

Planting and Managing Caneberries for Residential Production in Tennessee

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Blackberries and raspberries can be great additions to small-scale gardens or orchards because fruit can be harvested within 6 to 18 months after planting, and each mature plant can produce 5 to 10 pounds of fruit for fresh eating or preservation. The term caneberry is used to refer to plants in the genus *Rubus*, with blackberries and raspberries commonly grown in Tennessee. This publication, combined with the cultivar selection publication (W895-B), was developed to support good site and cultivar selection combined with good soil preparation and plant care, which will enable years of enjoyment and production from small-scale caneberry plantings.

Selecting Caneberries for Residential Production in Tennessee

Selecting caneberries that will fit both your needs and site requires knowledge about growth habit and environmental preferences. Caneberries have roots that are perennial but shoots that only live for two growing seasons (called biennial canes). Vegetative growth (stems, leaves) occurs with the first-year cane (called primocane). Then flowers and fruit are produced in the second year after the canes overwinter. After summer fruiting, the second-year cane

(called a floricane) dies. While this biennial process is typical, there are now many cultivars of both raspberries and blackberries that produce fruit on primocanes (see W-895-B). This habit is referred to as fall-bearing, everbearing, or primocane bearing. Selecting cultivars that fruit on primocanes can be an excellent method of extending the harvest period. However, summer temperatures in Tennessee may limit yield, so floricane bearing types usually have higher total production.

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Plant mgt		Remove remaining floricanes from previous year				Tip pruning of primocanes as needed			Remove dead or dying floricanes to reduce disease inoculum			
Nutrient mgt				First fertilization close to bud break		Second fertilization after harvest		Don't fertilize after early Aug.		Check soil pH, nutrient levels with soil test. Amend for pH if needed.		
Water mgt				Irrigate as needed to provide 1-1.5" week								
Pest mgt						Scout for insect pests and net if needed to protect fruit from wildlife						
Growth stage	Dormant		Breaking dormancy and bloom/fruit set	Fruit fill		Harvest on floricanes		Harvest on primocanes	Floricanes dying back			Going into dormancy

Another important environmental factor to consider is summer temperature stress that causes the decline of raspberries in many of the warmer areas of the mid-south. In Tennessee, blackberries can be grown across the state, but raspberries usually have the best production potential and longevity in the cooler, higher elevation areas. Because of the wider adaptability of blackberries, most of the management comments will be tailored to them in this publication. Most of the blackberries recommended for residential growers have an erect or semi-erect growth habit rather than highly trailing. These can be planted closer and are generally simpler to manage. Additionally, many are thornless, which promotes simpler management.

One final note about caneberries in Tennessee is that there are many rubus species native to our area, so wild plants can certainly be harvested. However, due to the opportunity to purchase and grow thornless types, primocane bearers as well as cultivars selected for high yield, large fruit size and high quality, our discussion here will focus on domesticated caneberries. Also keep in mind that wild blackberries and domesticated ones do not mix well due to the risk of disease and insect issues moving from wild to garden berries.

Preparing for Residential Caneberry Production

Sites for caneberry production require full sun (6 to 8 hours) with, ideally, a soil pH between 6.0 and 6.5. Productive plantings can be found in a range of soil types as long as there is good drainage. Low-lying or slow-to-percolate sites should be avoided. Soil pH adjustments and preventative weed control should be done weeks or months prior to planting. Fall soil testing and control of vegetation is ideal to prepare for an early spring planting. If more time is available prior to planting, a season or more of growing cover crops can reduce weed pressure while adding organic matter to the soil.

While most residential sites have limited options for fruit crop plantings, areas with a slight elevation will lower the risk of frost damage in spring. Some soil-borne plant diseases, such as *Verticillium* fungus, may be present in sites previously used for vegetable or strawberry production, so those should be avoided if possible.

Caneberries often perform well in raised beds. This includes permanent raised beds or containers, as well as berms that provide increased drainage and the opportunity to amend native soils, often with composted pine bark. Pine bark can be mixed with native soils or peat moss to improve the water holding capacity. Any raised bed or berm with significant amounts of pine bark will drain and dry out more quickly, so irrigation requires more attention than for plantings in loamy or clayey soil.

For the best selection of plants from high quality nurseries, it may be best to order several months in advance. Plants are available from traditional propagation methods, like rooted canes, as well as through tissue culture. Whatever the propagation method, selecting plants that have been screened for viruses can be a good step in avoiding viral diseases, which are some of the biggest threats to longevity and productivity. Additionally, removal of nearby wild caneberries before installing new plantings can help limit the spread of pathogens.

Caneberry Planting and Establishment

Early spring is the most common time for planting caneberries in Tennessee. Exact timing will depend on finding a time when the soil is not too wet to be well prepared and there is enough time to incorporate cover crops or other vegetation. Dormant bare root plants can be planted in early spring while tissue culture plants that already have green leaves are best planted after the chance of hard frost has passed.

Bare root plants will need to be planted in a way that enables roots to be spread out and then covered with a few inches of soil. Container grown plants or plugs should be removed from the

containers and slightly disturbed to encourage the roots to explore the soil. When planting, it is best to cover the surface of the media with soil (but not too deeply) to reduce drying out and water the plants in well.



Generally, there are grass aisles of 6 or more feet left between rows. The aisle can be up to 10 or 12 feet wide if larger equipment travels between rows. In-row spacing depends on the growth habit of the plant with most erect blackberries planted 3 to 4 feet apart in rows.

It is best to have irrigation and any ground cover in place at planting. Many growers use a woven groundcover to control weeds, and this method can be used successfully for smaller residential plantings. Heavy wall drip tubing can be placed under the groundcover, or individual emitters can be installed for each plant from a solid irrigation line. Organic mulches, such as pine bark, pine straw or hardwood can be used, but they will require good weed control before installing and more time spent in weed management after planting. Keep in mind that organic mulches should be kept on the surface and not incorporated to prevent interfering with nitrogen availability. Organic mulches should be applied 2-4 inches deep to support good weed control and moderate moisture and temperature. Monitor them closely to make sure that there is no matting or breakdown preventing water infiltration, which is most commonly an issue with hardwood mulch.

Caneberry Site Management — Water and Fertilizing

Soil test results will recommend how much (if any) potassium (K) and phosphorus (P) containing fertilizers need to be added to the soil and incorporated prior to planting. If soils are low in P and K, complete fertilizers may be used, but if K and P are sufficient, only a nitrogen container fertilizer will be recommended. An initial soil test is important because pre-plant is the only time fertilizers will be able to be incorporated in the soil. Some nutrients like P and some micronutrients as well as lime or sulfur to adjust pH do not move well in the soil. So, correcting pH or some nutrient issues becomes very difficult after the plants are established.

Nitrogen is usually applied in two applications (each about 0.5 lb N per 1000 ft² for a total of 1 lb/1000 ft²) about one month and 2 to 3 months after planting. Fertilizer is usually placed in a strip alongside the planting row, 6 or more inches away from the base of the plant. In years 2, 3 and beyond, 0.6 to 0.75 lb N per 1000 ft² (for a total of 1.25-1.5 lb N/1000 ft²) is generally recommended to be applied in the spring when primocanes emerge and in the summer after fruiting is complete.

Caneberries benefit from irrigation, especially during fruit fill, which occurs the week before ripening. Trickle or drip irrigation will avoid wetting the fruit and leaves to reduce disease risk. Irrigation also will enhance the emergence and growth of primocanes during dry periods. While an asset overall, it is good to closely monitor soil moisture because wet soils or areas of poor drainage can lead to root diseases and loss in caneberries.

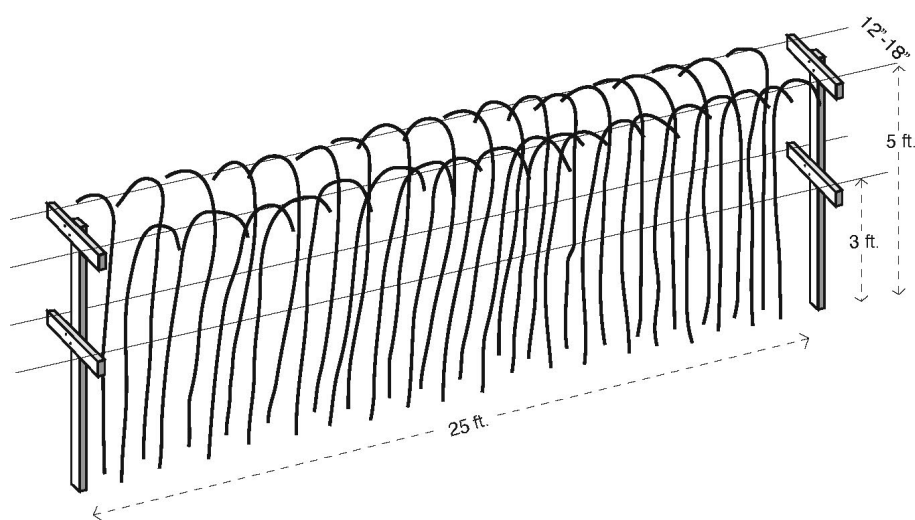


Figure 1: Double T-trellis (also called a cross-arm trellis) with the ability to support canes and separate floricanes from primocanes if preferred.

growth pattern in their first year. Once the primocanes grow 6 inches or so above the top trellis wire, tipping can begin. Summer tipping removes the primary growing point to encourage lateral branching on the cane and increase future fruit production. It also stops upward growth to keep the canes contained on the trellis. Summer tipping is best done when the tips are tender enough to be snapped by hand. Don't wait until they are so large as to require pruners because the cutting larger stems, later in the season can increase the risk of diseases like cane blight.

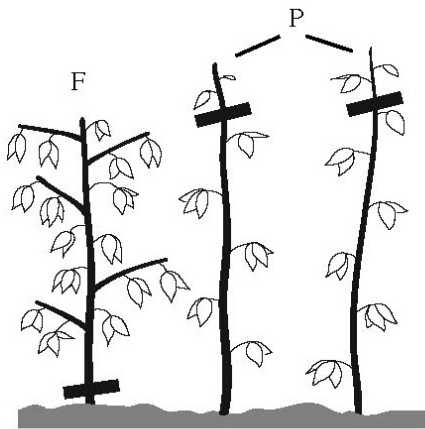
Caneberry Plant Management — Pruning and Training

Training is the term used to describe how canes are supported and managed—often with the use of a trellis. For erect or semi-erect blackberries and raspberries, a trellis system will enable efficient management and support good plant health. For trailing types, trellis systems are essential. In the residential setting, trellis systems also provide a cleaner and neater appearance and provide the best space efficiency. There are many styles of trellis possible, but one of the most common and successful for caneberries is the T-trellis which allows good support as well as air flow through the canopy (Figure 1). An I-trellis is a simpler to build version of a T-trellis with only one set of wires and no crossbar. However, it requires the canes to be kept close together and doesn't provide as much airflow or space for management.

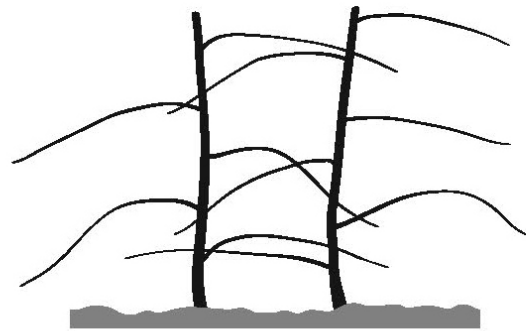
Pruning Floricane Bearing Types and Cultivars

In the first summer after planting, the canes will all be primocanes and no fruit will be harvested (unless they are a primocane bearing cultivar). It will be important to begin training these canes to the trellis. Often, vine clips are used to loosely secure canes to the upper trellis wires. Interestingly, even erect types often have a trailing

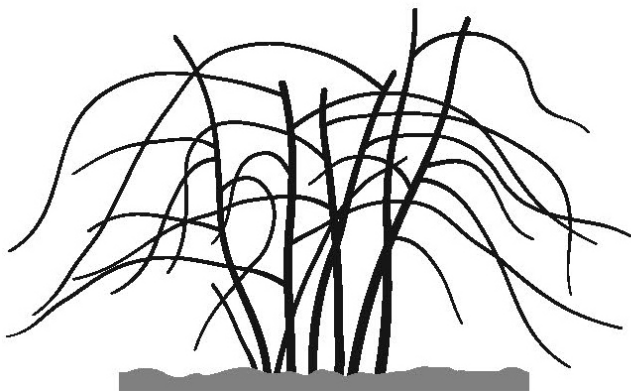
In the second year and beyond, the older floricanes and newer primocanes can be trained to either side of the trellis wires to simplify management. A similar process of training and pruning as described in year one is completed on primocanes. For the second-year canes (now floricanes), picking is done from June to July. Then, these canes may be removed after picking to reduce the potential spread of leaf or cane diseases. While some recommend removing floricanes in the dormant season, the reduced disease risk for plants in warm and humid Tennessee climates supports an earlier late summer or fall removal. Cut all floricanes as close to the ground as possible and remove the canes entirely from the planting area. In the dormant season, any long laterals on the primocanes overwintering to floricanes can be cut back to 8 to 12 inches. Additionally, thin the number of canes to 4 to 6 per linear foot of row and remove any low growing, weak, or diseased canes.



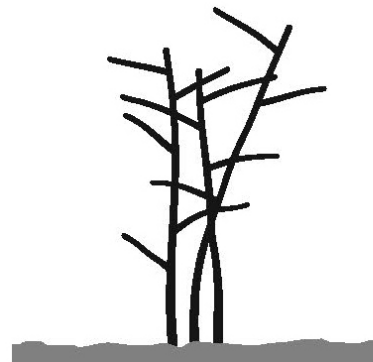
(A) Remove floricanes (F) immediately after harvest. Head primocanes (P) during the summer.



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



(A) Before dormant pruning



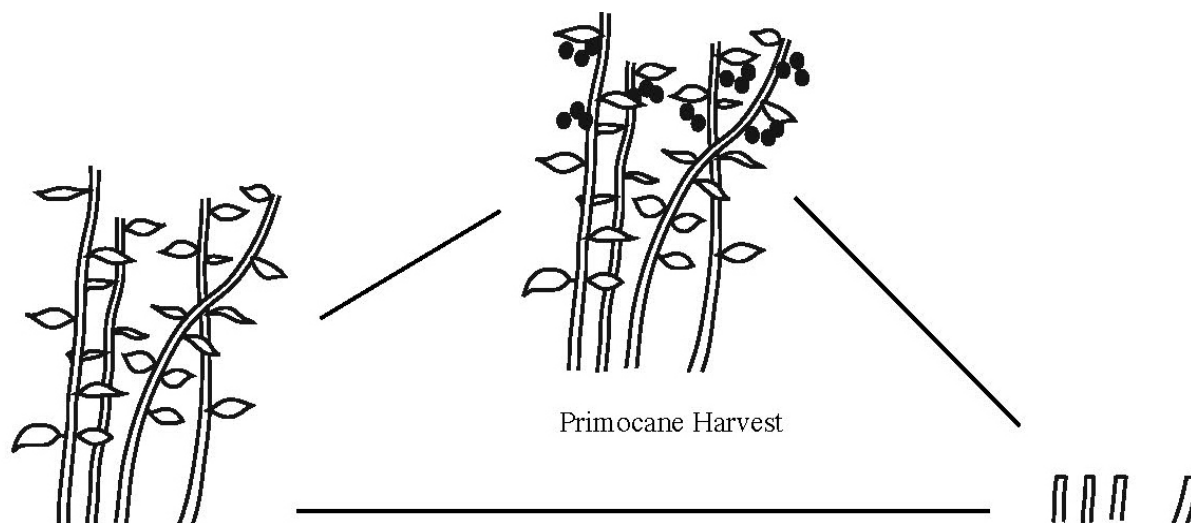
(B) Head laterals. Remove laterals on lower 12 - 18 inches of canes. Remove excess canes.

Figure 2: Overview of pruning through the first and second year of growth on floricanes bearing caneberries

Pruning Primocane Bearing Types and Cultivars

Primocane bearing types can be managed two different ways.

(1) Primocane bearing types can be managed so they produce only late summer and fall fruit on the primocane. In the spring and summer, the primocanes are allowed to grow but after primocane fruit are harvested, the cane is cut at ground level. This enables all canes to be removed each fall/winter to reduce management time as well as disease risk. This method is commonly used for fall-bearing or everbearing raspberries where the canes are cut or mowed right above ground level each winter. While simplicity and health are the potential benefits, this method of only harvesting on primocanes is likely to result in lower total yield, due to the summer heat and stress.



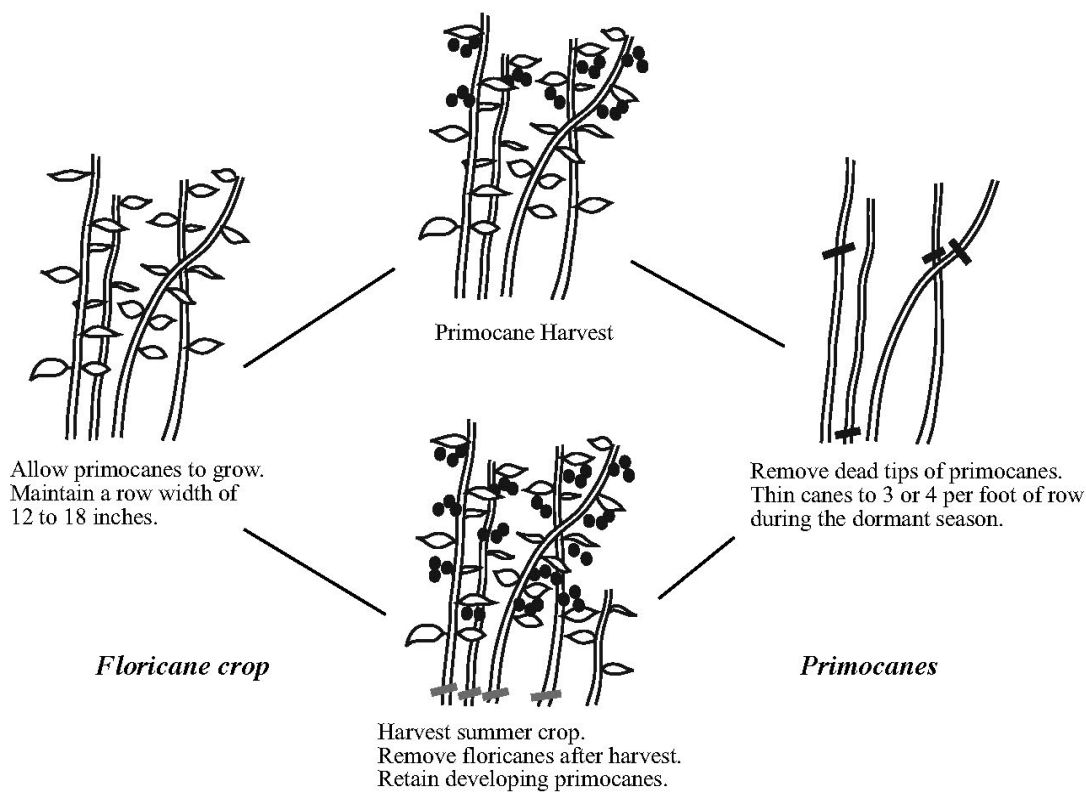
Allow primocanes to grow.
Maintain a row width of 12 to 18 inches.

Mow down the planting late
in the dormant season.

(A) Primocane crop

Figure 3: *Pruning method for primocane bearing cultivars that only produces one crop of fruit per year.*

(2) They can be managed to produce two crops per year, one in the early season and one in the late season. Primocanes can be trained as they grow in year one and then harvested when they produce late summer fruit on the top third of the cane. This fruiting portion of the cane can then be removed, and the cane can be overwintered and harvested the next year as a floricanes crop, as described above, with similar dormant pruning and sanitation measures.



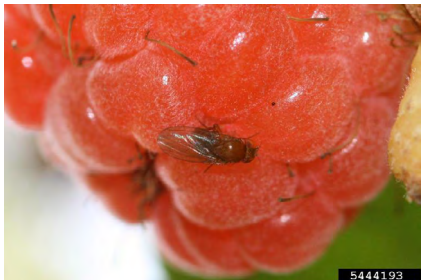
(B) Primocane and floricanes crops

Figure 4: *Pruning method for primocane bearing cultivars that produces two crops of fruit per year*

Caneberry Pest and Disease Management

A preventative spray program is not typically recommended for residential caneberries as selection, sanitation and cultural practices are often adequate control measures. Starting with disease free-plants and reducing exposure to wild caneberries will lessen the spread of certain diseases. Training and pruning to support airflow and light penetration into the canopy, as well as removal of diseased canes, will aid in controlling diseases. Tip pruning before canes are too large will support plant health by increasing lateral branching and yield while avoiding cane blight, which is more likely to be an issue when large stem cuts are made. Stems should be carefully inspected for blight and disease by scouting for tip or cane dieback or purple spots on canes. Some symptoms of wilting and galling on canes could be damage from cane borers, and those should also be removed. If diseases cannot be controlled through sanitation and cultural practices, spray materials may be considered using additional Extension resources such as PB 1622 (Disease and Insect Control in Home Fruit Plantings).

Leaf feeding insects, such as Japanese beetles or sap sucking mites and related pests are a possibility, but often the most damaging insects are those that feed on the fruit. Spotted wing drosophila fruit fly is becoming an issue for many small fruit growers, especially for soft skinned fruit that matures in mid-summer or later. More details on it and other pests and diseases of caneberries can be found in PB1622.

Common issues for residential caneberries	
Cane blight One of the most damaging diseases in caneberries is a fungal pathogen known as cane blight (<i>Leptosphaeria coniothyrium</i>). It enters the plant through wounds. These can be pruning wounds, or damage from cold, insects and other issues. Watch for small dark areas on the canes that may have a silver appearance or black bumps/dots due to spores. Careful tip pruning as well as sanitation pruning are important to reduce cane blight. Spraying may also be needed. This is not the only cane disease, so proper identification of cane issues is essential to develop a treatment plan.	 UGA5220084 Florida Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Bugwood.org
Rusts There is more than one rust disease that can affect our caneberries. Orange rust (shown on right) is usually seen early in the season and infects the whole plant (can show itself in weak plants) and requires removal. Wild caneberries in the area can be a source of the disease for our managed berries. There is another rust that usually occurs later in the season on canes and leaves and the rust can be more yellow than orange. Proper identification of the different types of rust is important because cane and leaf rust can be more successfully treated with sprays rather than plant removal.	 1634342 Penn State Department of Plant Pathology & Environmental Microbiology Archives, Penn State University, Bugwood.org
Rednecked and Raspberry Caneborer Caneborers are beetles whose larvae feed on young canes (primocanes) and cause swelling or galling or tip wilting due to cane damage. These galls or feeding sites can be close to the ground or higher on the plant and can weaken canes and make them unable to support future fruit loads. Pruning out canes with galls is an important sanitation element in fall/winter. Heavy infestations could also require spraying insecticides in summer when adults are emerging.	 00A3066051 Penn State Department of Plant Pathology & Environmental Microbiology Archives, Penn State University, Bugwood.org
Spotted wing Drosophila This non-native fruit fly has become one of the biggest pests of small fruits. The adult fruit fly shown on the right does not cause issues but does lay eggs in soft-skinned fruit that will become the larvae that feed on berries and infest our fruit. Being very timely in picking so there are not overripe and soft fruit on the canes for adults to lay eggs into is one of the best for reducing SWD issues in home caneberries. There are also spray options to control adult fruit fly populations, but timing is important to be sure the adults are present.	 5444193 Hannah Burrack, North Carolina State University, Bugwood.org

Harvest and Storage

It is best to harvest caneberries in the morning after the fruit has dried from any dew and before the summer sun adds heat. Blackberry fruit are picked with the core intact while raspberry fruit pull off and leave the core. Both fruit types are sensitive to damage during and after picking and should be placed in shallow containers rather than deeper buckets or bins. Once picked, the fruit should be moved from the sunlight and heat as soon as possible. Storage temperatures between freezing and 35 F are best. Fresh blackberries can store well for a week in the refrigerator if handled carefully and cooled quickly. They also can be frozen for use later.

References and Online Resources

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W895-B Selecting Caneberries for Residential Production in Tennessee: tiny.utk.edu/W895-B

UT Extension publication PB1622 Disease and Insect Control in Home Fruit Plantings: tiny.utk.edu/PB1622



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