



Berry Notes

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Prepared by the University of Massachusetts Fruit Team

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Message from the Editor:

Pruning: The early spring (late winter) is the best time for pruning fruit trees, vines and bushes. Pruning should take place while the plants are in dormancy and also at a time when the danger of damaging winter temperatures is past. Snow cover may hinder access to plants and it may be best to wait until most of the snow cover has thawed so that cuts can be made to the base of the plants. This issue of Berry Notes is dedicated to the topic of pruning.

UMass Cold Spring Orchard Research & Education Center: For those of you who might not know, UMass has a research and education facility for fruit production in Belchertown, MA. While focusing primarily on tree fruit production, (there are over 100 varieties of apples alone!) the Cold Spring Orchard had been integrating more and more small fruits into their operation in the last few years. For example, in 2002 we established a new demonstration vineyard with 14 varieties of hardy seedless table grapes. We have plans to renovate and expand a blueberry planting. Other plantings are in the planning stages. As many of our fruit orchards are looking for opportunities to expand their crop base and market opportunities, the Cold Spring Orchard is providing a much needed testing ground for these crops. Check it out at: <http://www.coldspringorchard.com/>.

New Location for the New England Vegetable and Berry Growers Conference:

Mark your calendars for next winter's NEVBGA Conference and Trade Show which will combine with the New England Fruit Meetings at a new location, the Center of New Hampshire Holiday Inn in Manchester New Hampshire on December 16, 17 and 18, 2003, (<http://www.massfruitgrowers.org/nefrmtg/nevbc-nefm--12-2003.pdf>). Plan to join us at this exciting new (convenient) location with its expanded facilities for a great learning and networking opportunity. Mark your calendars. More information will be provided in the coming months.

Strawberries

Organic Strawberry Production Systems

Marvin Pritts, Cornell University and Joe Kovach, Ohio State University

Demand for organically grown produce has been increasing significantly over the past decade as the public often perceives organic produce to be healthier than conventional fruits and vegetables. Although no data exist to support this belief, a portion of consumers is willing to pay extra for organics. Tomatoes, sweet corn, lettuce, onions, carrots, melons and strawberries already are produced by organic growers in significant quantities.

Can strawberries be grown organically for a profit? Organic strawberry systems have 5 characteristics in common, regardless of the location in which they are grown: 1) Several years between successive crops; 2)

Short production cycle (1-2 fruiting years); 3) High labor requirements; 4) Lower yields; and 5) Greater variability in yields. All of these characteristics result in a greater expense for the organic grower than the conventional grower, but if the price of berries is higher, then production can be profitable.

For example, organic and conventional annual strawberry production systems were examined in California over a three year period (Table 1). Both systems cost a similar amount to establish (\$22,000/acre-year), and the organic system yielded less (27,100 vs. 40,200 lb/A), but the organic system averaged a higher return because the price received for fruit was 50% higher (Calif. Ag. 50:24-31).

Table 1. Characteristics of two production systems in California after three years.

Organic	Conventional
More insect pests	Fewer insect pests
More insect predators	Fewer insect predators
More harmless nematodes	Fewer harmless nematodes
Decreasing soil organic matter	Decreasing soil organic matter
Smaller plants	Larger plants
Lower yields	Higher yields

In an attempt to determine the costs of production and breakeven price for organic matted row strawberries, a comprehensive spreadsheet developed by Alison DeMarree (Cornell Cooperative Extension) and Regina Rieckenberg (Valent USA) was used to calculate production costs and profit for matted row strawberries, and the assumptions were changed to conform to organic production. For example, any costs for synthetic inputs such as fertilizers and pesticides were eliminated, but yields were reduced by 30 - 70% as well - with the greatest decrease in later years. For example, in fruiting years 1 - 4, conventional yields were set at 7,000, 7,000, 4,000 and 3,000 qts/A, whereas organic yields were set at 5,000, 4,000, 2,000 and 1,000 qts/A. 104 hours of labor we assigned to weed the organic fields, but only 52 hours per year to weed the conventional fields. All fruit was hand harvested for sale. Conventional prices were set at \$1.75/qt. Organic prices were set at \$2.00, although significantly higher prices can be obtained at urban markets (up to \$3.50/qt.).

The breakeven price for the conventional system was \$1.10/qt., whereas the breakeven price for the organic strawberries was 34% higher at \$1.47/qt. By the 4th bearing year, however, organic strawberries were losing money. This supports the practice of many organic growers of fruiting their fields for only 2 years. If fields are rotated out of strawberries after 2 fruiting years, then a positive cash balance is obtained.

The enterprise budget for organic strawberries does not include the costs of a fallow period between cropping cycles, which is a real expense for organic growers. On the other hand, the fixed costs of both systems were set at equivalent values, even though an organic grower is likely to have less equipment (e.g. herbicide sprayer). Regardless of the details of the budget, one can conclude generally that organic strawberry production can be as profitable as conventional production if the price differential for fruit approaches 35 - 40%. This is consistent with the price differential required in the annual production system as well. The size of the market for \$2.40/qt. berries is limited in many regions of North

America, but not all. Therefore, a profit opportunity does exist for organic strawberries in certain marketing niches.

Organic production systems of the future - New techniques of nutrient and pest management are under development that could be used by organic strawberry growers to enhance their production and improve soil quality.

Use of specialized rotational cover crops - Planting berries through strips in a rye residue can enhance weed control in lighter soils. Recent work with marigolds, sudangrass, brassicas, and certain native prairie species (e.g. *Rudbeckia*) have found them to be suppressive to nematodes, pathogens and weeds. Certain of these may be particularly suited for rotations with strawberries, but might be too expensive for lower-value crops.

Use of interplanted cover crops - Interseeding oats and sudangrass between rows after harvest can supplement weed control, help improve soil structure, and improve winter mulching practices.

Use of entomopathogenic nematodes and fungi to manage insect pests - Special strains of nematodes are being developed that will attack grubs and weevil larvae in strawberry fields. Similarly, pathogens of insect pests are being developed and tested in strawberry fields. Once robust delivery methods are identified, then the use of these organisms will become routine.

Use of parasites/parasites to manage insect pests - Parasites of tarnished plant bug and sap beetle have already been tested in strawberry fields. The use of

predatory mites is routine in some areas of Florida and California where the climate is mild. Development of hardy, adapted predators is a next step in achieving acceptable control. The techniques of molecular biology are being used to improve the adaptation of predatory mites in Florida.

A better understanding of thresholds - Strawberries appear to be able to tolerate more weed pressure in late August and September than earlier in the season. Also, recent work has suggested that strawberry plants can compensate for clipper injury by increasing the size of remaining fruit, indicating that for most growers in most years, strawberry clippers are not economically important pests. Improved scouting techniques, such as the use of white pan samples rather than sticky cards, have enabled growers to identify more precisely when tarnished plant bug damage actually occurs. This knowledge allows organic growers to make better management decisions.

Improvements in varieties - Many of the new strawberry varieties are resistant to several races of red stele and verticillium wilt, show tolerance to nematode feeding, and resist gray mold infection. Some show tolerance to feeding by tarnished plant bugs, and certain selections appear to be tolerant to black root rot. Most of these newer varieties have improved postharvest qualities, yet have maintained a high degree of flavor.

Use of analytical techniques to monitor nutrition - Soil and leaf testing services are available and being refined to enable organic growers to determine if nutrient levels are adequate, and to monitor long-term trends in soil fertility. (*Source: The New York Berry News, Vol. 02, No. 01, January 22, 2003*)

Organic / Conventional Strawberries Equally Tasty, Survey Finds

Joe Kovach, Ohio State University, written by Candace Pollock, OSU Communications

Do organic foods really taste better than their conventionally grown counterparts? According to an Ohio State University Extension survey, when it comes to strawberries, consumers can't tell the difference. The survey, in its first year of evaluations, found that based on looks, taste, and smell, consumers could not tell the difference between organically grown and conventionally grown strawberries within the same variety. Research has shown, however, that consumers can make the distinction between varieties and when other conditions are factored in, such as the length of time a product sits at the market.

"When testing within a strawberry variety, we found no consumer detectable differences between organic and conventional," said Joe Kovach, an Ohio State Extension entomologist who participated in the research. "When

people say organic tastes better, it's because of things like distance to market or a different variety."

Organic production, in its simplest terms, means that a crop is grown without the use of synthetic fertilizers or growth regulators and is managed through traditional practices such as composting, crop rotation, and tillage. Other studies have reported that organic foods taste better than conventionally grown products, mainly due to the cultivation practices and the lack of fertilizers, insecticides, and fungicides that are applied to the crop.

In the Ohio State study, researchers grew the strawberries using the matted row system and applied livestock manure to the organic strawberries and synthetic fertilizers to the conventional strawberries. Kovach said the survey results

shed light on how a crop is grown, how it is harvested, stored and processed, and even what markets it is shipped to.

“The bottom line is people can’t tell the difference in nutrient uptake whether it comes from a synthetic fertilizer or a compost. But they can tell how long something’s been sitting on a shelf,” said Kovach. “When you go into a grocery store, you’re going to pick up a fruit or vegetable that is home-grown, rather than something from California. Something closer to home is fresher and tastes better than a crop that was shipped halfway across the country and has been sitting in a store for days.” He said the data is intended to aid Ohio growers in improving the production and marketing of organic crops.

The researchers used ‘Seneca’, ‘Jewel’ and ‘Idea,’ more commonly grown strawberry varieties in Ohio, for the survey. They harvested the same-sized berries in the same fields at the same time and asked a panel of 24

taste testers to identify which berries were organic and which ones were conventionally grown.

Kovach said the survey involved a triangle test, whereby participants were given three strawberries: two that were organic, one that was conventional or vice versa. “We didn’t ask them to pick which one was organic and which one was conventional. We asked them to pick the one that was different, either in taste, smell or appearance. So it was a blind study,” said Kovach. “If participants were able to tell the difference or took a guess, they would mark the one that was different. Analysis showed they really couldn’t tell the difference between organic and conventional.”

The researchers plan to conduct another survey this year and will incorporate other composts, like vermi-compost and yard waste into the study to determine if consumers can detect differences between them. They will also conduct chemical analyses among strawberry varieties to determine if chemical differences might enable some consumers to detect the difference between organic and conventional crops. (*Source: Ohio Fruit ICM News, Volume 7, Issue 3, January 30, 2003*)

New Strawberry Cultivar for Trial in Ohio

Richard C. Funt, Ohio State University

A new strawberry cultivar for trial by Ohio growers has been released by the USDA. ‘Ovation’ (Lateglow x Etna) is a red stele resistant, late season strawberry. It has large, firm berries and good flavor. In 2001-2002, ‘Ovation’ was tested by OSU faculty at two locations as B440. Plug plants were set 12 inches apart in August 2001 on raised beds with black plastic and micro-irrigation. Fruits were harvested, weighed, and compared to standard cultivars in a non-replicated trial.

‘Ovation’ is later and larger in berry size than ‘Allstar’ (Funt, 2002). On June 11, south of Columbus, OH, 74% of ‘Allstar’ had been harvested, but only 23% of ‘Ovation’ had been. Most of ‘Ovation’ was harvested by June 19th. Allstar averaged 12.7 grams, while ‘Ovation’ averaged 15.0 grams per berry for the entire season. ‘Ovation’ produced nearly 75% and 94% of ‘Allstar’ in locations tested.

‘Ovation’ is a tall, vigorous plant with a large amount of foliage. On rich, high organic matter fields, ‘Ovation’ needs to be planted at 18 inches. If managed with high rates of nitrogen and planted closer than 18 inches, fruits

will be poorly colored and low in flavor. Sunlight is necessary for good color, berry shape, and flavor. Also, it appears that ‘Ovation’ could be planted at 12 inches on sandy soil having 0.5 to 1.5% organic matter in August in northern Ohio. This berry has good marketability for pick-your-own, farm markets, or roadside markets because of its size, firmness, and flavor when proper cultural practices are followed.

Further, when improper management occurs, leaves remain moist during early morning and leaf diseases could be an issue, even with good fungal sprays. This cultivar appears

to be suitable for plasticulture systems, particularly if two harvest seasons can be obtained. Future testing by OSU personnel and growers in 2003 should provide additional information regarding the needs of this cultivar to match its major qualities. (*Source: Funt, R.C. 2002. Strawberry cultivar; performance and evaluation 2002. Ohio State University, Department of Horticulture and Crop Science. (unpublished) via Ohio Fruit ICM News, Volume 7, Issue 3, January 30, 2003*).

Brambles

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.

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:

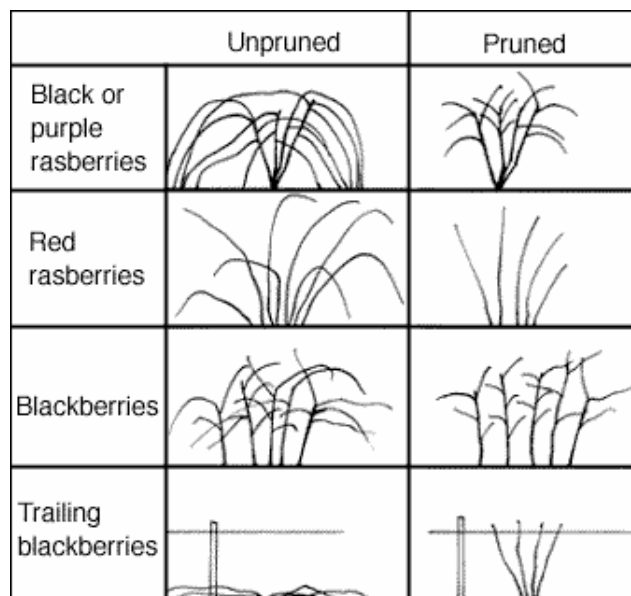
1. Tipping the new canes at a height of 24 to 30 inches to form branched canes.
2. As growth starts, remove all dead and weak canes or branches and head the branches back to a length of 12 to 15 inches or to the degree that the canes can support the expected crop.
3. After the crop is harvested, remove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

Figure 1. Pruned and unpruned raspberries and blackberries

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.

- 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.
- 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.

- 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>*)

Bramble Variety Testing in SW Michigan

Eric Hanson, Annemeike Schilder, Steve Berkheimer, Michigan State University

This trial was planted on a loamy sand soil at South West Michigan Research station in 1999 to evaluate 7 fall-bearing varieties, and 15 summer-fruited raspberries in replicated plots. Fall fruiting varieties were evaluated from 2000 to 2002, and summer bearing raspberries will be harvested from 2001-2003. Plots are picked for yield and

average berry weight, and half-pint samples are assessed for appearance and percent rotten fruit after 1-2 days at 35° F and 1-2 days at 65° F. Winter injury to summer bearing varieties was assessed by measuring the length of die-back on 20 canes per plot each May.

Table 1: Primocane Fruiting Raspberry performance at SWMREC. Data are means of three seasons (2000-2002).

Variety	Yield (1000 lb/ac)	g per berry	^z appearance	^z % rotten berries	1st picking date	Height (feet)
Autumn Bliss	4.6	2.7	2.5	18	6 Aug	4.1
Autumn Britten	2.2	2.7	2.6	33	6 Aug	3.9
Caroline	5.4	2.6	3.4	6	17 Aug	4.0
Dinkum	3.8	2.4	3.0	15	15 Aug	3.7
Heritage	3.5	2.0	3.1	7	24 Aug	4.3
Polana	3.3	2.1	3.1	17	6 Aug	3.2
Ruby	3.5	2.7	2.7	22	26 Aug	4.6

^zAppearance rated on a scale of 1 (very unattractive) to 5 (very attractive) and rotten fruit counted after 1-4 days storage. Polana data from 2000 were means of only 2 plots because one plot was planted in 2000.

Table 2: Summer fruiting raspberry performance at SWMREC. Data are means of two seasons (2001, 2002).

Variety (origin)	Yield (1000 lb/ac)	g per berry	1st picking	Cane height (ft)	Winter kill (inch/cane)
Boyne (Manitoba)	4.9	2.0	27 Jun	4.8	2
Canby USDA (Oregon)	4.2	2.0	29 Jun	4.8	3
Encore (N.Y.)	3.0	2.9	4 Jul	4.0	1
Glen Ample (U.K)	2.9	3.1	3 Jul	4.5	1
Killarney (Manitoba)	5.8	2.2	27 Jun	4.1	0
Latham (Minnesota)	3.2	2.0	4 Jul	5.3	1
Lauren (USDA)	1.6	1.9	1 Jul	5.0	6
Malahat (B.C)	2.0	2.5	1 Jul	4.2	10
Nova (N.S.)	3.7	2.3	24 Jun	4.6	1
Prelude (N.Y.)	4.1	1.9	23 Jun	4.4	0
Qualicum (B.C.)	2.1	2.5	7 Jul	4.1	4
Reveille (USDA)	5.7	2.5	25 Jun	4.5	1
Titan (N.Y)	2.6	2.9	1 Jul	4.3	3
Tulameen (B.C)	1.8	2.7	8 Jul	3.7	15
K81-6 (N.S)	3.7	3.0	5 Jul	4.0	2

Editor's notes:

Raspberry varieties originating in B.C and USDA, are often not winter hardy in most of Ontario.

Blackberries were also included in this trial, but space does not permit publication here. For a full copy of this report contact the OMAF Agricultural Information Contact Center at 1-877-424-1300

For information on raspberry variety trials in Ontario, see John Zandstra's reports at <http://www.ridgetownc.on.ca/Research/subject/raspberries.cfm>.

See also Recommended Raspberry Varieties For Ontario at <http://www.gov.on.ca/OMAF/english/crops/facts/berryrec.htm> and their descriptions, Notes on Raspberry Varieties Recommended for Ontario at <http://www.gov.on.ca/OMAF/english/crops/facts/rasparc.htm>. (*Source: The All Ontario Berry Grower, Volume #0.01, January 2003*)

Blueberries

Principles of Pruning the Highbush Blueberry

Bill Cline and Gina Fernandez, NC State University

Effect on Plant Size and Crop Yield

Pruning a plant reduces its ultimate adult size and the crop yield in at least the following season. To compensate for this loss of bearing area and yield, other factors, largely economic, must be considered in planning a pruning program.

Effect on Fruit Size

By reducing the number of fruit buds (and hence clusters) on the bush, pruning results in an increase in the size of the individual berries. Up to a point, the more severe the pruning, the larger the remaining berries are. Pruning for increased size is a compromise between desired size and yield (numbers) of fruit.

Effect on Ripening Period

Moderate to heavy pruning tends to shift the ripening period forward so that most of the remaining fruit ripens together and early. Light pruning results in a longer season of ripening. It may be more profitable in southeastern NC to prune fairly heavily, even at the expense of some yield, to realize the earliest possible maturity.

Effect on Plant Growth and Vigor

Pruning results in longer and more vigorous (thicker) shoot growth in the next season. Heavy pruning causes thicker and more leafy shoots than light pruning. The thicker and later-developing shoots tend to produce fewer fruit buds than those which stop growing earlier in the season. Fruit of the blueberry is borne on wood produced in the previous season (one-year-old wood). By pruning, you are regulating the fruiting potential of next season's crop. Pruning should be severe enough to invigorate the plant so that sufficient new wood is produced during the following season. You are actually determining the fruiting potential of the crop of two seasons hence by the number and type of cuts you make this winter.

Spacing the Crop on the Bush

By wise selection of canes and lateral shoots on those canes which will bear the crop, the grower can prune to have his fruit well-distributed on the plant. Well-distributed clusters should have enough leaves around them to provide adequate foodstuffs, but not enough to overshadow the fruit, or to reduce spray or dust coverage, or to make the clusters hard to reach during harvest.

Bush Life and Productive Life

Blueberry bushes tend to overbear, which shortens their lives. By pruning to regulate crop load, the grower can

lengthen the life of his bushes and increase the number of commercial crops.

When to Prune

Blueberries should be pruned during the winter while the bushes are dormant. In winter, flower buds are easily visible on one-year-old wood and their numbers can be adjusted by pruning to regulate the crop load for the coming year.

Tools Needed

Most blueberries are hand pruned using long-handled pruning loppers capable of cutting branches 2 to 3 inches in diameter. Finer, more detailed pruning such as thinning of flower buds on individual fruiting twigs requires smaller, one-hand pruners. For larger plantings, pneumatic pruners are available, but these tools require an air compressor and are fairly expensive.

Training Young Plants (1 to 3 or 4 Years of Age)

If vigorous, well-rooted two-year-old plants are set, they do not need cutting back the first year in the field except to remove fruit buds shortly after planting. Pruning should be moderately heavy in the second year in the field to stimulate strong new growth on selected canes. Do not permit plants younger than three years of age to bear more than a cluster or two of fruit, or the onset of the commercially productive period will be delayed. A large bearing area should be established in the shortest possible time.

Pruning Bearing Plants (over 3 to 4 years of age)

1. Make large "shaping cuts" — Remove all low-spreading branches and the oldest canes if they are weak, particularly if in the center of the plant. "Head back" the upright "bull shoots" to the desired height to keep the bush from growing too tall. Essentially, you have then automatically selected the remaining, more upright canes to bear your crop next season and the following season.
2. On the remaining canes, systematically "thin out" the shorter, thinner shoots, leaving enough of the thick shoots to bear the crop and make new growth. Only experience can tell you how many shoots a particular variety of a particular age can carry and still perform well. It is probably better in most instances to prune too lightly than too heavily. Lighter pruning is usually practiced as the plant grows older because it can carry more "wood" successfully due to a larger root system.

- Finally, some varieties such as 'Murphy' and 'Morrow' should have their fruiting shoots cut back to 3 to 4 fruit buds per shoot. This is done principally to insure adequate fruit size.

Renewal Pruning

When blueberries are about 8 to 10 years old, they are at their productive peak, but renewal growth has reached a minimum, and production will then decline markedly from year to year. Some provision must be made to revitalize the plant to prolong its productive period. Weak or badly diseased canes should be removed entirely. These canes can be identified by generally poor vigor and low fruit bud

production. However, eastern NC many varieties do not sprout new canes readily from the crown. It may be

necessary to either cut the cane back to a strong lateral which is properly located, or to cut the cane severely ("dehorn") back to within 2 to 3 ft of the ground. By the latter method, it is hoped that new lateral branches can be forced from below the cut.

Either method may result in a 1- to 3-year crop reduction, but the plants should then bear several more good crops. However, when rejuvenation becomes necessary, it is well to start considering newer and better varieties to which your acreage may be systematically replanted in the near future. (Source: NC State Horticulture Information Leaflet HIL-201-B, 1998)

Pruning Highbush Blueberries

David Handley, University of Maine

Blueberry bushes should be pruned every year to produce high yields of good quality fruit. Prune the plants when they are fully dormant during the late winter or early spring (January–March). For the first two years after planting, simply remove any dead branches and all weak, spindly growth. For plants that have been established for three years or more, follow these steps:

- Prune out any weak, low-growing or diseased canes.
- Prune out all canes that are over six years old (these are usually the thickest canes, which are gray in color with peeling bark). Blueberry canes tend to be less productive once they get more than six years old and should be pruned out in favor of younger, more productive canes. Cut the old canes back to ground level unless new cane growth has been sparse; in which case, leave a four- to eight-inch stub above the ground. New canes may sprout from these stubs.
- Thin the remaining canes, leaving those with the most vigorous shoot growth (long, thick branches with good fruit buds). Leave six to seven vigorous two- to five-year-old canes and two or three one-year-old canes per bush. A mature blueberry plant should have six to 10 healthy canes varying in age from one to six years old.
- Remove any weak fruiting branches on the remaining canes, especially those under six inches in length. Most fruit is produced on vigorous one-year-old shoots on healthy two- to five-year-old canes. The

fruit buds on these shoots are large and teardrop-shaped. Each bud will produce a cluster of five to eight flowers. The shoots also have smaller, pointed buds that will produce leaves.

(Source: University of Maine Cooperative Extension Bulletin #2253, "Growing Highbush Blueberries", available online at

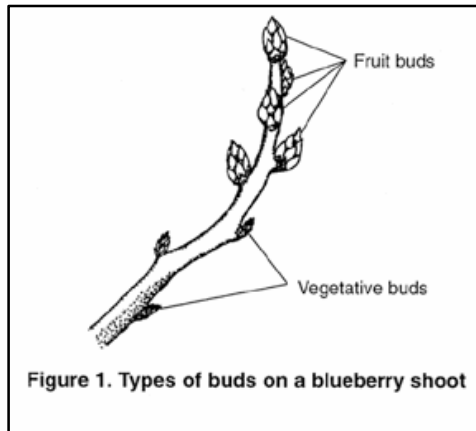


Figure 1. Types of buds on a blueberry shoot

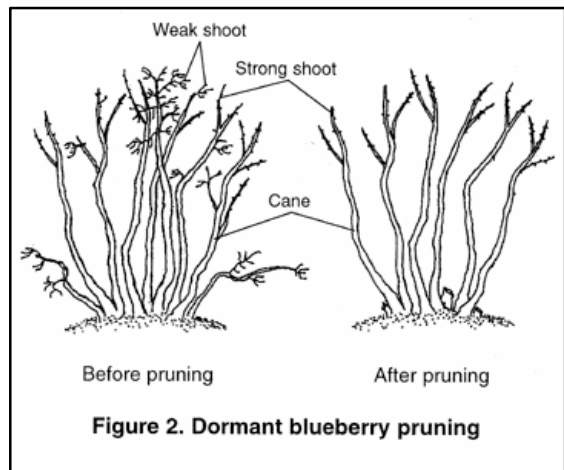


Figure 2. Dormant blueberry pruning

<http://www.umext.maine.edu/onlinepubs/htmpubs/2253.htm>

Grapes

Balance Pruning Grapevines

Mark Chien, PennState 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. It's 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. It's 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 your 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 1940'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. 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)

Currants 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 fan-shaped 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://eesc.orst.edu/agcomwebfile/edmat/html/ec/ec1361/ec1361.html>*)

Meetings

New England Farmers' Direct Marketing Conference slated for March 12-13

Change, Challenge and Collaboration is the theme of the 2003 New England Farmers' Direct Marketing Conference, which will be held March 12-13 at the Holiday Inn Boxborough Woods, Boxborough, Mass. The conference will help conference attendees embrace change, overcome challenges and succeed through collaboration with their fellow farm direct marketers and others not in the industry.

Two featured speakers, Pete Lockett and Jim Cain, will each give a full-day workshop on March 12. Lockett is also the keynote speaker on March 13. Cain will speak during the day's closing session.

Lockett, of Bedford, Nova Scotia, is known to many people as The Food Hunter because of his popular TV show on The Food Network. He owns Pete's Frootique, an 18,000-square-foot market that features towering displays of produce and innovative merchandising techniques. From Don the Doorman to Steve the pianist, shoppers are never bored when shopping at Pete's Frootique. Lockett is one of Canada's leading independent green grocers. His workshop is titled "Creating the WOW—Every Day!" Attendees will leave with ideas on how to create unforgettable consumer experiences at their farms via innovative branding, team building, effective displays, power merchandising and customer service. They'll learn how their farms can OUT-WOW the chain stores.

Cain, of Brockport, N.Y., has taught adventure-based teambuilding for more than 25 years. His workshop, "A day of teamwork and teamplay," will probably change the lives of all who attend. He'll help attendees transform their employee hiring and training practices, build a

"working community" with their staffs, and collaborate successfully with others in the community.

The workshops are \$85 per person if pre-registered by March 3. Late or on-site registration will be \$100. Conference registration is \$75 (\$95 if late or on-site). Registration includes the full day of the conference on March 13, coffee hour, lunch, an evening social and the conference Advisory Group Meeting. For registration information, call (413) 529-9100, e-mail info@massfarmstands.com, or visit www.newenglandconference.com.

The conference sessions are "Step 1: Collaborating with those who sell New England," "Step 2: Selling your farm by selling New England," "What flew & what flopped," and "Understanding the media: A panel discussion." The day will conclude with Jim Cain's general session, "Collaboration, Competition, Change and the Future." The conference is organized by White Loaf Ridge Management and is the official conference of the Massachusetts Association of Roadside Stands and Pick-Your-Own. This year, it collaborated with the Northeast Farm Communicators Association (NEFC). Members of NEFC will participate during the media panel discussion. It is also offering a special session called "Interviewing: What to say when the media calls." It's a chance for farmers to network with the agricultural media, and it's a chance for them to practice their interviewing skills. The session will be led by B.J. Roche, of Charlemont, Mass. She teaches newswriting and reporting at the University of Massachusetts-Amherst. She's also a freelance writer and

newsletter editor and is a regular writer for the Boston Globe Sunday Magazine.

Conference attendees will also have a chance to shape the future of the conference by attending the NEFDMC Social &

Advisory Group Meeting. The goal is for New England's farm direct marketing community to come together and brainstorm ideas for future speakers and topics.

Finally, the conference will be capped by a joint NEFDMC and NEFC banquet. Winning entries in the NEFC Northeastern communications competition will

be on display. The evening's featured speaker will be Charlie Touchette, executive director of the North American Farmers' Direct Marketing Conference. Banquet tickets are \$35 each.

For more information: Kelly Fuerstenberg, 413/529-9232

Plant Preview Days

April 8, 15, 22 8:30 AM – 4:00 PM

“Tuesdays in April are Tour Days”

at these participating family owned, wholesale greenhouses in Massachusetts

D&D Farms, Inc., Stow
J.P. Bartlett Co., Inc., Sudbury
Mahoney's Growing Division, Woburn
J. Gilson Greenhouses, Inc., Groton
King Farm, Inc., Townsend
The Flower Hutch, Townsend
Oak Hill Greenhouses, Spencer

Sposato Wholesale Greenhouse, Inc., Worcester
Kunan's Greenhouses, Inc., Holbrook
R.F. Morse Greenhouse & Nursery, West Wareham
Fairview Farms, Inc., Whately
FAF Growers, Northfield
Pioneer Gardens Inc., Deerfield
Atypical Farm, Norton

Looking for sources of spring plants? Take a peak at this season's spectacular crop of flowers on Plant Preview Days. Garden center operators, farm stands, landscapers, chain store buyers, plant brokers/salesman, municipalities, sellers of plants for fund-raisers and other industry buyers are invited to visit participating family owned, wholesale greenhouses on Tuesdays in April.

The goal is to connect plant buyers with wholesale plant growers in Massachusetts to help keep agriculture viable in the Massachusetts. Fourteen participating wholesale greenhouses throughout Massachusetts will open their greenhouses for viewing on Tuesday April 8, 15 and 22nd. Participating wholesale growers specialize in a wide assortment of products for spring, including annuals in packs and pots, perennials, hanging baskets, patio planters, herbs, ornamental grasses, geraniums and more.

For more information and to receive directions to participating greenhouses, contact: Tina Smith 413-545-5306 or Paul Lopes 508-295-2212 x 24, University of Massachusetts Extension Floriculture Program Plant Preview Days is co-sponsored by University of Massachusetts Extension and the Massachusetts Flower Growers' Association.

February 18-19 ONTARIO FRUIT & VEGETABLE CONVENTION

Brock University, St Catharines.

Contacts: Chairman: Tony Sgambelluri 905-945-1713

February 20-22 VITICULTURE 2003

Buffalo Convention center, Buffalo, NY.

Contact: info@viticulture2003.org for more information

March 12-13 3rd ANNUAL NEW ENGLAND FARMERS' DIRECT MARKETING CONF. & TRADE SHOW

Holiday Inn Boxborough Woods, Boxborough, Mass.

Contact: Charlie Touchette, 413-529-9100, or e-mail info@massfarmstands.com

March 27 GROWING RASPBERRIES IN GREENHOUSES

Simcoe, Ontario, Canada

Speakers include: Adam Dale, Marvin Pritts, Doug Balsillie, Glenn Fox and Tom Wood. Doug Balsillie and Tom Wood are among the largest greenhouse raspberry growers in North America.

From more information: Department of Plant Agriculture, 1283 Blueline Road. Phone: 519-426-7127 ext. 333 or email adale@uoguelph.ca. Or you may contact Max Welcome (mw45) for a brochure.

April 1 - AGRICULTURE DAY AT THE STATE HOUSE.

Mary Jordan, 617-626-1750, Mary.Jordan@state.ma.us.