

Berries

Pruning and Training Caneberries (Blackberries and Raspberries)

David W. Lockwood, Professor, Plant Sciences

"Caneberries" is a new term being used to replace "brambles" when discussing blackberries and raspberries and hybrids of the two. Brambles denotes the presence of thorns or prickles on a plant, and, since most new blackberry introductions are thornless, it is no longer appropriate. Caneberries may be thorned or thornless, erect, semi-erect (semi-trailing) or trailing in growth habit. In Tennessee, both erect and semi-erect varieties are commonly grown, but trailing varieties are seldom seen.

Proper pruning and training of caneberries require knowledge of their growth and fruiting habits. The root system and crown of caneberries are perennial, meaning that they will live many years, whereas the canes are biennial, meaning that they have a two-year lifespan. The first year of this two-year life cycle is called the "primocane year." During the primocane year, new canes arise from buds at the base of existing canes, the crown or the roots depending on the type of canberry being grown. Growth during the primocane year is vegetative. During the second year, called the "floricane" year, the canes will flower and fruit on short shoots, called "fruiting laterals," which arise

from buds formed in leaf axils during the primocane year. Following fruiting, the floricane will die back to the crown (Diagram 1). In an established planting, both primocanes and floricanes will be present in a planting. There are some blackberry and raspberry varieties that will bear fruit on the primocane in late summer and fall. These are referred to as primocane bearing, everbearing or fall-bearing varieties. They will be discussed later in this fact sheet.

Pruning and training are distinctly different operations, yet they are often used together to achieve a desired effect. Pruning refers to making cuts or canes to promote growth in certain areas, to adjust crop load, to increase fruit quality, and to remove unhealthy or dead canes. Training involves positioning canes to increase sunlight penetration, air movement and spray coverage throughout the canopy. It also is used to make cultural practices, such as harvesting, easier. Trellising is a good example of training. Together, pruning and training have many positive effects on yields, fruit quality, pest control and ease of management.



In a new planting, pruning is used to enhance plant survival and growth. Training is used to support new primocanes, especially with semi-erect varieties. In subsequent years, proper pruning can lessen pest problems by removal of diseased, insect-infested canes and dead canes. Various training systems focus on separating primocanes from floricanes, making harvest and subsequent floricanes removal easier. Light distribution, air movement and spray penetration throughout the canopy will be better where good pruning and training practices are employed. Total yields and fruit quality will both be enhanced in a well-managed planing.

At planting:

New plants may be started from 1-year-old transplants, root sections or tissue-cultured plug plants. New canes on semi-erect trailing blackberries, black and purple raspberries arise primarily from buds at the base of canes or from crown buds, whereas new canes on red and yellow raspberries and erect blackberries arise from buds on the roots. After planting 1-year-old transplants, the stem section should be removed to force new growth from buds on the crown or roots (Diagram 2).

Summer pruning (first year):

For floricanes-fruiting varieties, all canes will be primocanes the first summer, and no fruit production should be expected. Even with erect and semi-erect blackberry varieties, canes are apt to have a trailing habit of growth. They will become more erect in subsequent years.

All caneberries, including erect-growing varieties, appear to show an increase in fruit yields and quality when a trellis is used to support and position canes. Trellis designs can vary from simple, upright ones using a lower and upper wire, to "V" or "Y" trellises where floricanes are positioned on one or both sides of the trellis, and the primocanes are allowed to grow vertically in the center of the trellis to rotating trellises that are turned following bloom to position all developing fruit on one side of the canopy.

With the vertical "V" and "Y" trellises, the primocane is allowed to grow until it surpasses its desired height by 4 to 6 inches. At this time, the primocane is tipped which stops upward growth, stiffens the cane and encourages the development of lateral branches. More lateral branches translate to higher yields during the floricanes year (Diagram 3). Since primocanes begin growth at different times during the summer and grow at different rates, several trips through the planting to head primocanes should be made. Heading primocanes while they are still succulent and relatively small in diameter means that the cuts will heal more quickly than larger cuts, thus lessening the potential for cane blight to develop. Primocanes should be loosely secured to trellis wires.

Canes of vigorous erect or semi-erect blackberries should be topped between 48 and 60 inches aboveground. Less vigorous varieties should be topped at about 36 to 40 inches in height. Black raspberry primocanes should be topped about 24 to 30 inches in height while purple raspberries should be topped about 30 to 36 inches in height. Red- and yellow-fruited raspberry primocanes should not be topped. A support system for these

canes is very important. Weak canes should be pruned out as they develop, and the row should be kept narrow, about 12 to 18 inches in width at the base, to prevent excess shading within the canopy.

Summer pruning (subsequent years):

After the first year, a planting will have both new primocane growth and floricanes. Primocanes should be pruned as previously described. In the spring, floricanes will develop short-fruited laterals that will bloom and form berries. Following harvest, floricanes will die back to the ground. They should be removed from the planting before the onset of growth the following spring. Floricanes removal shortly after harvest is easier and less damaging to developing primocanes than it would be later. Also, removal following harvest may lessen disease carryover in the planting. Floricanes should be cut off close to ground level so that new primocanes will develop from buds on healthy tissue at or below the soil line. Prunings should be removed from the planting.

Dormant pruning:

If not already done, floricanes should be removed. In late winter, lateral branches of blackberries should be pruned back to about 18 inches in length for strong canes and 12 inches in length for moderately strong canes. For raspberries, prune lateral branches back to about 8 to 10 inches in length. Lateral branches within 12 to 18 inches of the ground should be removed entirely. Heading laterals will not decrease yields since most fruit will be borne near the basal part of the laterals, and heading tends to increase fruit size. Thin canes to about 4 to 6 per linear foot of row. Weak, low-growing canes should also be removed at this time as they will bear few fruit and fruit quality will be inferior.

Primocane-Bearing Caneberries

Primocane-bearing caneberries can be managed for a fall crop only or for a fall crop on the primocanes and then a summer crop on the floricanes. The decision regarding which way to manage them is based somewhat on the type of the caneberry and the goals of the grower.

A primocane will grow throughout the early and middle parts of the growing season. Fruit buds will be initiated in the upper one-third to one-half of the primocane, and fruiting will occur in the latter part of summer and in the fall. This section of the primocane will then die back. If the canes are left in the field, floricanes fruiting will occur on the lower part of the canes in early summer and then the rest of the cane will die.

Several red- and yellow-fruited raspberry varieties are primocane fruiting. In many cases, growers decide to grow these raspberries for the fall crop only, since the fall crop is the larger of the two. With primocane fruiting blackberry varieties, the decision regarding fall cropping only is strongly influenced by climate. In cooler regions, the primocane crop is fairly large, and the economics involved in maintaining the planting might be in favor of growing for the fall crop only. However, in warmer areas, the primocane crop is not that large, so the canes are retained for the floricanes crop the following year.

When growing for the primocane crop only, primocanes are allowed to grow and fruit. Canes are then mowed to the ground during winter, and the entire sequence of primocane growth and fruiting is repeated. Significant savings in pruning costs are recognized with this type of system. Control of certain diseases can be accomplished through pruning. By mowing down the planting and removing the residue, disease that may move from floricanes to primocanes will be eliminated since there will never be any primocanes. With raspberries, mowing the planting down results in a larger primocane crop since there will be no fruiting stress on plants early in the summer.

If growing for both the primocane and the floricanes crop, the sequence of pruning cuts will be similar to those of a floricanes-fruiting variety with one exception. Pruning off the dead portion of the primocane following fruiting may lessen disease carryover from one year to the next and will make the planting easier to work and more attractive. Diagram 5 shows the pruning operations involved in a primocane-only fruiting program (Diagram 5A) versus the pruning operations in a floricanes-fruiting variety (Diagram 5B).

Trellising Caneberries

Support systems (trellises) perform several important functions. They minimize cane damage and crop loss to wind and make operations such as pruning and harvesting easier. Light relationships throughout the canopy are better with a trellis than without, thus increasing the potential for high-quality fruit and reduced disease potential. Yields on a supported system may be higher and more accessible than with a non-supported system.

There are several good trellis systems. The two that are outlined are relatively easy to construct and maintain:

The **two-wire vertical trellis** is very similar to the kniffin system used with grapes. Posts are set about 20 to 25 feet apart. The size of the end posts should be based on the length of the row. They need to be set deeper, have supplemental anchors and be larger posts than line posts since all wire tensioning is done from the end posts. The function of the line posts is to hold the trellis wires at a certain height aboveground. Trellis wires should be strong enough and tight enough to avoid sagging as this will affect light relationships within the canopy. End posts should be at least 8 feet long, with 2 feet in the ground. Line posts should be about 7 feet long with 1 1/2 feet in the ground. Use 12-gauge galvanized wire for the upper trellis wire, which should be about 5 feet off the ground for blackberries. For the lower wire, 14-gauge galvanized wire positioned 3 feet off the ground should provide good early support for canes. Fan out primocanes on the wires and tie them loosely to the wire. Top the primocanes during the growing season once they get about 4 to 6 inches higher than desired (Diagram 6).

A **single cross-arm trellis** (Diagram 7) appears to work well with red raspberries. Posts are set about 20 to 25 feet apart. They should extend above ground about 5 feet. End posts should be set about 2 feet deep and line posts about 1 1/2 feet deep. Attach an 18-inch crossarm to the top of the posts and run

a 12-gauge galvanized wire down the row on each side of the crossarm. Position canes between the wires and either loosely tie them to the wires or hold them in place using clips between the wires.

A **double cross-arm trellis** (Diagram 8) uses a 12- to 18-inch crossarm at 3 feet and at 5 feet above ground. Wires should extend down the row on each side of both crossarms. Canes should be positioned between crossarms as they grow.

A **temporary trellis** designed similar to the single or double crossarm trellis can be used in primocane-bearing caneberries being grown for the fall crop only. Holes should be dug 3 feet deep about every 25 feet down the row and lined with a piece of plastic pipe. In midsummer, insert posts 8 feet in length in the holes. Attach 18-inch long crossarms at 30 and 60 inches above ground. Use a heavy twine instead of wire down the sides of the crossarms to contain the canes. Following harvest and before new primocane growth begins in spring, remove the twine and the posts to permit mowing down the entire planting (Diagram 9).

Diagrams 1-9

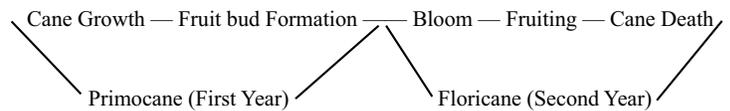


Diagram 1. Biennial life cycle of a bramble cane*
* excluding everbearing types

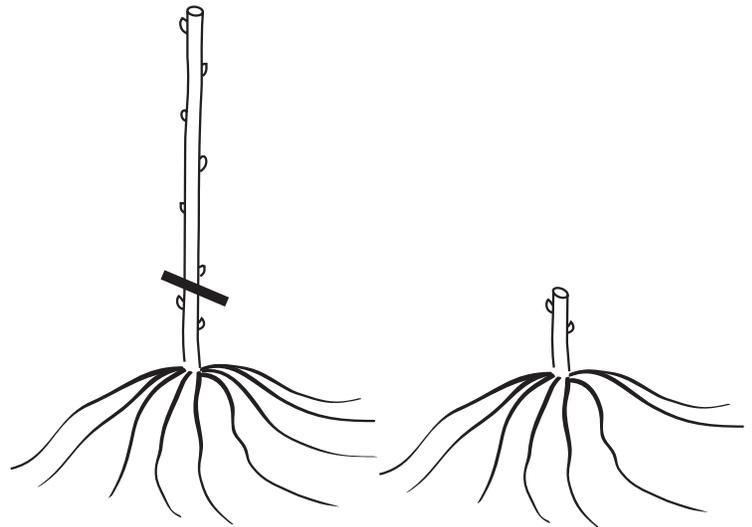
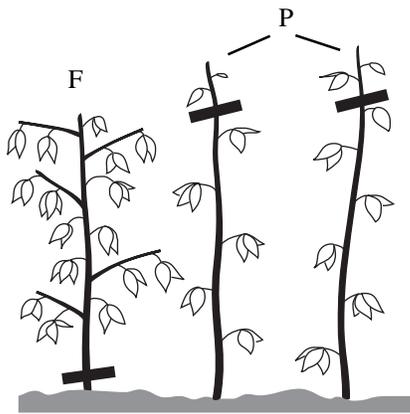
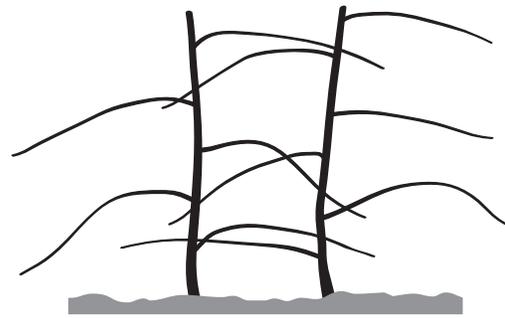


Diagram 2. Head the rooted cutting just above the ground line to force bud break from crown buds.

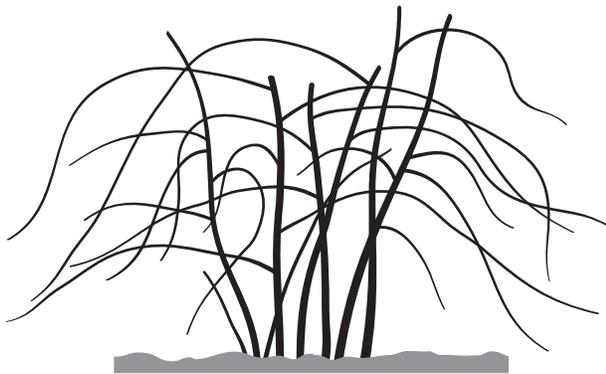


(A) Remove floricanes (F) immediately after harvest. Head primocanes (P) during the summer.

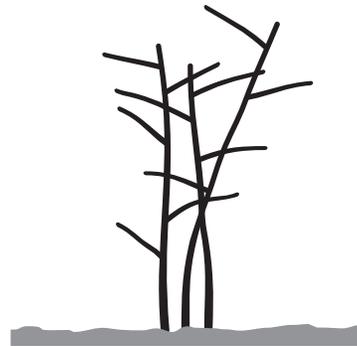


(B) Lateral branching as a result of primocane heading.

Diagram 3. Summer pruning blackberries, black raspberries and purple raspberries.

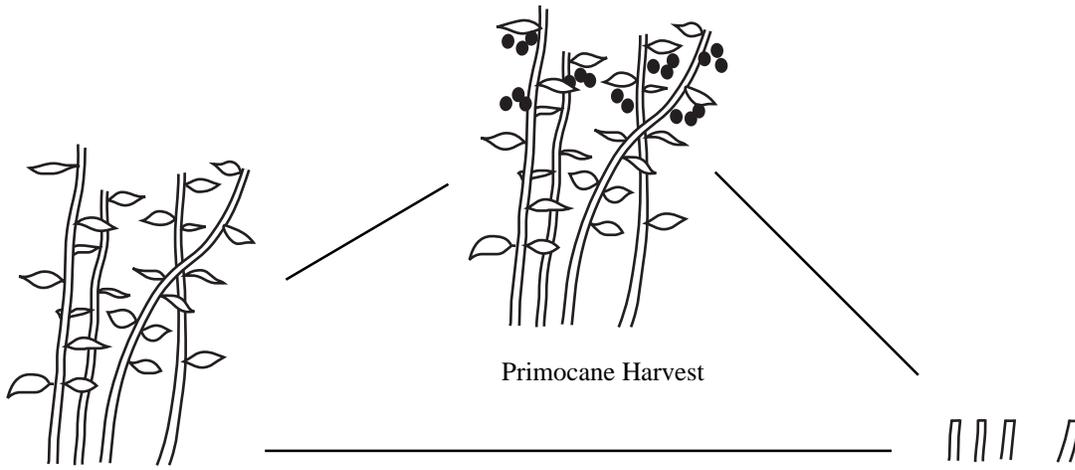


(A) Before dormant pruning



(B) Head laterals.
Remove laterals on lower 12 - 18 inches of canes.
Remove excess canes.

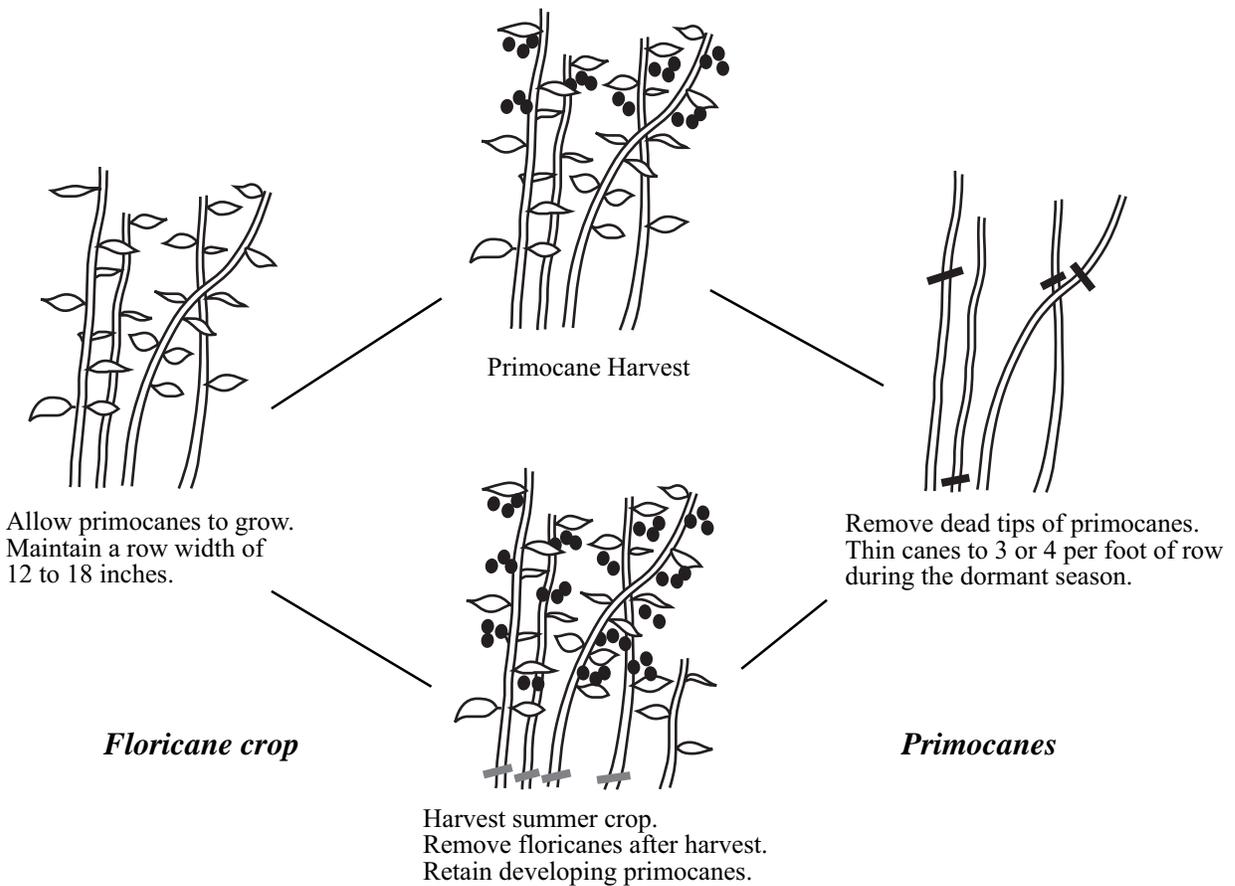
Diagram 4. Dormant pruning of blackberries, black raspberries and purple raspberries.



Allow primocanes to grow.
Maintain a row width of 12 to 18 inches.

Mow down the planting late
in the dormant season.

(A) Primocane crop

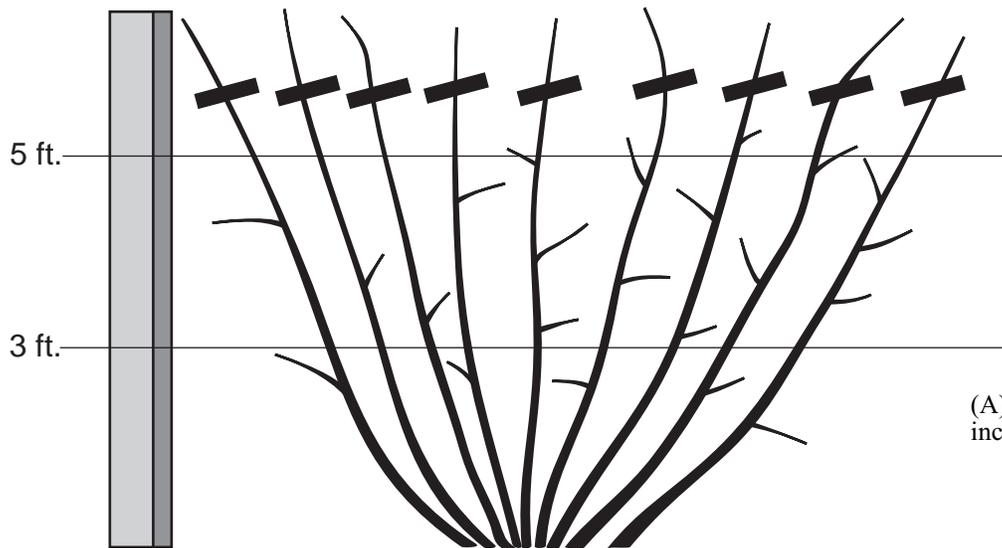


Allow primocanes to grow.
Maintain a row width of
12 to 18 inches.

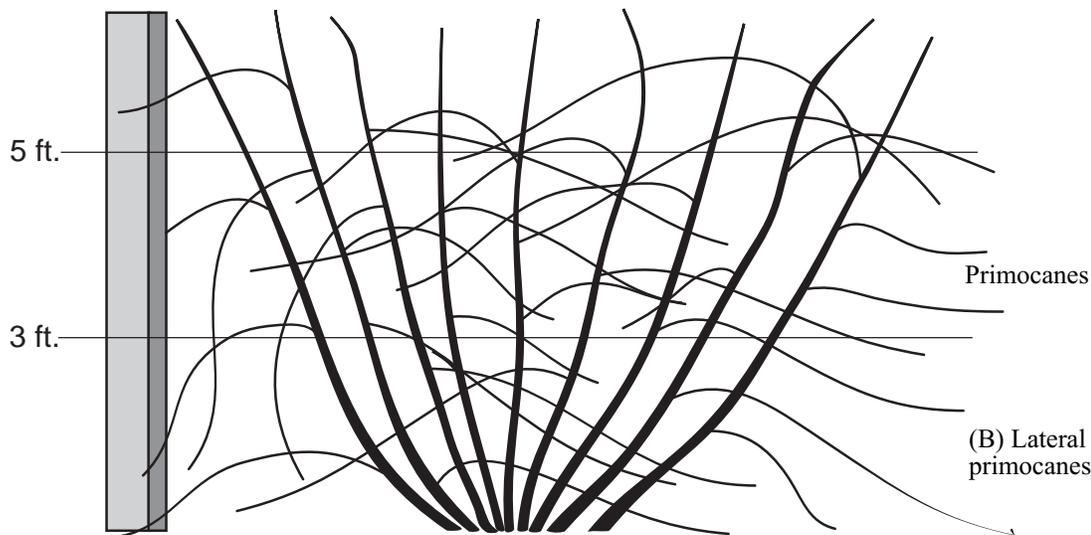
Remove dead tips of primocanes.
Thin canes to 3 or 4 per foot of row
during the dormant season.

(B) Primocane and floricane crops

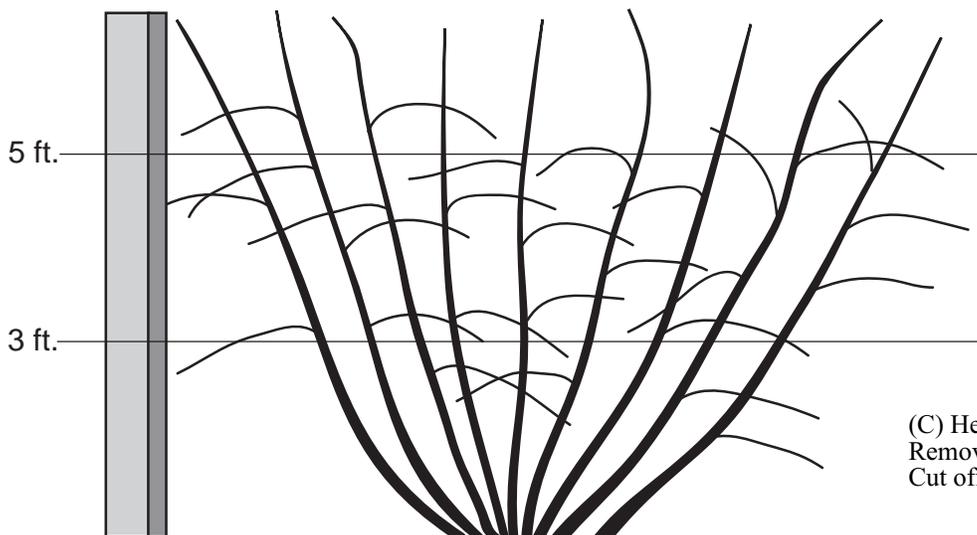
Diagram 5. Pruning everbearing raspberries for the primocane crop only (A) or the primocane crop and floricane crops (B).



(A) During summer, tip primocanes 4 to 6 inches above the top wire.



(B) Lateral branching as a result of tipping primocanes.



(C) Head laterals to 12- 18 inches in length. Remove laterals on the lower 18 inches of canes. Cut off weak and diseased canes.

Diagram 6. Fan system of pruning and training semi-erect brambles on a two-wire vertical trellis.

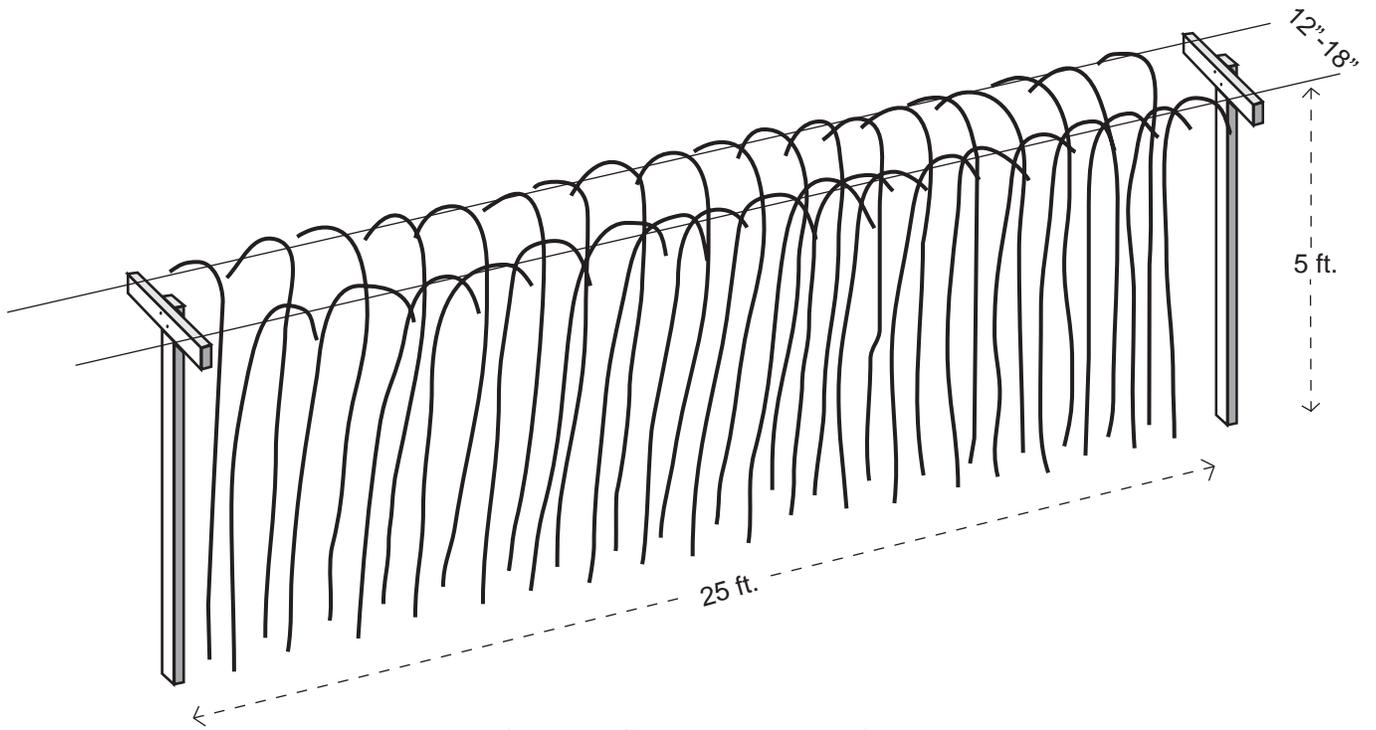


Diagram 7. Single cross-arm trellis.

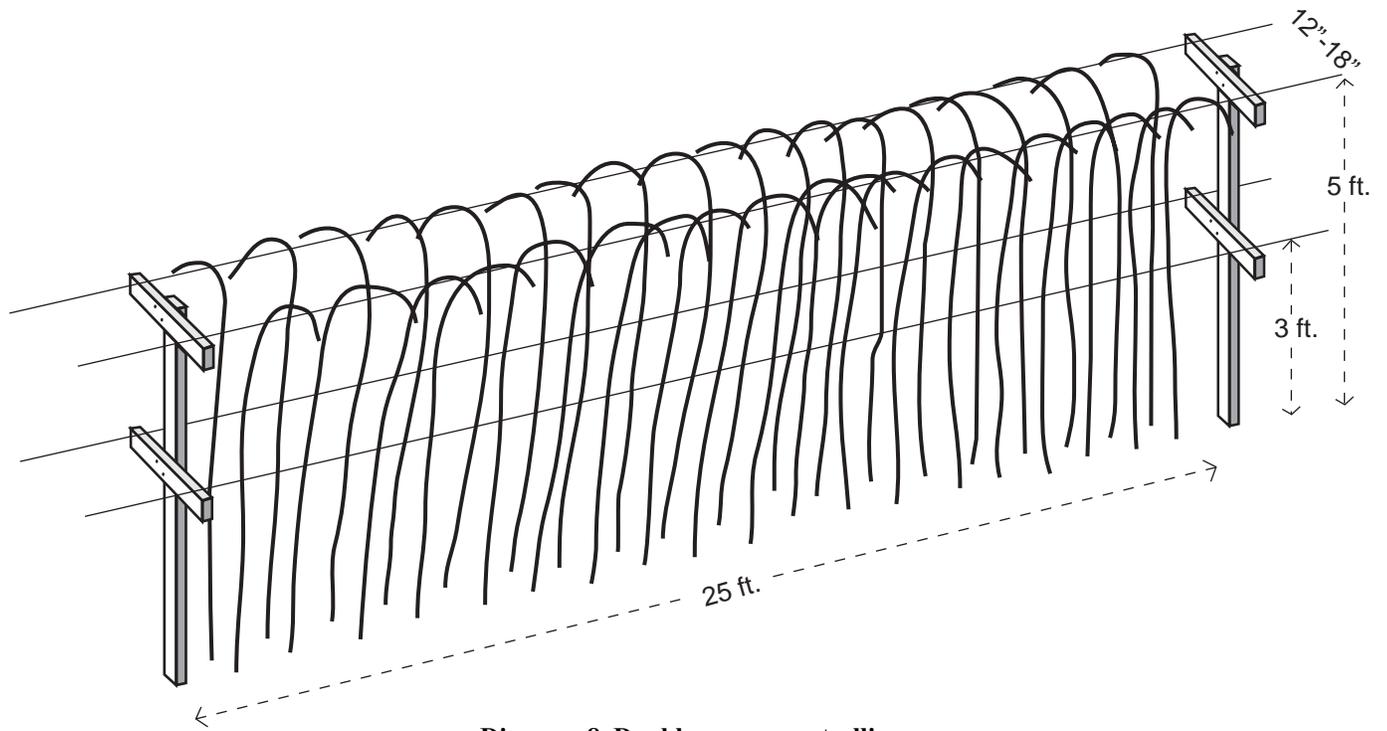


Diagram 8. Double cross-arm trellis.

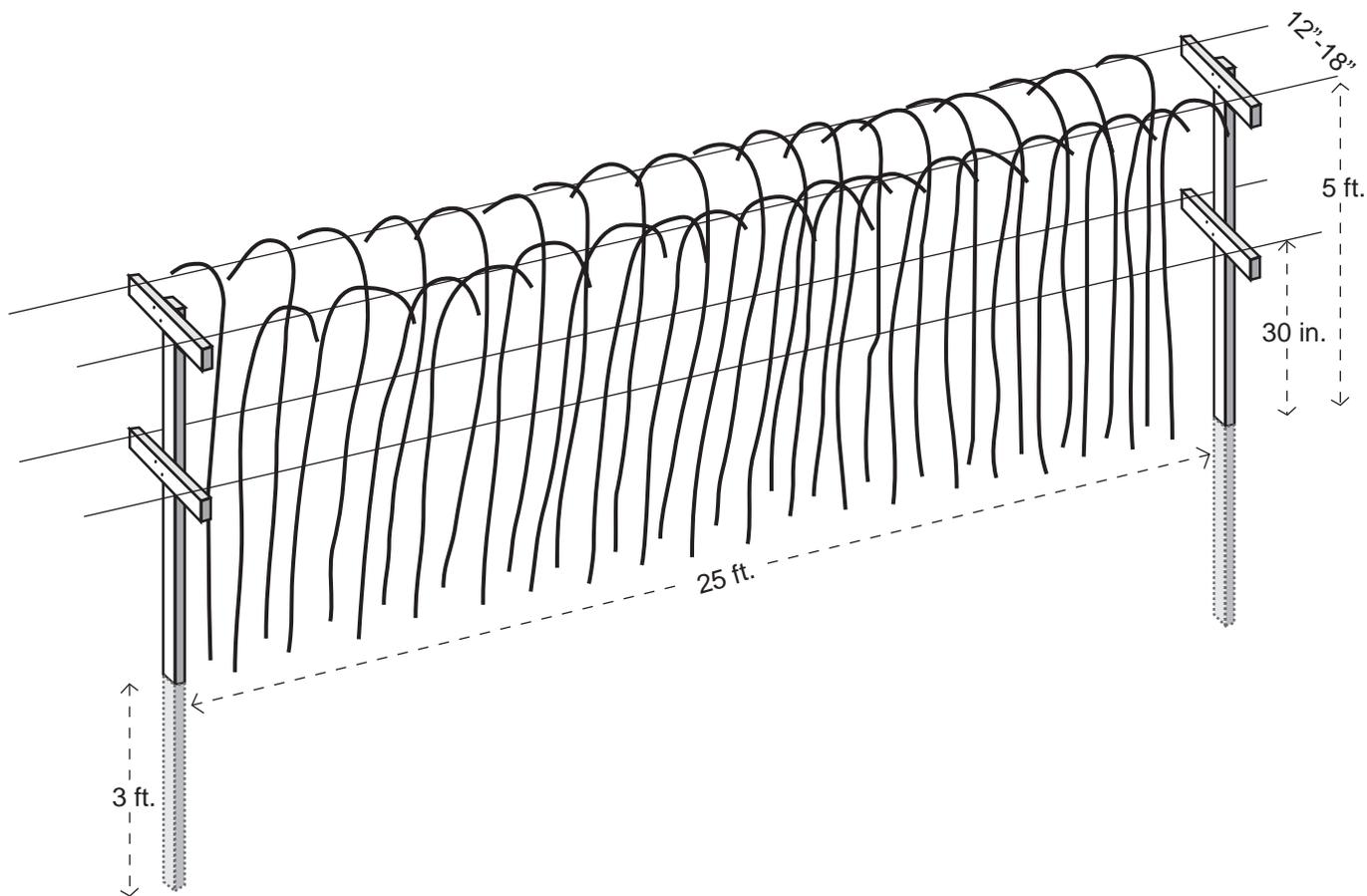


Diagram 9. Temporary trellis for everbearing raspberries.

SP 284-G(Rev) 09/14

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