion of Animal Wastes: Factors to Consider](#)

[Biodiesel: A Primer](#)

[Biodiesel: The Sustainability Dimensions](#)

[Biodiesel Production for On-Farm Use: A Curriculum for Agricultural Producers](#)

[Biodiesel Use, Handling, and Fuel Quality](#)

[Compost Heated Greenhouses](#)

[Ethanol Opportunities and Questions](#)

[Food Dehydration Options](#)

[Freeze Protection for Solar-Powered Livestock Watering Systems](#)

[Locally Owned Renewable Energy Facilities](#)

[Oilseed Processing for Small-Scale Producers](#)

[Renewable Energy Opportunities on the Farm](#)

[Small-Scale Wind Energy on the Farm](#)

[Solar Greenhouse Resources \(online only\)](#)

[Solar-Powered Livestock Watering Systems](#)

[Switchgrass as a Bioenergy Crop](#)

[Wind-Powered Electric Systems for Homes, Farms, and Ranches: Resources](#)

Reducing Nitrogen Fertilizer and Indirect Energy Usage

[Alternative Soil Amendments](#)

[Brief Overview of Nutrient Cycling in Pastures](#)

[Conservation Tillage](#)

[Farm-Scale Composting Resource List \(online only\)](#)

[Foliar Fertilization](#)

[Notes on Compost Teas](#)

[Nutrient Cycling in Pastures](#)

[Overview of Cover Crops and Green Manures](#)

[Pursuing Conservation Tillage Systems for Organic Crop Production](#)

[Sources of Organic Fertilizers and Amendments \(online only\)](#)

[Sustainable Soil Management](#)

Reducing Food Miles and Transportation Energy

[Bringing Local Food to Local Institutions: A Resource](#)

[Guide for Farm-to-School and Farm-to-Institution Programs](#)

[Community-Supported Agriculture](#)

[Direct Marketing](#)

[Farmers Markets](#)

[Food Miles: Background and Marketing](#)

[Local Food Directories \(online only\)](#)

(*Excerpted from: Newsletter of ATTRA - National Sustainable Agricultural Information Service: A project of the National Center for Appropriate Technology (NCAT). Volume 16, Number 5, November 2008. ATTRAnews is available online.*)

Vermont's Mobile Berry Quick Freeze Unit the First of its Kind in the US

Laura McDermott, Cornell Cooperative Extension

“What can I do with my excess crop?” is a berry grower question echoed across the state. A bumper crop or the vagaries of weekend weather can impact how much of the highly perishable berry crop moves off the shelves or out of the field. Preserving berries is often done by making jams and jellies, syrups and even wines. All of these products are highly valuable but require some skill and the proper processing facility. Dehydrating berries is easy to do, but that requires a potentially expensive dehydrator that can also be expensive to operate.

Freezing berries is a relatively easy way to preserve excess berries for future sale. Frozen local berries are easy for customers to use and the preparation doesn't add much cost to the final product. Berries can be frozen in two different ways: 1) the wet pack method which involves adding sugar syrup to the berries and 2) a “dry” or individual quick-freeze (IQF). For this method, the berries need to be dried in single layers so that they don't freeze together in clumps. Berries can be stored for 6 months if kept at 0°F.

The one drawback to freezing as a means of preserving the crop is equipment. Most growers do not have access to large deep freeze units even for long term storage let alone for freezing hundreds of pounds of fruit on trays.



Flats of berries are moved along a conveyor - the fan helps to remove excess moisture before freezing

That's why the recent news from Vermont was particularly interesting.



The Vermont Agency of Agriculture was awarded a Rural Business Enterprise USDA Rural Development grant for the design and manufacture of a mobile quick freeze unit. The Vermont Department of Tourism and Marketing provided the remainder of the funding assistance for the \$40,000 unit, saying that “A vibrant farm community is an incredibly important part of Vermont's brand”. Bruce Hyde, Tourism and Marketing Commissioner states that, “Vermont is at the forefront of the local food movement, and this program is an innovative way to promote the state”.

The premise of the mobile unit was to help farmers expand market opportunities and hopefully create additional jobs. A mobile freezer unit could reduce fuel and infrastructure costs and hopefully result in greater revenues left in Vt. Farmers pockets. “The mobile quick freeze unit is the first to be used in the United States to bring processing capabilities right to the farm. This is a significant step in helping to give farmers additional processing options as well as making more local foods available to buyers,” said Vt. Secretary of Agriculture Roger Allbee at the unveiling of the unit last August.

Brian Norder, of the Vermont Food Venture Center, designed the mobile quick freeze unit and Randy Cadieux of Georgia Vt., built it. The quick freeze technology isn't new, but putting it on wheels was. The freezer is housed in an 18' trailer that can be hitched to a regular truck hitch. It is completely outfitted with trays for freezing between 400-600 lbs. of berries or vegetables per hour. The amount of produce varies with the individual size and water content of the produce item being frozen. The unit can temporarily store up to 800 lbs. of frozen produce.



Lots of storage space for trays that are a must for IQF process.



Back door of quick freeze unit - note ramp for easy access.

Farmers need to have correct wiring to accommodate the freezer which has a 50 amp plug. This is the same kind of wiring that a farm would have for a welder and may cost about \$300 to have installed. Farmers also need to supply the labor and a final storage place for the frozen product.

There are many growers in Vermont that are interested in the unit. Some vocal supporters of the project are Pete Johnson of Pete's Greens in Craftsbury, Vt. and Champlain Orchards in Shoreham, Vt.

At this time, the Vt. Agency of Agriculture is in the process of choosing a private operator through a lease-

to-own plan that should be in place by May 1, 2009. That operator will determine rates and schedule the movement of the freezer unit throughout the state. There is some hope that growers in border areas might also be able to schedule time with the freezer unit, but that decision will be made later. If you would like more information about the mobile berry quick freeze unit, please contact Helen Labun Jordan at 802-828-3828 or Helen.jordan@state.vt.us.

(Many thanks to Brian Norder for the photographs. Also thanks to VAAFM for the photo of the exterior of the mobile freeze unit. Source: VAAFM Agriview, August 23, 2008.)

(Source: New York Berry News, Vol. 8, No. 2, Feb. 2009)

UPCOMING MEETINGS:

March 4, 2009; *Good Agricultural Practices (GAPs) Food Safety Training.* 9:00AM – 4:00PM, 333 South St., Shrewsbury MA 01545. Recent contamination outbreaks for tomatoes and spinach have raised concerns about the safety of fresh produce. UMass Extension, UMass Department of Nutrition, and the MA Department of Agricultural Resources (MDAR) have teamed up with partners to implement a USDA Good Agricultural Practices (GAPs) Training & Certification Program for growers and other fresh produce handlers. For more information contact Rich Bonanno at 978-361-5650 or rbonanno@umext.umass.edu

March 4, 2009; *Berry Pest Management Update.* Erie County CCE, with polycom site at Chautauqua County CCE. DEC pesticide recertification credits available. The pre-registration fee, if received by February 28th, is \$20.00 for CCE enrollees and \$30.00 for non-enrollees. The cost will be \$10.00 more at the door. For more information or to receive registration materials for the East Aurora session, contact Sharon Bachman at 716-652-5400 x 150 or sin2@cornell.edu. For more information or to receive registration material for the Chautauqua session contact Ginny Carlborg, (716) 664-9502 x 202 or vec22@cornell.edu.

March 5-7, 2009; *Professional Farmers' Market Managers Training Workshop.* Stockade Inn, Schenectady, NY. For more information: <http://www.nyfarmersmarket.com/workshops.htm> or Email Diane at info@nyfarmersmarket.com, (315) 637-4690.

March 11-13, 2009 *Advanced Farmer to Farmer Workshop.* United Methodist Church; Corner Henning & 5th Avenue; Saratoga Springs, NY. For more info: <http://www.uvm.edu/vtvegandberry/meetings/farmertofarmer3-09.pdf> or Sandy Arnold/Ted Blomgren sparnold@capital.net 518-638-6501

March 12, 2009; *Regional Berry Pruning Work shop.* Grisamore Farms, Locke, NY. More information: Dan Welch, Cayuga County CCE, 315-255-1183 or dlw56@cornell.edu.

- March 14, 2009:** *Small Fruit IPM Scout Training – Session II.* Wyoming County CCE.
- March 16, 2009:** *Introduction to Berry Pest Management.* Ontario County CCE. Details follow below.
- March 17, 2009,** *Estate and Succession Planning* Massabesic Audubon Center, 26 Audubon Way, Auburn NH. \$25. For more info contact www.events.unh.edu/registrationForm.pm?event_id=5407.
- March 19, 2009:** *Regional Berry Pruning Work shop.* Columbia County CCE. More information: Steven McKay, Columbia County CCE, 518-828-3346 or sam44@cornell.edu.
- March 21, 2009,** *New Haampshire Vegetable & Berry Growers' Annual Meeting,* Alan's Restaurant, Boscawe NH. \$30, 1 pesticide credit. For more info contact George Hamilton at George.Hamilton@unh.edu.
- March 24, 2009.** *Soils for Farmers.* A workshop designed to help you enhance soil health on the farm in order to promote crop productivity and quality. Marlboro College Technology Center, Brattleboro, VT. For more info: <http://www.uvm.edu/vtvegandberry/meetings/SoilsForFarmers3-24-09.pdf> or
- March 25, 2009:** *Regional Berry Pruning Work shop* Jefferson County CCE. More information: Sue Gwise, Jefferson County CCE, 315- 788-8450 or sgj42@cornell.edu.
- March 26, 2009:** *Regional Berry Pruning Work shop* Livingston County CCE. .More information: David Thorp, Livingston County CCE, 585-658-3250 ext 109 or dlt8@cornell.edu.
- March 31, 2009.** *Maine Vegetable & Fruit School,* BANGOR MOTOR INN, 701 Hogan Road, Bangor, Maine, 207-947-0355 or 1-800-244-0355, Directions: www.bangormotorinn.com \$30 registration, 3 pesticide credits. For more info go to <http://www.uvm.edu/vtvegandberry/meetings/Maine%20Fruit&Veg%20School09.pdf>
- April 1, 2009.** *Maine Vegetable & Fruit School,* KEELEY'S BANQUET CENTER, 178 Warren Avenue, Portland, Maine, 207-797-3550 or 1-800-439-3550, Directions: www.keeleythekaterer.com, \$30 registration, 3 pesticide credits. For more info go to www.uvm.edu/vtvegandberry/meetings/Maine%20Fruit&Veg%20School09.pdf
- April 6, 2009:** *Regional Berry Pruning Work shop* Delaware County CCE. More information: Janet Aldrich, Delaware County CCE, 607- 865-6531, or jla14@cornell.edu.
- April 20, 2009:** *Small Fruit IPM Scout Training – Session III.* Green Acres Farm, Rochester, NY.
- May 12, 2009:** *Small Fruit IPM Scout Training – Session IV.* Green Acres Farm, Rochester, NY.

Massachusetts Berry Notes is a publication of the University of Massachusetts Extension Fruit Program, which provides research based information on integrated management of soils, crops, pests and marketing on Massachusetts Farms. No product endorsements of products mentioned in this newsletter over like products are intended or implied. UMass Extension is an equal opportunity provider and employer, United States Department of Agriculture cooperating. Contact your local Extension office for information on disability accommodations or the UMass Extension Director if you have complaints related to discrimination, 413-545-4800.