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# Berry Notes

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## UP Front FYI:

**New England Small Fruit Pest Management Guide available:** the 2010-2011 edition of the New England Small Fruit Pest Management Guide is available for \$16 (\$12 plus \$4 s&h) and can be ordered through the UMass Fruit Team Website at <http://www.umass.edu/fruitadvisor/fruitsubscriptions.htm> or by contacting your state's Cooperative Extension Specialist.

## Massachusetts Agriculture Day at the State House

SAVE THE DATE: THURSDAY, APRIL 7, 2011

From the Berkshires to the Cape, to the farmers' markets in Boston, each year this exciting event draws hundreds of farmers, agriculture officials, legislators, and industry leaders from across the Commonwealth. Participants gather at the State House to acknowledge not only the positive impact and economic growth of agriculture in Massachusetts but also to discuss issues and legislation affecting their farms and communities.

The event includes a speaking program, 'Agriculture Day' awards, informational exhibits and a reception featuring Massachusetts' farm and specialty food products. Please join MDAR and many others from the agricultural community in recognizing the contributions of Massachusetts' farmers; learn more about the department's current and new programs and its efforts to maintain the long-term viability of Massachusetts' agriculture; and celebrate Massachusetts agricultural products which benefit all Massachusetts residents.

For more information, contact the MA Agricultural Promotional Board at [agpromoboard@mfbf.net](mailto:agpromoboard@mfbf.net)

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## STRAWBERRY

### Points to Ponder — Choosing Strawberry Varieties

*Courtney Weber, Cornell University*

I often get asked by growers — “What variety of (straw-, rasp-, blue-, goose-) berry should I plant?” My answer is almost always — “It depends” and then we talk about some of the things that need to be considered. I ask growers to tell me what their goals are.

For strawberries, do you want early season fruit to bring in customers to start your season or to go with rhubarb or asparagus? Then you need an early variety such as ‘Earliglow’ or ‘AC Wendy’.

Do you worry about late frosts? Then maybe avoid the earliest varieties and start with ‘L’Amour’ and ‘Darselect’.

Do you want to have berries past the 4<sup>th</sup> of July? Then ‘Ovation’ and ‘Cabot’ are possibilities.

Where do you market - wholesale, u-pick, ready- picked on farm or at farmer’s markets? Wholesale markets usually require larger fruit with brighter color such as ‘L’Amour’, ‘Jewel’ and ‘Cabot’.

U-pick are usually more discerning consumers who will sample the fruit so high flavor varieties are indicated such as ‘Earliglow’, ‘L’Amour’ and ‘Jewel’ and varieties that freeze and process well such as ‘Clancy’ and ‘Honeoye’. Be sure to let consumers know with signs or verbally which varieties are best for which purpose!

Ready picked markets (farm and farmer’s markets sales) benefit from both high flavor and large size since customers buy with their eyes but often consume immediately. Try varieties like ‘L’Amour’, ‘Jewel’, and ‘Darselect’.

Do you have any disease pressure or was the field in strawberries at any time in the past? If red stele, black rot, verticillium and/or general replant disease are a problem you may want to stay away from ‘Jewel’, ‘Honeoye’, ‘Annapolis’ and ‘Kent’. Try more disease resistant varieties like ‘L’Amour’, ‘Winona’, ‘Clancy’ or ‘Mesabi’.

Do you get fog or frequent high humidity? Powdery mildew can be an issue with ‘Darselect’, ‘Annapolis’ and ‘Earliglow’ as well as many day neutral varieties from California like ‘Aromas’ and ‘Diamante’.

No one variety will fill all needs. I generally suggest 3 or 4 varieties with variable harvest seasons so the risk from adverse weather and site conditions is not concentrated on one variety.

The same principles apply to other berry types. If you know your goals then answering — “What variety should I grow?” is a little easier. (*Source: New York Berry News Vol. 10 No. 1, January 2011*)

### Spotlight on Strawberry Tissue Analysis and Spring Nitrogen Recommendations

*Brenda Cleveland, NCDA&CS Agronomist ( <http://www.ncagr.gov/> )*

*Article from The Strawberry Grower*

Soil testing provides lime and fertilizer recommendations to help get the strawberry crop off to a good start. Later, during bloom and fruit stages, the NCDA&CS Agronomic Division recommends using plant tissue analysis on a biweekly schedule to determine if the crop has taken up essential nutrients at optimum rates. This test includes a measurement of the petiole nitrate-nitrogen (NO<sub>3</sub>-N) concentration.

For plasticulture strawberry, NCDA&CS recommends 120 lbs nitrogen (N) per acre: 60 lbs to be applied preplant and the remaining 60 lbs in the spring during bloom and fruiting. The suggested practice is to apply the spring N through the drip tape at a rate of 5.25 lbs per acre (actual area, not area under plastic) per week.

Fertilization of an intensively managed, high-value crop like strawberry requires knowledgeable decision-making. Potential consequences of too much N include soft fruit with poor shelf life, reduced yield, poor cost-benefit ratio and environmental pollution. On the other hand, too little

N results in poor growth and reduced yield. The crop uses only about one-third of the preplant N by the time active spring growth begins. At that time, the NCDA&CS Plant Analysis Report should be used to determine the appropriate rate of N to apply.



The plant report's N recommendation is based on the growth-stage week and the amount of NO<sub>3</sub>-N detected in the petiole sample (see page 3). These recommendations are based on work done by Gordon S. Miner (NCSU) and C. Ray Campbell (NCDA&CS) in the 1990s on Chandler and Camarosa varieties. Their research resulted in the development of petiole NO<sub>3</sub>-N sufficiency ranges for each week of the bloom and fruiting growth stages (see table below).

Here is how the recommendations work. When the petiole NO<sub>3</sub>-N concentration is within the desired range, 5.25 lbs N per acre per week

is recommended. When the petiole NO<sub>3</sub>-N concentration falls below the desired range, 7.0 lbs N per acre per week is recommended. When the petiole NO<sub>3</sub>-N concentration is above the desired range, no N is recommended. The recommendations are guidelines and must be used in conjunction with site-specific factors – such as fertilization history, temperature, and pest/disease pressure – to make the most appropriate nutrient management decisions.

The growth stage (GS) and week coded by the grower on the Plant Sample Information form drives the N recommendation. The bloom (B) growth stage starts the first week of bloom and continues for approximately five weeks; the fruit (F) growth stage starts the first week of berry harvest and continues approximately seven weeks or through the final fruit harvest. B week 1 is characterized by the presence of 5–10 open blossoms on at least 50% of the plants. It also means that strawberries will be ready to pick in 4½ to 5 weeks. For example, if a tissue sample is collected on March 15 during the first week of bloom, then the grower should be anticipating berry harvest the week of April 19.

Customized NCDA&CS agronomist comments and recommendations are based on tissue test results and crop growth stage and week. For this reason, it is critical that the Plant Sample Information form be filled out correctly and completely. Recommendations cannot be provided based on analytical results alone. Incorrect or incomplete information on the form may lead to incorrect N recommendations.

For example, a crop with a petiole NO<sub>3</sub>-N concentration of 1600 ppm does not need any N if it is week 1 of bloom, but if it is actually week 2 of bloom, a recommendation of 7 lbs per acre is appropriate. As an alternative, or in

addition, to specifying growth stage and week, the grower can indicate when strawberry harvest will begin or how long it has been underway.

In summary, each strawberry tissue sample should include 25-30 trifoliate leaf blades with the petioles detached, a completed Plant Sample Information form, and a processing fee of \$7 per sample (see a pictorial guide at [www.ncagr.gov/agronomi/pictorial.htm](http://www.ncagr.gov/agronomi/pictorial.htm)). Out-of-state growers are also welcome to use these services, at a cost of \$27 per sample. The NCDA&CS Plant Analysis Report will provide concentrations for 11 of the essential plant elements in the leaf blade as well as petiole NO<sub>3</sub>-N, an interpretation of the results, and recommendations. Recommendations other than the N rate are based upon leaf blade results. For any questions related to strawberry tissue analysis, please contact agronomists Brenda Cleveland or Michelle McGinnis at 919-733-2655 or the regional agronomist assigned to your area ([www.ncagr.gov/agronomi/rahome.htm](http://www.ncagr.gov/agronomi/rahome.htm)). (Source: *Ohio ICM News, February 11, 2011, Volume 15, Issue 2*)

NCDA&CS Nitrate Nitrogen (NO <sub>3</sub> -N) Sufficiency Range and Nitrogen (N) Rate Recommendations by Growth Stage and Week.					
Growth Stage	Week	Petiole NO <sub>3</sub> -N Sufficient Range (ppm)	Nitrogen Rate Recommendation when Petiole NO <sub>3</sub> -N is:		
			<u>Below</u>	<u>Within</u> <i>the sufficient range</i>	<u>Above</u>
B	1	600-1500	7 lb/N/A/wk	5.25 lb N/A/wk	None
	2	4000-6000			
	3	4000-6000			
	4	3500-6000			
	5	3000-5000			
F	1	3000-5000	7 lb N/A/wk	5.25 lb N/A/wk	None
	2	3000-5000			
	3	3000-5000			
	4	2000-4500			
	5	2000-4000			
	6	1500-3000			
	7	1000-2000			

B= Bloom F= Fruit (harvest begins)

## RASPBERRY

### Pruning Summer- and Fall-Bearing Raspberries

Marvin Pritts, Cornell University

Plant growth can be manipulated by growers to achieve long-term increases in production of quality fruit. Pruning affects plant growth rate, fruit quantity and size, soluble

solids (sugars), disease susceptibility, ease of harvest, and spraying efficiency. Brambles respond significantly to pruning, but these practices are usually the most

expensive and time-consuming part of an operation. Growers must use care when choosing pruning strategies. The following discussion presents different types of

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

### **Primocane-Fruiting (fall-bearing) Raspberries**

Primocane-fruiting raspberries produce fruit at the top of first-year canes in late summer. If allowed to overwinter, these same canes will produce fruit again in early summer of the second year. However, the quality of this early summer fruit is inferior to both the late summer primocane crop and summer crops of floricanefruiting types. Also, harvesting the early summer second-year crop is difficult because of interference from new primocanes. Likewise, harvesting the late summer primocane crop is difficult because the primocanes are thinner and taller when the second-year canes are allowed to grow, too. Most growers sacrifice the early summer second-year crop in favor of a smaller, but higher quality late summer primocane crop. The smaller yield of a single late summer primocane crop is offset by the ease of management.

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

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

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

The grower has little control except to choose productive cultivars.

### **Floricanefruiting (summer-bearing) Raspberries and Blackberries**

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

#### **Conventional: No Mowing or Suppression of Primocanes**

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

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

#### **Alternate Year Mowing**

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

#### **Mowing with Primocane Suppression**

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

Removing primocanes, however, is not easy.

Dinitrophenol products can no longer be used, so growers must find other ways to remove primocanes until new products are developed. Some growers have reported success with Gramoxone, Scythe and Goal. The advantages of this method are the ease of pruning when done in early spring, and a reduction in spray materials cost. Disadvantages are a reduction in yield over the long-term, since only half the planting is fruiting in any one year, and the cost of primocane suppression (labor, materials).

#### **Primocane Suppression without Mowing**

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

Primocane suppression has also been reported to increase hardiness. Since there is less shading and fewer demands for water, fruit size and productivity of lower laterals are

increased. Primocanes of vigorous cultivars can still grow to a sufficient height for adequate fruiting the following year.

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

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

#### **Partial Primocane Suppression**

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



## Pruning Black, Red and Purple Raspberries and Blackberries

Ray R. Rothenberger, University of Missouri – Columbia.

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

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

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

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

### Pruning red raspberries

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

### Pruning upright blackberries

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

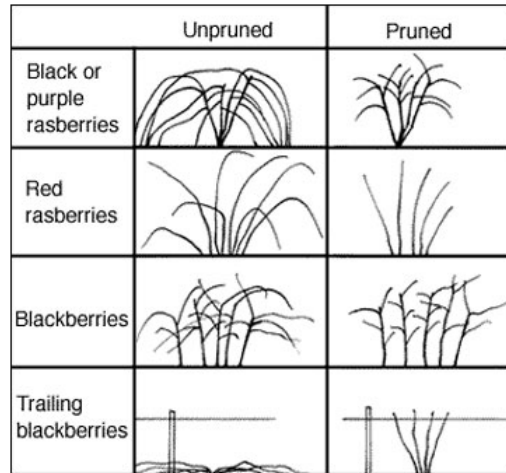
1. Tipping the new canes at a height of 24 to 30 inches to form branched canes.

2. As growth starts, remove all dead and weak canes or branches and head the branches back to a length of 12 to 15 inches or to the degree that the canes can support the expected crop.

3. After the crop is harvested, remove the 2-year-old wood to stimulate the new canes and remove sources of diseases.

### Pruning trailing blackberries (Dewberries, Boysenberries, etc.)

Trailing blackberries are not grown extensively in Missouri because of a lack of hardiness and their susceptibility to



bramble diseases. Like other brambles, they bear fruit primarily on 2-year-old wood. The one-year wood is usually allowed to grow on the ground where it

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

permitted to remain on the ground until the next spring (see Figure 1).

### Additional suggestions

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

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

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

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

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

5. A thorough spray program will assist in producing satisfactory crops of both raspberries and blackberries. (Source: University of Missouri Ag. publication G6000, [http://muextension.missouri.edu/xplor/agguides/hort/g060\\_0.htm](http://muextension.missouri.edu/xplor/agguides/hort/g060_0.htm))

## BLUEBERRY

### Pruning Blueberries in the Home Garden

Marcus Brown, Ohio State University Extension

#### Introduction

Growing blueberries in the home garden can be quite enjoyable. Blueberries have a very fresh taste when picked straight off the bush. Beyond the initial challenge of establishing a new planting, there are really few pests that attack blueberry bushes. Proper weeding, fertilizing, insect and disease control, and proper pruning help to assure quality fruit at harvest. This fact sheet is intended to help home fruit growers gain a better understanding of the principles of pruning blueberry bushes. Refer to the glossary of terms if you are not familiar with some of the terms used in this fact sheet.

For details on blueberry production, refer to OSU Extension Fact Sheet HYG-1422-98, "Growing Blueberries in the Home Garden" (<http://ohioline.osu.edu/hygfact/1000/1422.html>).

**Why is it important to prune blueberry bushes?**

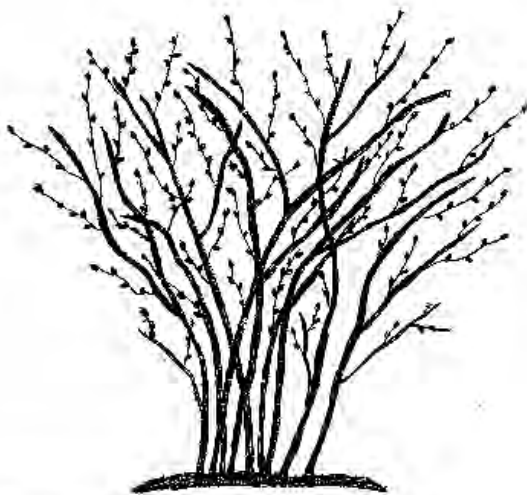


Figure 1. Blueberry bush that is not pruned.

Blueberry bushes that have not been pruned on an annual basis may become overgrown and less fruitful (Figure 1). Proper training of blueberries is essential to maintain plant size, shape, and productivity (Figure 2). In the first two years, it is important to train young blueberry bushes to promote the proper structure of the plant for maximum fruit production. When the blueberries mature, their vegetative canes require annual maintenance.

#### What are the steps to successfully prune a blueberry bush?

Selection of a training system will help guide how you prune your blueberries. Many fruit gardeners prefer to retain two to three main canes that will anchor the bush's

fruit production. Young blueberries are carefully trained to maintain close base at the root crown and an open center to allow sunlight to pass through and allow air movement.

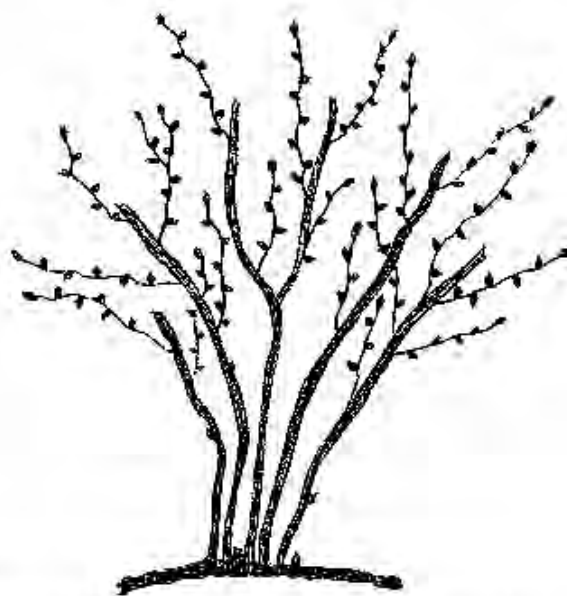


Figure 2. Blueberry bush that has been pruned.

- 1<sup>st</sup> Visually observe the blueberry bush.
- 2<sup>nd</sup> Imagine what the plant should look like when pruning is completed.
- 3<sup>rd</sup> All diseased and broken canes should be removed first.
- 4<sup>th</sup> Canes that are seven years old or older should be considered for removal.
- 5<sup>th</sup> No more than two to three mature canes should be removed each year to avoid pruning out too many fruit buds.
- 6<sup>th</sup> Selective pruning will help to stimulate new cane growth each year.
- 7<sup>th</sup> Remove branches that are touching and any dead twigs.
- 8<sup>th</sup> The bush should be: a) narrow at base, b) open in the center, and c) free of vegetative clutter.

Shoots harden-off as canes with a grayish-brown color and will be approximately pencil size or greater in diameter. Normally, fruiting buds are not counted on blueberry bushes to determine the maximum fruit load.

### **Are individual blueberry varieties pruned differently?**

Most gardeners in Ohio and other Midwestern states grow high-bush blueberries. There is not a great deal of difference in plant characteristics from one blueberry variety to another. Each variety may produce a different number of canes; 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?**

Young bushes generally do not require as much pruning to remove undesirable vegetation. 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 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 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.

### **What are the tools used for pruning?**

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## **GRAPE**

### **Balance Pruning Grapevines**

*Mark Chien, Penn State Cooperative Extension*

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

Hand tools such as loppers, hand pruners, and handsaws can be used to effectively remove all undesired wood from grapevines. 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.

### **Summary**

Learning to master the art and science of pruning blueberries takes time and practice. Contact your county 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.

### **Glossary of Pruning Terms**

**Cane:** A green summer shoot matures (hardens off) into a woody, brown one-year-old cane after leaf fall.

**Fruiting wood:** Wood that produces flower buds during the late summer.

**Node:** The thickened portion of a cane where a fruiting or vegetative bud is located.

**Pruning:** Removal of portions of the canes to help maintain size, shape, and productivity of the bush.

**Shoot:** The green, leafy growth that develops from the blueberry bush root crown.

### **Useful References**

Ohio State University Extension Bulletin 591, *Growing and Using Fruits at Home*.

Ohio State University Extension Fact Sheet HYG-1422-98, “Growing Blueberries in the Home Garden” (<http://ohioline.osu.edu/hyg-fact/1000/1422.html>). (Source: *Ohio ICM News, February 11, 2011, Volume 15, Issue 2*)

Pruning is the act and art of making cuts to remove living vine parts. But pruning is also an important cultural practice in the long-term maintenance of your vineyard. Some would argue that it is the single most important part of the annual vineyard cycle. Its almost impossible to explain how to prune a vine without actually demonstrating how to do it. Therefore, I’ll focus on balanced pruning as a viticultural concept and hope that those who need pruning lessons will attend a workshop.

I would urge every grower to balance prune at least a few vines for every acre of vineyard, if nothing else, just to



get an idea of the general vigor of your vines. This information, along with petiole and soil tests, and 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

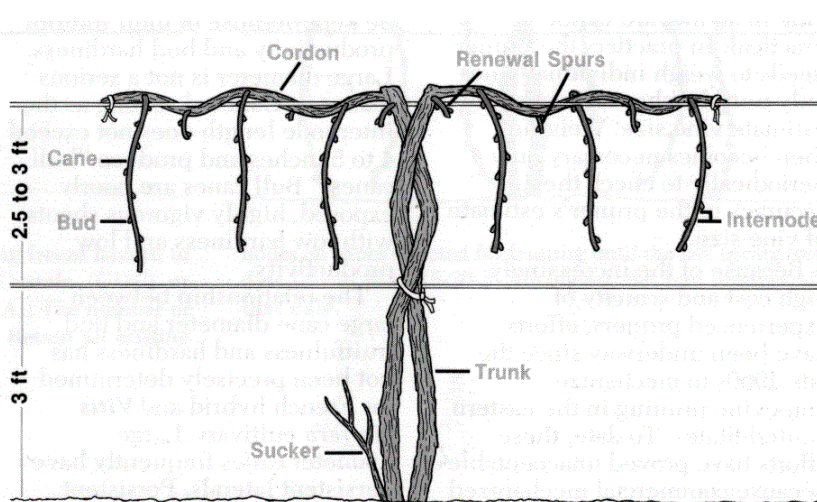
balanced pruning formula, a set of recommendations is given for specific varieties – but these can be adjusted over time for your vines. For example, for Concord the formula is 30 plus 10. That means for the first pound of pruning weight – the measured amount of one-

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*)

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## 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 fanshaped bush on a trellis. Plants trained this

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

## GENERAL INFORMATION

### 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.



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 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*)

### Small Fruit Pesticide Label Changes

*Kathy Demchak, Department of Horticulture Penn State University*

On some labels, we now see the mention of the low-growing berry subgroup (Group 13-07G), which includes low-bush blueberry and cranberry. The use of this grouping allows materials to be used on crops that previously rarely appeared on pesticide labels.

#### Subtraction

**Endosulfan** (trade name Thionex, and formerly Thiodan) use is being terminated due to concerns about worker safety and endosulfan’s ability to accumulate in the food chain. Existing stocks of Endosulfan may still be used.

#### Additions

**Portal**® (fenpyroximate, Nichino America, Inc.) is labeled for use on the low-growing berry subgroup, which includes strawberries. Use of this product is limited to two applications per season at least 14 days apart to avoid resistance development. Fenpyroximate is in IRAC activity group 21A, which is different from other activity groups labeled on strawberries. The pre-harvest interval (PHI) is 1 day, and the re-entry interval (REI) is 12 hours.

**Altacor**® (chlorantraniliprole, aka rynaxypyr®, Dupont) is labeled for use on caneberries (raspberries, blackberries, etc.) for the target pests omnivorous leafroller (not a problem in PA) and raspberry crown borer (adults), which can be a problem here, most frequently on blackberries. The PHI is 3 days, and the REI is 4 hours.

**Danitol**® 2.4EC (fenpropathrin, Valent) is labeled for use on caneberries, (besides strawberries and blueberries on which it had already been labeled) with the most utility against Japanese beetle. It also is labeled for use for two-spotted spider mites, but the use of broad spectrum insecticides such as pyrethroids (part of the pesticide group into which fenpropathrin falls) is tough on beneficial mites, and thus has often resulted in pest mite flare-ups. The PHI is 3 days, and the REI is 24 hours. (*Source: Ohio ICM News, February 11, 2011, Volume 15, Issue 2*)

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#### UPCOMING MEETINGS:

**Feb. 19, 2011.** *Women in Agriculture Conference: Agriculture and Community Connections* (09:00 AM - 03:30 PM) Student Conservation Association - Charlestown, 689 River Road, Charlestown, NH, 03603. For more information see brochure at: <http://extension.unh.edu/Agric/Docs/womeninag2011.pdf>.

**Feb. 23, 2011** *Pollinators* (Wednesday 02/23/2011 - 01:00 PM - 03:00 PM) Grafton County UNHCE Office - 3855 Dartmouth College Highway, North Haverhill NH 03774 **For more information:** Please RSVP by calling Pam Gilbert at 603-353-4651.

**February 23-24, 2011 - Ontario Fruit and Vegetable Convention.** Brock University, St. Catharines, Ontario For more details visit: <http://www.ofvc.ca/>

**Feb. 24, 2011** *Pruning Demonstration: Tree and Small Fruits (Apples, Peaches, Cherries, Plums, Blueberries, Raspberries, and Grapes* (09:30 AM - 12:30 PM) Sunnycrest Farm, 59 High Range Road, Londonderry, NH, 03053 For more information [click here to view flyer](#)

**March 1-3, 2011.** *Harvest New England Agricultural Marketing Conference and Trade Show.* Sturbridge Host Hotel and Conf. Center 366 Main St. Sturbridge MA. For more information and to register go to <https://regonline.activeglobal.com/builder/site/tab3.aspx?EventID=890416>.

**March 5, 2011.** *Planting, Cultivating, and Marketing Juneberries in the Great Lakes Region.* NYS Agricultural Experiment Station, Geneva, NY. More information available soon.



**March 15, 16, 2011** – *Maine Vegetable & Fruit School*. Tuesday, March 15 at KEELEY'S BANQUET CENTER, 178 Warren Avenue, Portland, Maine, Wednesday, March 16 at BANGOR MOTOR INN, 701 Hogan Road, Bangor, Maine. For more information please contact: Mark Hutchinson, 207-832-0343 or [mhutch@maine.edu](mailto:mhutch@maine.edu)

**March 21, 2011** - *Blueberry School: From Field Management to Value Added Products*. 3:15 - 8:00 pm, Rockingham County Nursing Home Auditorium. North Road, Brentwood, NH. To register, or if you have special needs to attend this workshop, call Deb Stevens or Nada Haddad at 603-679-5616 or email deb. [stevens@unh.edu](mailto:stevens@unh.edu).

**April 2, 2011**. Growing Berries in Tunnels and Greenhouses, Cornell Cooperative Extension Office, 480 North Main St., Canandaigua NY 14424. More info at Nancy Anderson (585) 394-3977 x427 or e-mail [nea8@cornell.edu](mailto:nea8@cornell.edu).

**June 22-26, 2011**. *10th International Rubus and Ribes Symposium, Zlatibor, Serbia*. For more information contact: Prof. Dr. Mihailo Nikolic, Faculty of Agriculture, University of Belgr, Belgrade, Serbia. Phone: (381)63 801 99 23. Or contact Brankica Tanovic, Pesticide & Environment Research Inst., Belgrade, Serbia. Phone: (381) 11-31-61-773.

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