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Berry Notes

Prepared by the University of Massachusetts Fruit Team

February 2013 Vol. 25, No. 2

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UPCOMING MEETINGS

2013-14 New England Small Fruit Pest Management Guide – The 2013 edition of the NE Small Fruit Guide is going to press soon. You can view it online at <http://extension.umass.edu/fruitadvisor/ne-small-fruit-management-guide>. See announcement soon for how to get print versions in your state.

USDA/FSA Microloans: Microloans are direct farm operating loans with a shortened application process and reduced paperwork, designed to meet the needs of smaller, non-traditional, and niche-type operations. Microloans can be used for all approved operating expenses as authorized by the FSA Operating Loan Program. The maximum loan amount for a microloan is \$35,000. Additional information on the USDA Farm Service Agency Microloan program may be obtained at local FSA offices. Click [here](#) for more information.

2013 Organic Certification Cost Share Program: Are You a Farmer or Rancher in One of These States? *Connecticut, Delaware, Hawaii, Maine, Maryland, Massachusetts, Nevada, New Jersey, New Hampshire, New York, Pennsylvania, Rhode Island, Utah, Vermont, West Virginia, Wyoming.* If so, you are eligible to receive a 2013 organic certification cost share reimbursement!

Amount of Reimbursement - Organic crop and live-stock producers in the states listed above can be reimbursed as much as 75 percent of their certification costs from October 1, 2012 through September 30, 2013, up to a maximum of \$750. This program is not competitive; \$1.425 million is available for farmers and ranchers in the States listed above.

How to Get Reimbursed - Contact your State's department of agriculture (or its equivalent) for an application. Assemble the following supporting documentation: proof of USDA organic certification, itemized invoice showing expenses paid for certification, W-9 tax form, and anything else required by your State.

STRAWBERRY

Strawberry Mulch Touch-up

Bob Tritten, Michigan State University Extension

Now is a good time to make sure strawberries are covered uniformly. Over the last few weeks, strawberry growers have asked me about the idea of redistributing the straw mulch used to cover strawberries during the winter. During winter, winds frequently remove straw mulch off of rows growing on the edges of fields, on hillsides and in other areas of fields where too little straw was placed last fall. Over the years I have responded to this question stating that it is important to inspect strawberry fields at this time of winter and to recover those areas where straw mulch may have blown off.

The reason it is useful to recover these areas is that it helps to create a field that will be much more uniform in berry ripening this summer during harvest. Most frequently, areas where mulch has been removed in winter begin to grow earlier in spring and ripen earlier

during harvest. It has also been my observation that the yield will also be reduced in these same areas and that berry size and quality will be reduced. Most often this recovering can be accomplished quickly by walking fields and using a pitch fork to move mulch around.

While it is hard to point to research findings on this topic, it is well known that when strawberries are covered well with mulch over the winter that they will survive the effects of winter much better and will lead to improved yields the following growing season. (**Source:** MSU Fruit Crop Advisory Team Alert, Feb 1, 2012)

Winter Freeze Injury to Strawberry Crowns

Sonia Schloemann, UMass Extension

Strawberries are susceptible to winter injury in two primary ways. The first is damage to roots from the heaving of soil that can result from cycles of freezing and thawing in the spring. This heaving action can snap roots and lead to problems with root infections in the wounded tissue. The other way in which strawberries can suffer damage in the winter is from freezing of crown tissue.

The strawberry crown is actually a compressed stem structure with layers of vascular tissue that forms a cylinder with vascular tissue running spirally in two directions. (See Fig. 1.) Inside this lignified or woody vascular tissue is a fleshy pith that can easily be injured and turned brown by the formation of ice crystals at low temperatures. The critical temperatures will vary with the variety of strawberry.

Most of our Northern varieties can withstand crown temperatures of between 10 to 14°F. This is why mulching for winter protection is so important for this

crop. At these temperatures, not only is the pith damaged, predisposing the tissue to infection by various pathogens, but the vascular function of the outer layer of cambium tissue can prevent normal transport of water and nutrients in the plant.

Freezing injury is easily seen by cutting the crowns length wise and looking for damaged tissue. (Be aware that if left exposed to air for a while, this tissue will oxidize and turn brown like an apple when it is cut open.). Uninjured pith at the center is a creamy white when first cut. With slight injury to the crown, but not measurable in its effect on the plant, browning of the lower part of the pith occurs.

Moderate injury, seen as a deeper browning, will result in noticeable damage to the plant (i.e., general weakening, slow growth,

fewer blossoms and reduced yield), Lethal injury, where vascular tissue has been killed, will exhibit deep browning and blackening of the outer cambium and result in plant death.

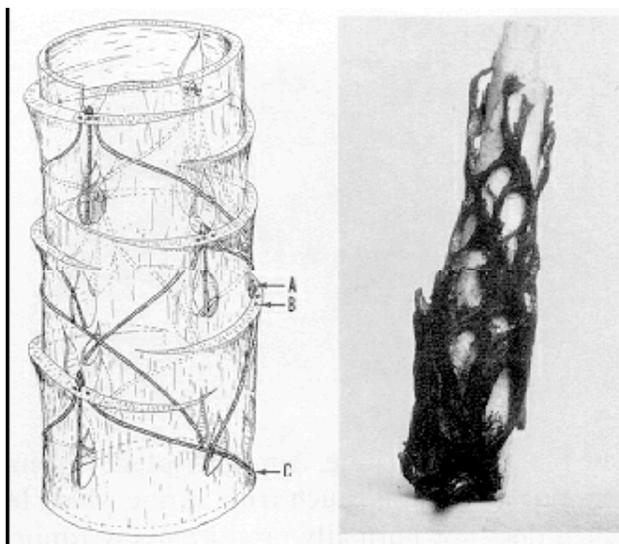


Figure 1. Morphology of the strawberry crown. (from G.M. Darrow. *The Strawberry: History, Breeding and Physiology*; <http://www.nal.usda.gov/pgdic/Strawberry/darpubs.htm>)

If you suspect winter damage in your strawberry field, go out and cut some crowns a week or two after the ground has thawed. If a high percentage of crowns show severe injury, it may be necessary to plow the field down and enter into a rotation cycle for a few years.

This will help purge the soil of high levels of pathogens that may build up on the decaying strawberry crowns. Low levels of damage can be nursed through to better health by judicious

irrigation, fertilization and other practices to keep plant stress low. See figures 2 and 3 below for help determining if your plants have winter injury or some other type of crown/root damage. (Reprinted from *Mass Berry Notes*, February 15, 2006 Vol. 18, No. 2)

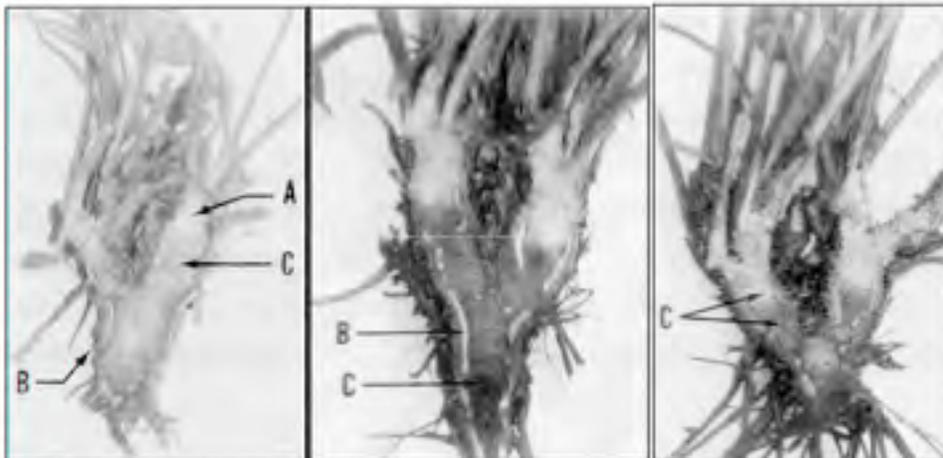


Fig 3. Cold injury to strawberry crowns. Uninjured crowns would have white centers at A. 1. The most serious injury occurs when the cambium that carries sap and food is killed. Slight recovery is shown by new cambium in 1 and 3 at B. Plant 2 would not have recovered. The darkening of the centers of the crowns (C) is caused by the formation of frost crystals that break through the cell walls and oxidation follows, as in the browning of sliced apples. (from G.M. Darrow, *The Strawberry: History, Breeding and Physiology*; <http://www.nal.usda.gov/pgdic/Strawberry/darpubs.htm>)

RASPBERRIES/BLACKBERRIES

Pruning Brambles

Sonia Schloemann, UMass Extension

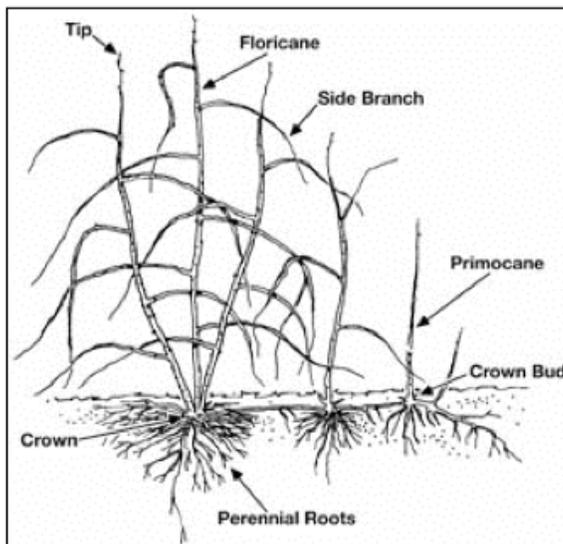
Introduction

Once established, raspberry plants require regular attention to keep them healthy and producing well. Weed and pest management are important aspects of maintaining a productive raspberry patch. Annual pruning is also a key activity for keeping raspberries productive.

Why is pruning important?

Brambles are plants with a biennial growth habit. This means that canes are produced in one year (called primocanes), overwinter, and then flower and fruit in the second year (then called floricanes). After floricanes fruit, they are no longer

needed by the plant and will die back. Removal of these spent floricanes is the first step in pruning brambles.



What are the steps to successfully prune raspberries?

Understanding of the goals of pruning will help guide how you prune your raspberries. The primary goal of is to generate optimal fruit production.

Raspberries produce fruit on floricanes (except fall-bearing types) so removing 'spent' floricanes after harvest and correctly managing primocanes results in productive plants. Secondly, you want to create good conditions for fruit

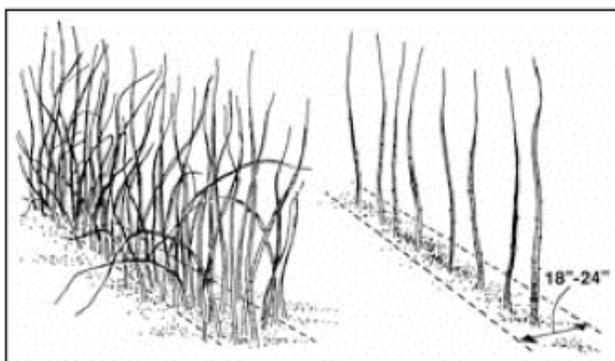
production and ripening. An open growth habit for raspberry rows allows for good air circulation and drying conditions which helps reduce the incidence of fruit rots. This also allows for sunlight penetration into the fruiting zone and promotes ripening and heightens flavor.

Types of Brambles:

Summer bearing types, including red, black, purple, yellow raspberries and blackberries all fruit on 2nd year canes.

Steps in pruning summer bearing raspberries:

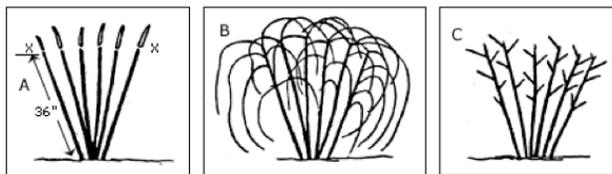
- 1) remove spent floricanes (fall – winter)
- 2) thin remaining primocanes to 6-8” apart, weed out spindly or broken canes, keep healthy robust canes (March)
- 3) re-establish 12-18” row width (March or later)
- 4) top remaining canes to 5” above top trellis wire (48 – 60”)



Steps in pruning blackberries:

- 1) tip primocanes in summer (A) to promote growth of laterals (B); leave at least 6” above top trellis wire (summer)

- 2) remove spent floricanes (fall – winter)
- 3) thin remaining canes to 5-10 canes per plant; remove spindly/damaged canes first (March)
- 4) head back laterals (C) to 6-8” (March)
- 5) adjust overall height of canes to 6” above top trellis wire (March)



Steps in pruning fall bearing raspberries:

- 1) mow all canes to 2 – 3” from the ground.

What are the tools used for pruning?

Hand tools such as loppers and hand pruners can be used for pruning raspberries. All tools should be sharp and clean at the outset. Select the appropriate tool to remove wood as cleanly as possible to avoid unnecessary injury to the plant. Leather gardening gloves are also recommended to prevent thorns from injuring or irritating bare hands.

Summary

Learning to master the art and science of pruning raspberries takes time and practice. Contact your University Extension Educator for updated information on pruning. Make sure your raspberries are pruned each year to keep them healthy and to maximize fruit production and increase the overall fruit quality.

Illustrations from PennState Small Scale Fruit Production Guide used by permission.

BLUEBERRY

Pruning Blueberries

Sonia Schloemann, UMass Extension

Why is pruning important?

Blueberry bushes that have not been pruned on an annual basis become overgrown in both height and branch density and as a result are less productive (Figure 1). Proper pruning of blueberries is key to maintain plant size, shape, and fruit production (Figure 2).

What are the steps to successfully prune a blueberry bush?

Understanding of the goals of pruning will help guide how you prune your blueberries. The primary goal of is to generate fruit production. Blueberries product fruit on ‘young’ wood so removing ‘old’ wood and continuously generating ‘young’ wood results in productive bushes. Secondly, you want to create good conditions for fruit production and ripening. An open growth habit for bushes

allows for good air circulation and drying conditions which helps reduce the incidence of fruit rots. Also, an open habit allows for sunlight penetration into the fruiting zone and promotes ripening and heightens flavor.

Are individual blueberry varieties pruned differently?

There may be slight variations in how certain varieties are pruned. Each variety may produce a different number of new canes each year; however, the overall plant structure is generally the same. Most high-bush blueberry varieties will respond similarly in terms of vegetative growth, fruit production, and quality of fruit following general pruning.

Can young blueberries be pruned the same as older, mature bushes?



Figure 1. Blueberry bush before pruning.

Young bushes generally require less pruning to remove undesirable growth. Mature bushes normally require more selective cuts to maintain a desired shape, plant structure, and productive fruiting wood. The key to pruning young plants is to focus on setting up the overall plant structure that will make the bush fruitful for several years. Bushes that are seven years old and older will need to have a few mature canes removed to maintain a balance between older canes that are becoming less productive and young canes that are not quite into full production.

How to approach a blueberry bush when pruning:

- 1) Visually size-up the blueberry bush from all sides and imagine what the plant should look like when pruning is completed.
- 2) First remove all diseased and broken canes or ones growing too low to the ground.
- 3) Next, canes that are eight years old or older should be removed.
- 4) Remove all but the 2-4 most robust new canes produced the previous year.
- 5) Ultimately, the bush should be:
 - a) narrow at base,
 - b) open in the center, and
 - c) have a balance of multi-age canes throughout the bush.

How should older, overgrown blueberry bushes be pruned?

Blueberry bushes should be rejuvenated to improve fruit production and maintain proper shape. This may require that several old canes be removed and the bushes be pruned to fit the desired shape. Rejuvenating bushes can be quite a challenge if there has been no annual pruning done for several years. The first approach would be to

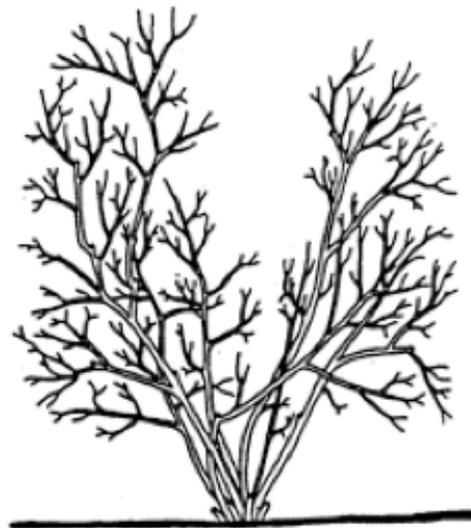


Figure 2. Blueberry bush after pruning.

remove any diseased or broken branches. Secondly, depending on the overall number, the oldest two or three canes should be removed to open up the plant structure. As with any blueberry bush, the center of the plant should be open to sunlight and air movement. The base of the bush (at the top of the root crown) should be tighter than the middle to upper portion of the bush. All branches that are touching and crossing should be removed. Sometimes, the best approach is to cut down the entire bush and allow it to regrow from the roots. This will eliminate any fruit production for a couple of years, but results in a rejuvenated and productive bush thereafter.

What are the tools used for pruning?

Hand tools such as loppers, hand pruners, and handsaws can be used for pruning blueberries. All tools should be sharp and clean at the outset. Select the appropriate tool to remove wood as cleanly as possible to avoid unnecessary injury to the plant. Hand pruners can be used to effectively remove one- year-old wood. If the wood is two or three years old, it is suggested that a lopper or saw be used to cut through the heavier wood. Occasionally wood is too thick or positioned in such a way that it is difficult to cut cleanly with loppers or handsaws. In such a case, a cordless reciprocating saw is an excellent tool.

Summary

Learning to master the art and science of pruning blueberries takes time and practice. Contact your University Extension Educator for updated information on pruning. Make sure your blueberries are pruned each year to maintain the size and shape of the bushes to maximize fruit production and increase the overall fruit quality.

Illustrations from PennState Small Scale Fruit Production Guide used by permission.

Balance Pruning Grapes

Joe Fiola, University of Maryland

I Critical Step in Maintaining/Adjusting Vine Balance

A major theme of viticulture is that for a vine to consistently produce high quality fruit it must be “in balance.” That means that the amount of vegetative growth (shoots and leaves) is just right to properly ripen the reproductive growth (fruit load). Too little fruit may lead to an over-vigorous vine, shaded fruit and lower quality. Too much fruit may decrease vigor to a point where there is not enough photosynthetic area to properly ripen the crop leading to under-ripe fruit and reduced quality.

The first step in achieving proper vine balance is choosing the proper training system for that variety on that site. The next step to annually adjust and maintain that balance is through dormant pruning. Mature grapevines require annual pruning to remain productive and manageable. An average grapevine will have 200 to 1000 buds on mature canes capable of producing fruit. If all of the buds were retained it would result in the over-cropping scenario described above.

To avoid this situation, researchers have developed a method of pruning to balance the fruit productivity and vegetative growth that will give maximum yields without reducing vine vigor or wood maturity. This procedure is appropriately referred to as “Balanced Pruning,” as the amount of pruning is based on the vigor of the vine.

Here are some of the specifics of proper balanced pruning:

- The way to quantify vigor is through vine size, which is determined by the weight of one-year-old cane pruning.
- To balance prune a grapevine and estimate the vine size, roughly prune the vine, leaving enough extra buds to provide a margin of error.
- Then weigh the one-year-old cane prunings (small spring scale) that you just cut off and apply the weight to the pruning formula to determine the number of buds to retain per vine.
 - *For Concord vines, the pruning formula is 30+10, which means leave 30 buds for the first pound of prunings plus 10 buds for each additional pound. A vine with three pounds of prunings would require a total of 50 buds, 30 for the first pound plus 10 for each additional pound.*
 - *Here are some other variety examples and their “typical” bud count formula. Remember, each variety will behave differently in different environments, so these are meant to be suggestions and used as a starting point and adapted for the vigor of your site.*
- To final prune that vine, continue to prune the spurs or canes until you have remaining the number of buds you calculated from the pruning weight formula for that vine.

- Remember we are ultimately looking for 3-5 shoots per linear foot of row during the growing season, depending on the cluster size of the specific variety. Future Timely Viticulture issues will address timing and other critical issues.

II Timing

Pruning a vine causes it to deacclimate similarly to a warm spell, so do not prune (especially very sensitive varieties) when you know you will experience very serious cold shortly afterwards.

The best thing to do is to try to delay pruning as long as practically possible. If you could accomplish all of your pruning in the last two weeks of March that would probably be best, although that is typically not enough time for most commercial vineyards.

Delayed pruning also allows for better estimation of winter injury to buds so that adjustments in bud number can be made.

If you cordon prune it is sometimes best to “rough prune,” maybe down to 12-16 inch spurs initially and then down to your final 2-3 bud spurs.

- This “rough pruning” will inhibit the development of the critical count buds on the spurs you are maintaining compared to cutting directly back to a 2-3 bud spur.
- For early budding varieties (Chardonnay) pruning to final 2-3 bud spur is accomplished only after danger of late frosts has passed.

As much as possible, prioritize your pruning schedule according to the relative susceptibility to winter injury of each variety.

- Prune vines on the best sites first and the worst sites last.
- Prune American varieties first
- Followed by the cold resistant hybrids (Foch, Baco Noir, Seyval)
- Followed by the more cold sensitive hybrids (Vidal, Traminette Chambourcin)
- Save the vinifera for last, doing the least cold sensitive first. (Riesling, Cab Franc)
- And the more sensitive vinifera (Merlot?) for very last.
 - *You may have developed a feel for the “relative” cold sensitivity of the vinifera varieties at your site based on experiences in test winters. Remember, the relative hardiness may change from region to region and vineyard to vineyard.*

- Also early budding varieties (Chardonnay) should be pruned as late as possible to delay bud break and avoid late frosts. Rough prune first as described above, and

only make final cuts down to count buds after all danger of frost has passed.

(*Source: Maryland Timely Viticulture, March 2012*)

SPECIALTY FRUITS

Pruning Elderberries

Patrick Byers, University of Missouri Extension and Andrew Thomas, University of Missouri Southwest Center

The American elderberry (*Sambucus canadensis*) is a medium to large multiple-stemmed shrub or small tree. During our initial investigations into elderberry culture in the Missouri Elderberry Development Program, we noted that elderberries in a wild undisturbed state produced flower cymes of varying sizes on shoots of different ages. The bloom season was often extended over several weeks, with a corresponding fruit harvest season of 3-4 weeks. We were excited to note, however, that disturbed plants, such as those regularly cut back by mowers, often produced a crop of large cymes on the new shoots that grew the following season after the mowing.



Elderberries are for the most part harvested by hand, and we were interested in developing cultural management strategies that could make this tedious (and expensive) part of growing elderberries more efficient. For example, could we develop a pruning strategy that resulted in larger flower (and fruit) cymes, a concentrated ripening period, and a presentation of fruit cymes that made harvest easier? We were also interested in developing pruning methods that streamlined pruning that without sacrificing yield or fruit quality.

We designed a pruning trial to evaluate 4 pruning methods: annual removal of the plants to the ground; removal of the plants to the ground every 2 years; touch up pruning that maintained older shoots; and unpruned plants. We included three elderberry cultivars or selections in the trial, planted in a replicated fashion with 6 replications, and established the research plantings at 2 sites in Missouri. The plantings were established in 2000, and the study was conducted for 7 years.

As might be expected, many interactions among the research variables were noted in the study, and in particular it was difficult to make general statements regarding yield and pruning method. However, cyme number and size were more clearly and consistently affected by pruning treatments than were yields, and manipulation of cyme number and size appears practical and achievable with pruning. Annual pruning generally resulted in the production of fewer, larger cymes across both locations and all three cultivars. This same response was evident on plants that were pruned to the ground bi-annually; during the year of pruning, fewer larger cymes were produced, with cyme number increasing and cyme size decreasing the subsequent year. These results suggest that cyme number and size are directly affected and can be precisely manipulated by pruning. Indeed, this aspect of elderberry pruning management may be more important than yield effects. In most cases, producers would prefer harvesting fewer, larger cymes rather than more numerous, smaller cymes in terms of harvest efficiency and post-harvest handling.

Fruit ripening date was, in many cases, significantly affected by the pruning treatments in this study. The predominant trend was that pruning plants to the ground delayed fruit ripening by several days, and also tended to reduce the number of harvests, focusing the harvest window into a narrower timeframe. Furthermore, because all growth on such plants is new shoots, uniformity of flowering, fruiting, and ripening is achieved. For producers, this system of pruning management would likely increase harvest and post-harvest efficiency, and any potentially lower overall yields might be considered a reasonable trade-off for the greatly simplified pruning and harvest.

We feel that annual pruning of elderberry plant to the ground may be a sound approach for many, though not all American elderberry cultivars. Observations in other studies indicate that not all elderberries selections or cultivars reliably produce fruit on new shoots. We also have noted that European elderberry (*Sambucus nigra*) often does not produce blossoms and fruit on first year shoots.

Reference:

Thomas, A.L., Byers, P.L., & Ellersieck, M.R. (2009). Productivity and characteristics of American Elderberry in response to various pruning methods. *Hortscience*, 44(3), 671-677.

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://extension.oregonstate.edu/catalog/html/ec/ec1361/>)

GENERAL INFORMATION

Winter cleaning of horn-faced bee tubes

Nikki Rothwell, Northwest Michigan Horticulture Research Station

Cleaning horn-faced bee tubes each winter will prevent mite build up. *Osmia cornifrons*, horn-faced bee (HFB), is a pollinator that is native to Japan where they pollinate over 80% of Japanese apples. Horn-faced bees are solitary and because they are not part of a social colony like honeybees, all females are capable of reproducing and each female must forage for its own offspring. This intensive foraging behavior is necessary to supply provisions for their larvae, and this foraging

activity makes them desirable as pollinators in orchard settings. HFB adults are active for 6-8 weeks, April through June, which are the peak pollinating months. These bees are easy to manage, reproduce without difficulty, and do not sting. They require minimal management because after pollination, the offspring develop in their nesting boxes and adults are not seen outside the colony until the following spring. There is only one generation of HFB per season.

We have been experimenting with HFB in cherry orchards in northwest Michigan and have had good success with these alternative pollinators. Unfortunately, many of our HFB colonies have developed a mite problem, likely caused by the reuse of tubes for housing developing HFB larvae. The genus of mites that is causing issues on HFB is *Chaetodactylus*, and we are still in the process of identifying the mites to species. Because both the mites and HFB reside inside the tubes, the process to clean the HFB is somewhat time consuming, but can be done now during the slower winter months. From our preliminary work at the Northwest Station, we have found that regular cleaning will reduce mite populations and help with HFB regeneration and health of the bee colony.



removed, leave behind any masses of yellow pollen mixed with mites. The mites use the pollen as a food source and do not directly parasitize HFB -- they compete with the bee larvae for the pollen while the larvae are developing. If there is a pile or mess of pollen, the larva did not survive as the mites consumed the pollen and left behind the pollen remains. Hence, messy pollen is a bad sign and brown cocoons are a good sign. If you are working for a long time, store loose cocoons in the refrigerator

until ready to rinse.

After all cocoons (or as many are to be completed within a day) are removed from the tubes, place the cocoons into a colander and rinse well with cool water to remove any frass, pollen or mites. We used the spray nozzle on the sink and rinsed them and gently moved them around for 30 seconds. After rinsing, dip cocoons into a 5% bleach/water solution for approximately 30 seconds. All the rinsing and dipping can be performed with the cocoons in a colander.

After the bleach solution, rinse again with cool water and lay in a single layer on top of paper towel to dry completely. Once dry, HFB cocoons are ready for storage until spring. They can be stored in plastic deli containers with holes punched into the lid for air circulation. It would be wise to check periodically for moisture – no mold should be allowed to form.

In the spring, place 100 to 150 cocoons inside a small, dark emergence box with a 5/16" hole cut into one side. Attach or tape the emergence box inside a bucket filled with clean, empty tubes. Place the buckets into the orchard at the appropriate timing to coordinate with bloom. (*Source: Michigan Fruit Crop Advisory Team Alert, Feb. 15, 2011*)

The most effective cleaning protocol is as follows:

Slice open the tubes with the capped ends first. This capped end is an indicator that the tube is relatively filled, or at least partially filled, as they fill the tubes from inside out. Depending on time, tubes without capped ends can be cleaned, but in the interest of time, we started with the capped tubes.

Tubes should be cut along the length of the tube, and the blade should not cut too deeply into the tube so as to not cut into the HFB cocoons inside. Essentially, cut just the cardboard tube to the depth only to open the tube -- not to slice it in half! The cutting is best performed with a sharp, thin razorblade.

Once tubes are opened (and we had to work at physically opening them because they do not just fall open), remove healthy cocoons. Healthy cocoons are small (less than 1/4"), brownish gray, and have small pellets on them. Although they do not look like much, these cocoons house live adult HFB. After cocoons are

NEW! Diseases, Pests, and Beneficial Organisms of Strawberry, Raspberry, and Blueberry

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Elderberry Production in Missouri

Patrick Byers, University of Missouri

Cultivars Several elderberry cultivars are available commercially, including Adams 1, Adams 2, York, Nova, Scotia, Kent, and Johns. Of these, in our trials Adams 2 has consistently outperformed all others. Recommendations from other regions include all these cultivars. A large portion of the commercial fruit crop, especially in the Midwest, is harvested from wild plants. Two selections from the Midwest, Wyldewood and Bob Gordon, were released in 2010 -11 and are available from several sources.



Propagation

Elderberries are easy to propagate. Root cuttings (pencil diameter or slightly smaller, 4-6 inches long) may be dug in early March before growth begins. The cuttings are placed horizontally in a flat or pot, covered with .75 to 1 inch of a light soil or soilless medium, and kept warm and moist. Often a single root cutting will produce 2-3 plants. Dormant hardwood cuttings root easily. Collect 3-4 node cuttings before growth begins in the spring, and place the basal 2 nodes below the surface of a well-drained soil or medium. Be sure that the cutting wood is not cold damaged. A dip of the

basal end of the cutting in an IBA rooting powder may increase rooting. Sprouted hardwood cuttings and softwood cuttings are also easily rooted, provided provision is made to maintain high humidity around the cuttings until rooted. An intermittent mist system works well. A rooting hormone dip may be beneficial. Cuttings of 2-3 nodes root well. Remove a portion of the foliage from softwood cuttings (we usually leave only the 2 basal leaflets of each leaf). Softwood cuttings typically root well until about July 1; rooting percentage drops as the summer progresses.

Establishment

Elderberries tolerate a range of soils, but do best in a moist, well-drained soil. Choose a site that is in full sun. Bare root 1-year plants dug from a nursery work well for planting establishment. Recently propagated container-grown plants may be used to establish plantings during the same season. Plantings may be established from dormant cuttings stuck directly in place in the orchard, but rooting percentage may vary. Berming may benefit plant performance. Plants are spaced 4 feet apart in the planting row, with 10-12 feet between rows.

Pruning

American elderberries produce fruit on shoots older than one year, and also produce suckers from the crown or root system which will bear fruit the first year. Plants may be pruned selectively, leaving a mix of young and older shoots. However, with many cultivars we have learned that the average size of panicles when shoots are renewed annually is significantly larger, suggesting that current season suckers produce larger though fewer panicles. Most of the panicles on these plants were harvested in two harvests, over a period of two weeks.

Fertilization and irrigation

We apply nitrogen annually to the elderberry plantings. Mature plantings receive 60-80 pounds of nitrogen, applied at budbreak in late March – early April. We apply other nutrients every second year if needed based on a soil test (using blackberry recommendations), using a complete fertilizer as the nitrogen source. Elderberries are not drought tolerant, and we irrigate the plantings during dry periods. We use trickle irrigation. The plantings are also mulched, to help conserve soil moisture.

Elderberry pests

While elderberries are relatively pest resistant, we have noted several potential problems in our plantings. An unidentified stem borer causes wilting and dieback of new shoots in April and May. Japanese beetle adults feed on foliage. The adult elder borer, also known as the elderberry longhorned beetle, has been collected from plantings in Missouri. The larva of this beetle bores into the woody parts of the plant. Stink bugs are routinely noted on ripe panicles, but the amount of damage is unknown. A potentially damaging pest is the eriophyid mite, present across Missouri. This mite causes cupping and crinkling of the foliage, and can cause abortion of florets and young fruit. The economic impact can be severe. Fall webworms were also noted in the Mount Vernon planting. An unidentified leaf spot disease, which usually is noted in midsummer, can cause premature leaf drop and occasionally defoliation. Birds of several species will feed on elderberry fruit; those selections with pendulous panicles appear to be less attractive to birds.

Elderberry harvest, yields, and juice parameters

Elderberry harvest takes place in late July, August, and early September. Entire panicles are clipped and harvested when all berries are fully colored. The panicles on current season's shoots ripen later than panicles on older wood. A bush with shoots of mixed age will ripen fruit over a 3 week period. We harvest plants at weekly intervals. Berries may be removed from the panicle by freezing the entire panicle and shaking off the fruit. The berries may be refrozen and processed as needed. Several studies suggest that average yields are around 1200 lb/acre in the first year and 8500 lb/acre in the second and succeeding years. We do not know how long a planting will remain productive; our oldest plantings have produced into year 7.

Uses and markets for elderberry fruit and flowers

At present, most of the elderberries grown in the Midwest are harvested for processing markets. Several wineries produce elderberry wines from the fruit, and the flower panicles are used to flavor wines or drinks. Dried blossoms are used in teas. Jelly and jam are produced from elderberry juice or blends of elderberry and other fruits. Elderberries contain high levels of antioxidants, and elderberry juice and concentrate are marketed as nutraceuticals. The pigments in elderberry juice are suitable for colorant use. Fresh or dried fruit are used in baking and energy bars.

Reprinted from: Proceedings of the 2011 New England Vegetable and Fruit Conference, December 13-15, 2011. Additional information on elderberry, including yields, juice qualities, and results of research projects, is available from the author.

(Source: New York Berry News, Vol. 12, No. 2, February 2013)

UPCOMING MEETINGS:

February 22, 2013 - 4th Annual UVM Extension Winter Hops Conference. 9am – 4:30pm. The Essex Resort & Spa, 70 Essex Way, Essex, VT. For more information see: <http://www.uvm.edu/extension/cropsoil/wp-content/uploads/2013-Hops-Conference-flyer-4.pdf>

February 23 – March 1, 2013 - 56th Annual Conference of the International Fruit Tree Association. Boston, MA. For more information see: <http://www.ifruitree.org/?page=AnnualConference2013>.

February 23, 2013 - Agriculture & Food Conference of Southeastern Massachusetts, 8:30 – 5:00. Bristol County Agricultural High School, 135 Center Street, Dighton MA. For more information and to register go to: <http://events.r20.constantcontact.com/register/event?oeidk=a07e6m98qy406f53fb5&llr=jp7zj6bab>.

February 27 – March 1, 2013 – US Highbush Blueberry Council Spring Meeting, in Savannah, GA. More information: 916-983-0111 or www.blueberry.org.

February 27 - 28, 2013 - 2013 Harvest New England Agricultural Marketing Conference & Trade Show, Sturbridge Host Hotel, 366 Main Street, Sturbridge, MA 01566. For more information and to register, go to: <http://www.regonline.com/builder/site/Default.aspx?EventID=1135517>

Feb 27-28, 2013 - Ecological Landscaping Association 19th Annual Conference. MassMutual Center, Springfield, MA. For more information and registration, go to: <http://www.ecolandscaping.org/conference/registration/>.

March 9, 2013 – *Mass Ag in the Classroom Annual Winter Conference*. Baird Middle School, Ludlow, MA. For more information and to register, see: http://aginclassroom.org/Conferences_Workshops/Annual_Winter_Conference/Winter%20Conference%20Brochure%202013.pdf.

March 13, 2013 – *Cape Cod Cranberry Growers' Association Winter Meeting*, in Hyannis, MA. More information: 508-866-7878, info@cranberries.org, or www.cranberries.org.

March 14-15, 2013 - 2013 Eastern Apple Precision Orchard Management SUMMIT. Ramada Geneva Lakefront, Geneva NY. For more information, see: http://blogs.cornell.edu/fruit/files/2013/02/apple_summit_brochure-1iwuvgk.pdf.

If you know of an event that would be suitable for this list, please forward to sgs@umext.umass.edu

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