

UMass
Extension

CENTER FOR AGRICULTURE

Berry Notes

Prepared by the University of Massachusetts Fruit Team

February 2012 Vol. 24, No. 2

www.umass.edu/fruitadvisor/berrynotes/index.html

Massachusetts Berry Notes Underwriters:

Since 1932
The Best Berry Plants

- Strawberries, raspberries, blueberries, blackberries, asparagus and more!
- Where the pros go for plans and plants.
- Call for a free catalog and plasticulture guide!

41 River Road, South Deerfield, Massachusetts 01373
NOURSE
www.noursefarms.com 413.665.2658

Berry Notes is edited by Sonia Schloemann with articles written by other contributors with attribution; sources are cited. Publication is funded in part by the UMass Extension Agriculture & Landscape Program, subscription fees and generous underwriting. Questions can be directed to Sonia Schloemann at 413-545-4347, sgs@umext.umass.edu. Please cite this source if reprinting information that originates here.

□

IN THIS ISSUE:

SHORTS

STRAWBERRY

- ❖ Strawberry Mulch Touch-up

RASPBERRIES/BLACKBERRIES

- ❖ Pruning Brambles

BLUEBERRIES

- ❖ Pruning Blueberries

GRAPES

- ❖ Balance Pruning Grapes

SPECIALTY FRUIT

- ❖ Pruning Elderberries
- ❖ Pruning Gooseberries and Currants

GENERAL INFORMATION

- ❖ Winter cleaning of horn-faced bee tubes
- ❖ Using gypsum in fruit production
- ❖ Signup Established For Emergency Forest Restoration Program (Efrp) Following Tornado Damag
- ❖ Massachusetts Department of Agricultural Resources - 2012 Grant Programs

UPCOMING MEETINGS

SHORTS:

USDA NRCS Announces EQIP Signup Dates – Energy Efficiency Included - The United States Department of Agriculture's Natural Resources Conservation Service (NRCS) has announced three rounds of funding for four conservation program in Massachusetts. These federal programs, authorized under the 2008 Farm Bill, provide financial and technical help to farmers and forest land owners to protect soil, water and other natural resources. The assistance is available through the **Environmental Quality Incentives Program (EQIP)**, the **Wildlife Habitat Incentive Program (WHIP)**, **Agricultural Management Assistance (AMA)**, and the **Grassland Reserve Program (GRP)**, all administered by NRCS. For more info click [here...](#)

What Can Mother Nature Do to Japanese Beetles? - So what about winter weather extremes? Could they knock the pest down a few notches? The answer to that question is..... [read more](#)

Second Massachusetts Farm to School Convention - March 15, 2012 - Come hear how inspiring food service directors, educators, students, parents, and community members are building connections between schools and farms in Massachusetts - and learn what you can do to further those connections. For more info click [here...](#)

Growing Strawberries Organically – New resource from the Canadian Organic Growers Assoc. See <http://www.cog.ca/news/47/15/NEW-Growing-Strawberries-Organically/> for more information.

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.

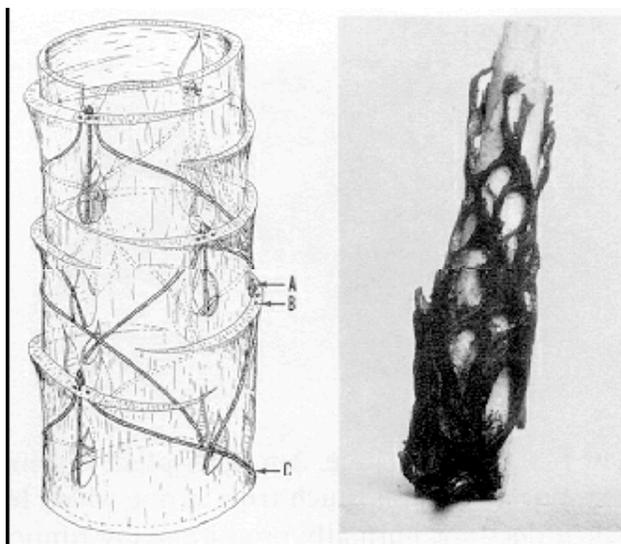


Figure 1. Morphology of the strawberry crown. (from G.M. Darrow, *The Strawberry: History, Breeding and Physiology*; <http://www.nal.usda.gov/pgdic/Strawberry/darpubs.htm>)

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)

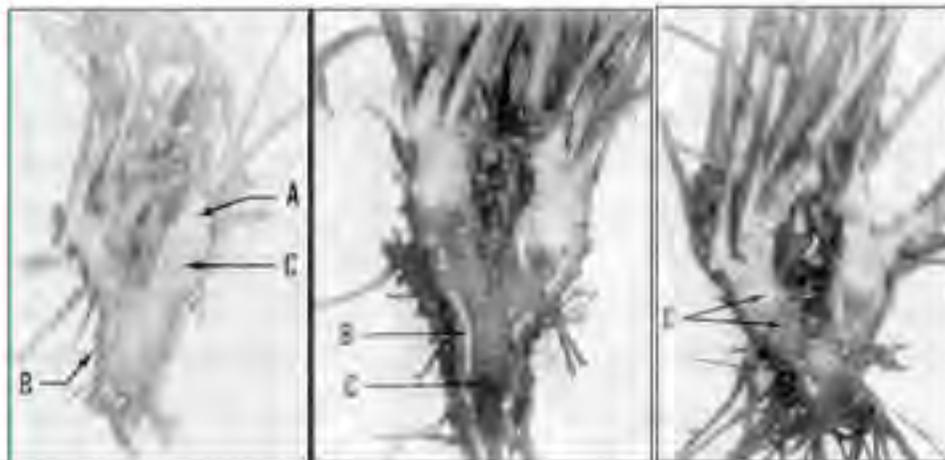


Fig 3. Cold injury to strawberry crowns. Uninjured crowns would have white centers at A. 1. The most serious injury occurs when the cambium that carries sap and food is killed. Slight recovery is shown by new cambium in 1 and 3 at B. Plant 2 would not have recovered. The darkening of the centers of the 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

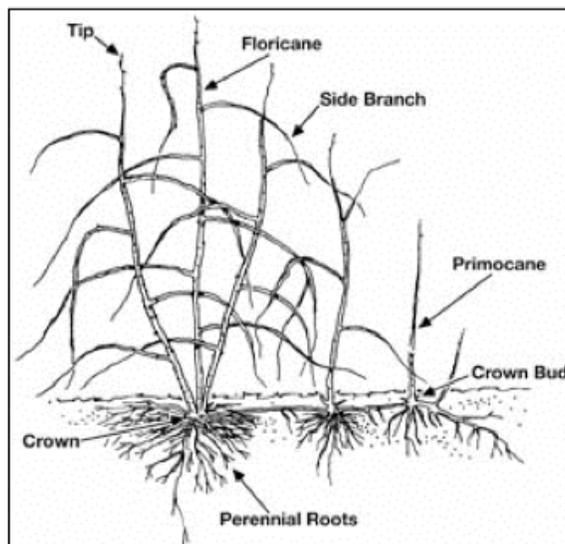
Introduction

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

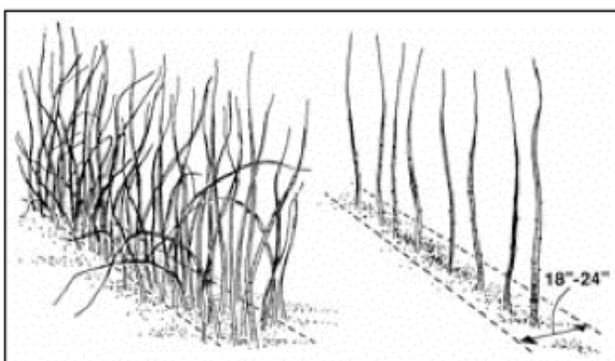
production and ripening. An open growth habit for raspberry rows allows for good air circulation and drying conditions which helps reduce the incidence of fruit rots. This also allows for sunlight penetration into the fruiting zone and promotes ripening and heightens flavor.

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:

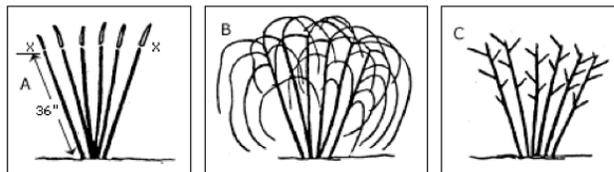
- 1) remove spent floricanes (fall – winter)
- 2) thin remaining primocanes to 6-8” apart, weed out spindly or broken canes, keep healthy robust canes (March)
- 3) re-establish 12-18” row width (March or later)
- 4) top remaining canes to 5” above top trellis wire (48 – 60”)



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 2010*)

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

Using Gypsum in Fruit Production

Eric Hanson, Michigan State University

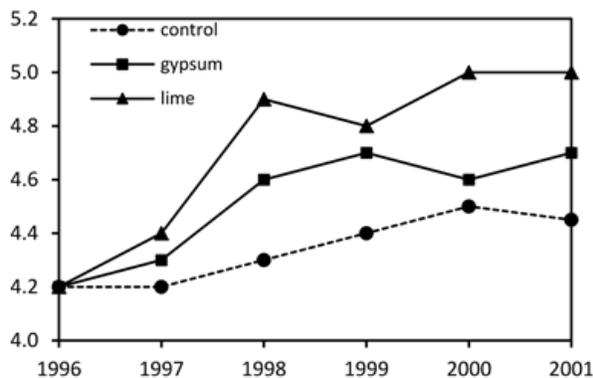
When and why to apply gypsum in fruit production is unclear to many growers. Gypsum is beneficial where soils are unusually low in calcium or high in sodium, or where *Phytophthora* root rot of raspberries is present. Here are the current recommendations.

Gypsum may have some utility in Michigan fruit production, but there is often confusion about when and why it should be applied. It also has not been fully tested on all fruit crops so some information is lacking. Current knowledge and recommendations are reviewed here.

Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) contains about 22% calcium and 18% sulfur. Solubility is moderate (2410 mg/L), but much higher than that of lime (15 mg/L). This means that gypsum supplies free Ca^{++} to the soil solution more quickly than lime.

Soil pH

Unlike lime, gypsum has little if any effect on soil pH. Lime raises pH due to the reaction of carbonate (CO_3), not Ca. In extremely acidic soils (pH below 4.5) that contain high aluminum levels, gypsum may increase pH slightly. The chart below illustrates this effect. We applied annual applications of calcitic lime (1,000 lb/acre) or gypsum (500 lb) to a very acidic blueberry soil. Gypsum clearly increased pH, but not nearly as much as lime. If the initial pH of this soil was 6.0 or 7.0, gypsum would likely have had no effect on pH.



Nutrient value

Gypsum contains about 22% calcium and 18% sulfur. If these nutrients are deficient, gypsum can be an economic source. However, Michigan soils nearly always contain adequate calcium if pH is in the proper range. Soil sulfur levels also are generally adequate for Michigan fruit crops. This is partly due to the calcareous nature of much of the parent material contributing to Michigan soils. In fact, several gypsum mines operate in Michigan's southern (lower) peninsula.

Part of the interest in gypsum is due to the fact that high fruit calcium levels can enhance the quality of various fruits. Unfortunately, increasing soil calcium levels does not generally elevate levels in the fruits, but can

reduce magnesium or potassium uptake. Adding more calcium to soils that already contain sufficient amounts can cause deficiencies of magnesium or potassium. Fruit crops benefit from balanced levels of calcium, magnesium and potassium. A healthy balance, expressed as a percentage of soil bases, is 60-70 % calcium, 20-30 % magnesium, and 10 to 20 % potassium. If calcium represents less than 60% of the bases, particularly on sandy soils, gypsum may be helpful.

Soil structure and drainage

In soils with good structure, clay particles are clumped together (flocculated) to produce channels that speed drainage. Ions that carry a double positive charge (divalent cations) such as calcium and magnesium promote flocculation, whereas ions with a single positive charge (sodium, potassium) tend to disperse clay particles and plug drainage channels. If soils are high in sodium, adding calcium as gypsum displaces sodium from soil particles and improves structure. Fortunately, few soils in Michigan are compromised by excessive sodium, so gypsum is unlikely to enhance soil structure and drainage in our area.

Diseases caused by *Phytophthora*

Gypsum has been shown to reduce disease caused by some species of the fungi *Phytophthora*. The effect does not appear to be related to improved drainage, but rather to the specific effects of high soluble calcium concentrations on growth of the fungal pathogen. *Phytophthora* root rot of raspberries is one such case. In sites with a history of root rot, pre-plant applications of 3-5 tons of gypsum are suggested. More research is needed to understand when benefits can be expected and whether other *Phytophthora* diseases of Michigan fruit crops might also be suppressed by gypsum use.

Gypsum can be a useful soil conditioner and source of calcium and sulfur for crops. Because Michigan soils generally contain sufficient calcium and sulfur for fruit production, gypsum is only expected to be beneficial where soils are unusually low in calcium or high in sodium, or where *Phytophthora* root rot of raspberries is present. (Source: Michigan State Fruit Crop Advisory, Jan 3, 2012)

Signup Established For Emergency Forest Restoration Program (Efrp) Following Tornado Damage

Hadley, MA, February 2, 2012 – Hampden County USDA Farm Service Agency (FSA) County Executive Director Ted C. Smiarowski Jr., announced that the official signup for cost-share assistance under the Emergency Forest Restoration Program (EFRP) began on January 23, 2012 and ends

on March 23, 2012. Owners of farmland in Hampden County who suffered severe damage from the June 1st tornadoes may be eligible for assistance under the EFRP. While the USDA-FSA has already been accepting applications from woodland owners; this announces an official signup period that is required by program regulations.

A non-industrial private woodland owner qualifying for EFRP assistance may receive financial assistance levels not to exceed 75 percent of the eligible cost of restoration measures which are aimed at restoring forest related resources. The following types of measures may be eligible:

- EF5 Upland Hardwood Forest Restoration
- EF6 Upland Softwood Forest Restoration
- EF7 Upland Mixed Forest Restoration

To be eligible for assistance, practices must **not** be started until **all** of the following are met:

- an application for financial assistance (FSA-848) has been filed
- the local FSA County Committee (COC) or its representative has conducted an onsite inspection of the damaged area
- the Agency responsible for technical assistance, such as the Department of Conservation and Recreation (DCR) has made a needs determination.

Farmland owners in Hampden County who may have suffered a loss should contact Ted C. Smiarowski, Jr. at the USDA Office located at 195 Russell St. Suite B5, Hadley, MA 01035 (413-585-1000 ext. 2). (*Source: FSA – MA Announcement*).

Massachusetts Department of Agricultural Resources - 2012 Grant Programs

Craig Richov, MDAR

The Massachusetts Department of Agricultural Resources (MDAR) has a number of business planning and environmental programs with grants available to help agricultural operations make farm improvements that enhance their economic viability and help prevent environmental resource impacts. Request for Responses with Application are dependent upon funding each year, typically available in April through June. Below are descriptions of the programs, with more information at the following website: www.mass.gov/agr/programs

Farm Viability Enhancement Program (FVEP)

The Farm Viability Enhancement Program (FVEP) is a business planning and technical assistance program that provides management advice and grants of \$25,000 to \$75,000 to implement farm growth and sustainability strategies. Farm operators receive grant awards for signing a 5 or 10 year Agricultural Covenant, to keep their property in agricultural use, and receive valuable consultations and visits from a team of experts to discuss needs on the farm, such as farm production and management, marketing, and business planning. Typical uses of funds include building or repairing farm structures, modernizing field equipment. For more information, contact Craig Richov at 617-626-1725 or Craig.Richov@state.ma.us

APR Improvement Program (AIP)

The APR Improvement Program (AIP) provides funding, technical assistance, and business planning to farms with land that has already been protected through MDAR's Agricultural Preservation Restriction (APR)

Program. buildings - such as storage barns, livestock structures, farmstands or processing facilities. For more information, contact Melissa Adams at (413) 268-8269 Melissa.AdamsAIP@gmail.com

Matching Enterprise Grants Program (MEGA)

The Matching Enterprise Grants for Agriculture (MEGA) Program helps with business expansion on new and beginning farms. MEGA provides technical assistance and business planning help, and then provide funds for farm improvement strategies. For more information, contact Kate Hayes at 413-559-0949 or mega.coordinator@gmail.com

Agricultural Environmental Enhancement Program

The purpose of AEEP is to support agricultural operations that are looking to install conservation practices that prevent direct impacts on water quality, ensure efficient use of water, as well as address impacts on air quality. Contact Laura Maul at 617-626-1739 Laura.Maul@state.ma.us

Agricultural Energy Grant Program

(Ag Energy) is a competitive grant program that funds agricultural energy projects in an effort to improve energy efficiency and to facilitate adoption of alternative clean energy technologies by Massachusetts farms in order that farms can become more sustainable and the Commonwealth can maximize the environmental and economic benefits from these technologies. Contact Gerry Palano 617-626-1706 Gerry.Palano@state.ma.us

UPCOMING MEETINGS:

- February 6-8, 2012** – *NASGA Annual Meeting and Conference*. Harrah's Las Vegas, Nevada. For more information and to register go to www.nasga.org.
- February 7, 2012** – *Massachusetts Farm Winery and Growers Association Annual Meeting*, Publick House, Sturbridge MA. 8am – 5pm. See http://www.masswinery.com/web/?page_id=95 or contact Kim LaFleur at masswinery@gmail.com for more information. 1 pesticide credit available.
- February 10-12, 2012** – *NOFA-VT Winter Conference*. University of Vermont, Burlington VT. For detailed program and registration information go to <http://nofavt.org/annual-events/winter-conference>.
- February 14, 2012** - *High tunnel winter growing and seeding meeting*, Slack Hollow Farms, Argyle NY. 10a.m. to 12 p.m. For more information or to register contact Laura McDermott at lgm4@cornell.edu or 518-746-2562. This meeting is free for growers enrolled in the CDVSFP, for others the cost is \$10.
- February 16, 2012** – *Covers for All Reasons: How to Choose the Cover Crops your Farm Needs*. Old Sturbridge Village Visitors Center Theater, 1 Stallion Hill Rd., Sturbridge MA. 10am – 3pm. \$20 includes lunch. Registration required. Contact Heather Faubert, hfh@uri.edu or 401-874-2967 by Feb 9th.
- February 16, 2012** - *Hudson Valley Fruit Meeting: Berry Day*. This meeting is part of a 3 day meeting. More information and registration can be found at <http://hudsonvf.cce.cornell.edu/calendar.html#fs>.
- February 21-22, 2012** - *Ontario Fruit and Vegetable Convention Berry Program*. Embassy Suites, Scotiabank Convention Center Niagara Falls. For more information go to www.ontarioberries.com.
- February 25, 2012** - *5th Annual Agriculture & Food Conference of Southeastern Massachusetts* Bristol County Agricultural High School (BCAHS), 135 Center Street, Dighton, MA. For more info or to register, go to <http://semaponline.org/>.
- February 29, 2012** - *Capital District Vegetable and Small Fruit Growers Annual Winter Meeting*. Albany Airport Inn, 200 Wolf Rd, Albany. 9 a.m. to 3:30 p.m. The cost of the meeting for enrolled members is \$30 for the first person and \$20 for each additional person from the same farm, or \$50 per person not enrolled in the CDVSFP. For more information or to register please contact Marcie at mmp74@cornell.edu or at 518-272-9524.
- March 3, 2012** – *NOFA-CT Winter Conference*, Manchester Community College Manchester, CT. For detailed program and registration information go to www.ctnofa.org/events/CAOC/2012/2012_Winter_Conference.html.
- March 9, 2012** - *Diseases of Greenhouse Crops*, Publick House, Sturbridge MA. 9:30am – 12:30pm. 3 Pesticide recertification credits offered. For more information go to: <http://extension.umass.edu/floriculture/> or contact Tina Smith, tsmith@umext.umass.edu
- March 8, 2012** – *Maine Vegetable & Fruit School*, Seasons Conference Center, 155 Riverside Street, Portland, Maine. \$35 registration. For detailed program and registration information go to <http://umaine.edu/highmoor/blog/2011/12/20/vegetable-fruit-school/>.
- March 9, 2012** – *Maine Vegetable & Fruit School*, Bangor Motor Inn, 701 Hogan Road, Bangor, Maine. \$35 registration. For detailed program and registration information go to <http://umaine.edu/highmoor/blog/2011/12/20/vegetable-fruit-school/>.
- March 13, 2012** – *Commercial Berry Grower Update (NY)*, Cornell Cooperative Extension of Broome County, 840 Upper Front St., Binghamton, NY. \$30 To register or for more information, contact Carol at clf62@cornell.edu or (607) 772-8953.
- March 19, 2012** - *NOFA-NH Winter Conference*. Exeter High School, Exeter NH. For detailed program and registration information go to <http://www.nofanh.org/winterConference>.
- March 29, 2012** – *Employee Training for Garden Retailers*, Publick House, Sturbridge MA. 9:00am – 3:00pm. One pesticide recertification credit offered. Details and Registration (by mail or on-line): <http://extension.umass.edu/floriculture/> or contact Tina Smith, tsmith@umext.umass.edu

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