



Growing BLACKBERRIES in California

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Blackberries are very adapted to California, because of their ability to tolerate a wide range of climatic conditions from extreme heat in the Central Valley to wet cool conditions along the North Coast. The cooler climate along the coast brings out and maintains the excellent flavor qualities and extends the ripening period. Although blackberries do well in a variety of soil types, they perform much better in deep well-drained, alluvial soils. In all locations, blackberries require frequent irrigations, so that they are always moist.

CULTIVARS

The two basic types of blackberries: are erect and trailing. Erect blackberries have stiff, arching canes that are somewhat self-supporting. Trailing blackberries have canes that are not self-supporting. On the East Coast, trailing blackberries are also known as dewberries. Blackberry plants live for many years; however, the canes grow one season (primocanes), produce fruit the second season (floricanes), and then die. Berries are borne on short lateral shoots produced on the floricanes. Listed below are important erect and trailing blackberry cultivars in California and their fruiting characteristics.



Thornless Evergreen left – Boysen Right

Erect Blackberries

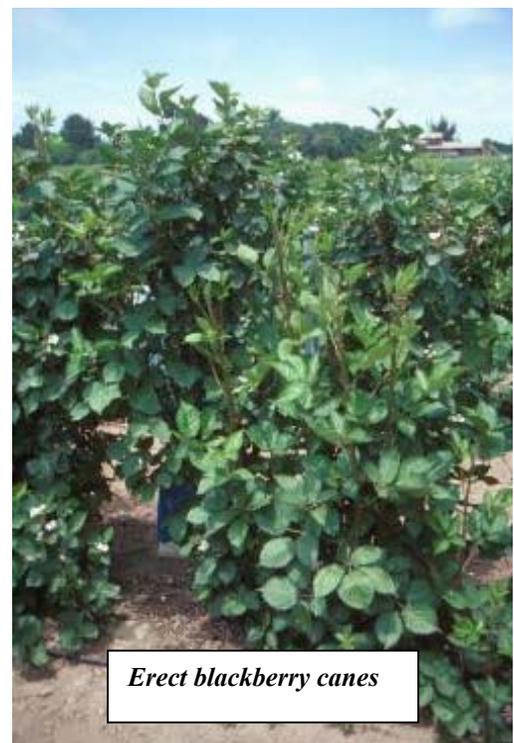
Black Satin: Mid-season; berries large, shiny black fruit, tart flavor, thornless, hardy, vigorous, good for processing.

Cherokee: Mid-season; berries medium large, black, firm, vigorous, thorny; tolerates heat.

Cheyenne: Early; berries very large, firm, attractive, vigorous, moderately thorny, hardy; tolerates heat.

Chester: Late; berries large, round, deep black, tart flavor; canes thornless, very vigorous and productive. Good processing berry.

Darrow: Vigorous, hardy, large thorns, productive over a long harvest season with large glossy fruit.



Erect blackberry canes

Hull Thornless: Mid-season to late; berries large, firm, good sweet flavor, thornless, vigorous, and productive.

Shawnee: Mid-season; long fruiting season; berries very large, shiny black, medium firm, vigorous, thorny, very productive; tolerates heat

Trailing Blackberry Cultivars

Boysen (Nectar Berry): Mid-season; berries very large, deep maroon, soft, excellent distinct flavor; canes thorny, but thornless types available; tolerates heat.

Kotata: Mid-season; berries large, glossy black, firm, good flavor, thorny, vigorous, productive.

Logan: Early; berries medium sized, long, dark red, soft, excellent, unique flavor; thornless type available.

Marion: Mid-season; berries large, bright black, firm, excellent flavor, thorny, productive.

Ollalie: Mid-season; berries medium to large, bright black, firm, good flavor, vigorous, productive.

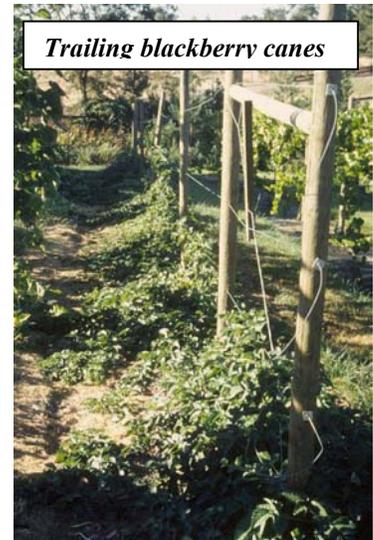
Silvan: Early to mid-season; berries large, black, medium firm, excellent flavor, thorny, very productive.

Tayberry: Early; berries large, medium red, soft, flavor distinctive, thorny.

Thornless Evergreen: Late; berries medium, dark black, firm, mild flavor, very productive, suckers from roots may be thorny.

Waldo: Mid-season; berries medium size, glossy black, firm, mild flavor, thornless, productive.

Young: Mid-season; berries very large, maroon, sweet, excellent flavor.



PROPAGATION

Blackberries are easily propagated as suckers, root cuttings or tip layering. Root cuttings are made in the Fall by cutting roots the size of a lead pencil or larger into three to six-inch lengths and storing them at 32 ° F in moist, but not wet peat moss. They can be planted at the nursery or directly into the field; the best time would be mid-Winter to early Spring.

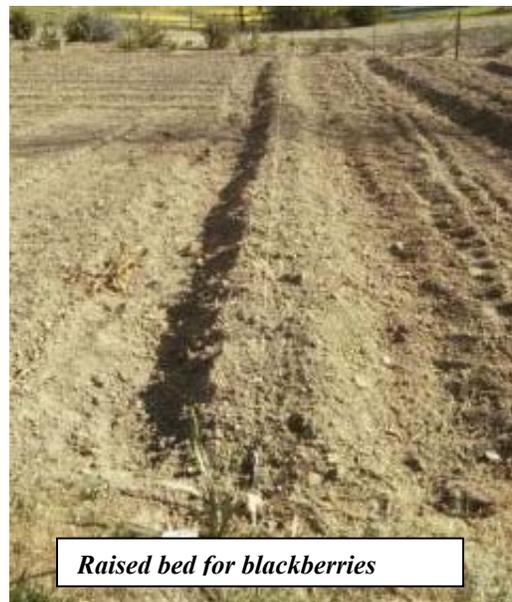
Another method of propagation is tip layering. Cover tips of canes with soil in late Summer or early Fall. Cut rooted tips from the cane and transplant them the following Spring. Although propagating your own berry plants is very easy to do, plants derived from a neighbor's canes could introduce unwanted root-rot organisms or viruses into your garden. It is best to purchase certified disease-free plants from a nursery.

SOIL REQUIREMENTS

Blackberries do best in well-drained sandy or loamy soils with a pH of between 5.5 and 6.5. A good supply of organic matter in the soil improves aeration and drainage and increases water-holding capacity. You may apply organic matter during the summer or fall before you plant. Incorporate about 1 pound per square foot (4.8 kg/sq m) of fully decomposed organic matter such as compost into the soil before making raised beds. Raw organic matter sources such as manure, straw, or peat moss can also be used, but should be allowed to decompose in the soil for several months prior to planting. Do not incorporate raw, high-carbon forms of organic matter such as sawdust, wood chips, or rice hulls. These materials should be used only as surface mulches to avoid tying up nitrogen during their decomposition.

RAISED BEDS

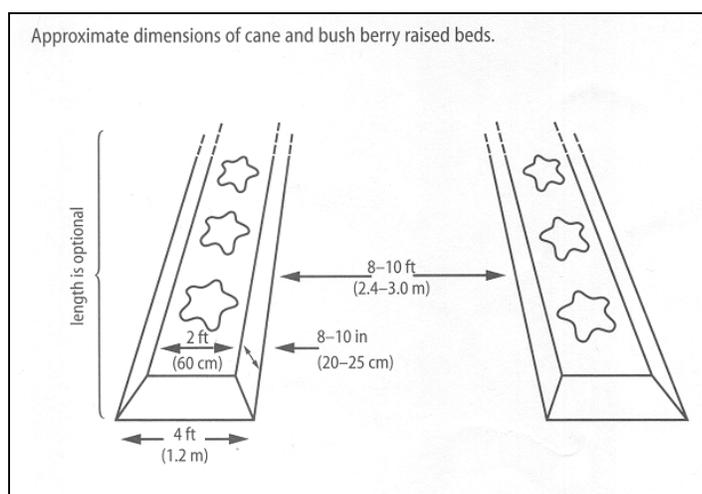
Raised beds improve the drainage and growth of blackberries considerably by decreasing the negative effects of heavy soils, heavy winter rains, or excessive summer irrigation. Raised beds are constructed by moving soil from the aisles (the area between the rows) to form beds 2 feet. (60 cm) wide at the top that widen to 4 feet. (120 cm) at the base. Beds are generally 8 to 10 inches (20 to 25 cm) high and can be as long as you desire. See figure below.



Raised bed for blackberries

PLANTING REQUIREMENTS

Plant bare root berries in the fall, winter, or as early as you can work the soil in the spring. Another option is to purchase green plants that are actively growing as plugs or in pots. These can be planted any time, taking care to make sure they are irrigated immediately after planting and very frequently thereafter if planted during the summer months. Dig a shallow hole just large enough to accommodate the roots, prune off any damaged root parts, spread the root mass, and set the plant at about the same depth it was in the nursery. Cover the roots with soil and press firmly to remove air pockets. Water the plants to settle the soil. Cut the canes on newly set plants to 6 inches (15 cm) at planting time. For best sun exposure, plant rows in a north-south direction, if possible.



SPACING

Space all cultivars 2 to 4 feet (0.6 to 1.2 m) apart in the row, leaving 8 to 10 feet (2.4 to 3 m) between rows. Blackberries tend to produce few root suckers, but new canes emerge every year from the crown area. Enough room is necessary between rows to allow for easy passage during harvest and for good sunlight penetration all the way to the base of the rows. If rows are spaced 8 ft. apart the canes should not exceed $\frac{3}{4}$ that height or 6 ft. If spaced 10 ft. apart the cans can be allowed to grow taller, up to 7.5 ft. which still allows for good sunlight penetration.

TRELLIS SYSTEMS

Trailing blackberries require a trellis system to support the fruiting canes the second year. Erect blackberries grow without support, but trellises will keep the planting neater and make harvest much easier. Therefore, it is advisable to trellis all blackberries. Set heavy end posts at least two 2 feet (60 cm) into the ground at each end of the row. Set lighter posts about 20 to 30 feet (6 to 9 m) apart in the row. After setting, the posts should be about 6 to 7.5 feet (1.8 – 2.3 m) tall.

A three wire trellis system is adequate with the top wire at approximately 6 feet (1.8 m), the middle wire approximately 4 feet (1.2 m), and the bottom wire at approximately 2 ft. (0.6 m) from the ground. Some growers use a two wire system spacing the wires at 3.5 ft. (1.07 m) and 5 ft. (1.53 m) from the ground.



FERTILIZATION

If you use manure, compost, or another source of organic fertilizer, apply it in the late fall or early winter. Apply approximately 50 pounds (22.7 kg) of an organic-type fertilizer per 100 feet (30 m) of row. Inorganic fertilizers should be spread over the surface of the soil in the row in early spring just when growth is starting. Apply 5 to 6 pounds (2.3 to 2.7 kg) of 20-20-20 fertilizer per 100 feet (30 m) of row. If plants lack vigor, apply an additional 1 pound (454 g) of ammonium nitrate per 100 feet (30 m) of row at bloom or midsummer, just prior to an irrigation.

IRRIGATION

Blackberry plants require approximately 1 to 2 inches (2.5 to 5 cm) of water per week from mid-May through October. It is best to keep the plants moist at all times without soaking and rotting the roots. Blackberries do better if the entire row is kept moist. It is not necessary to wet the area between the rows. For mini sprinkler irrigation, irrigate twice a week; however, during the fruiting stage or during windy and hot conditions, greater amounts and more frequent quantities of water should

Maxijet mini sprinkler on 4" riser with a spray pattern down the row only. Spaced every 4 ft. at 30psi.



be applied, possibly every day. When using drip irrigation, blackberries should be watered every day for 1 to 2 hours, longer in hot weather or when fruit is ripening.

PRUNING

No pruning is required during the first year, but removal of last year's canes plus trellising are required every year thereafter.

Erect Cultivars

Erect types produce stiff, upright new canes (primocanes) from the crown that arch over after they grow about 5 to 6 feet (1.5 to 1.8 m) long. During the summer of the second growing season, when the primocanes are approximately 3 feet (90 cm) tall, pinch off the top 1 to 2 inches (2.5 to 5 cm) to force more branching. These canes will produce fruit next year. Alternately, the canes can be left unheaded and wrapped around the wires for fruiting next year. Immediately after harvest until midwinter, remove the floricanes. These canes will eventually die anyway. Thin primocanes to three or four of the strongest canes per plant.



Trailing cultivars

In the spring, trailing cultivars produce primocanes that grow along the ground. Keep these trained in a narrow row beneath the bearing canes to prevent injury. After harvest, remove the floricanes. Thin the primocanes, leaving 6 to 12 of the sturdiest canes on each plant to bear next season. Wrap the primocanes around the trellis wires right after harvest and subsequent removal of floricanes. Wrap one or two canes at a time, in a spiral around the wires of the trellis, working each way from the plant. Top the primocanes of trailing berries if they grow beyond 10 feet (3 cm) long during the growing season.

PESTS (Weeds, Insects and Diseases)

The UC Cooperative Extension publications *Insect and Disease Management for Home Berry Plantings* (Barclay and Koehler 1982) and *Pests of the Garden and Small Farm: A Grower's Guide to Using Less Pesticide* (Flint 1998) provide information about pests of blackberries. Several key points are summarized below.

Weeds

Blackberries require a weed-free site in order to perform well. Before developing the site, control all perennial weeds with contact herbicides or diligent cultivation. Once the plants are in the ground, the best method of weed control is a heavy organic mulch. Apply mulch materials, such as bark chips, sawdust, peat moss, shredded bark, etc. to a depth of approximately 3 to 4 inches (7.5 to 10 cm) extending 2 feet (0.6 m) on each side of the row. Maintain the mulch throughout the life of the planting. If cultivation is necessary, do not dig very deeply because blackberry roots grow very near the surface of the soil.

Insect and Mite Pests

Red berry mite. Small mite that causes berries to ripen abnormally. Parts or all of the berry remain red and hard at harvest. To control, apply approximately 8 ounces (237 ml) of liquid lime sulfur per gallon (3.8 l) of water during the spring when leaf buds are ½ to 1 inch (1.2 to 2.5 cm) long. Be sure to achieve thorough coverage.

Spider mites. - Extremely small mites that cause stippled yellow leaves that eventually becoming totally yellow. Leaves turn dry and brown. Plant vigor and fruit production are noticeably reduced. To control, prevent mite buildup by reducing dust in the planting area and never allowing plants to become drought-stressed. Overhead watering will remove mites and wash off dust that has accumulated and created a haven for mite development. Apply a registered miticide or insecticidal soap if the water treatment is not sufficiently effective.

Raspberry horntail. - S-shaped, segmented worm (larval stage), up to 1 inch (2.5 cm) long, with white body and dark-brown head. It has three pairs of legs near the head end and short spines on the tail end. Horntail feeding causes tips of young shoots to wilt during the spring. Cutting open the affected portion of the cane reveals the worm and its tunnel, containing brownish granular frass. To control, remove and destroy infested canes. If the insect continues to be a problem, apply a registered insecticide immediately after bloom.

Crown Borers. Worms (larval stage) up to 1 inch (2.5 cm) long with whitish body and brown head. Plants lack vigor, portions become stunted and weakened, lateral growth wilts in spring, and the entire cane may die. Cutting open lower canes or the crown area reveals worms tunneling through plant tissue. To control, keep plants irrigated properly and growing vigorously, since borers are attracted to stressed plants. Prune out and destroy infested shoots and canes.

Diseases

Verticillium wilt. Fungus that survives and builds up in the soil on other host plants and then is transmitted to blackberry canes. It primarily affects floricanes, but rarely primocanes. Floricane leaves turn yellow, wither and fall, beginning at the base of the cane and progressing upward. They take on a bluish-black cast and die during the summer as fruits are maturing. Small groups of plants may be affected here and there. There is no cure for Verticillium wilt. Remove and destroy infected plants; avoid planting blackberries in soils formerly planted with other hosts of the fungus. Plant resistant cultivars such as Logan, and Ollalie.

Armillaria root rot. Fungus that survives in the soil for many years and attacks blackberry canes. The entire plant becomes weakened and can be killed quite rapidly once the first symptoms appear. White fungal growth between the bark and wood near the ground level is evidence of the fungus. There is no cure for Armillaria root rot. Remove diseased plants as soon as possible; do not replant berries in the affected area for at least 2 years.



Phytophthora root rot. Fungus that infects weakened roots as a result of excess soil moisture. In the Spring, plants fail to leaf out fully; small leaves turn yellow, and the entire plant dies. Interior wood on

canes in the root-crown area turns brown and rots. To control, plant berries on raised beds in deep, well-drained soils. Do not stress plants for water during the growing season, but be careful not to overwater plants in the summer.

Leaf and cane Spot. Fungus that survives on infected canes and leaves. Spores are dispersed by splashing water. Infection appears as small red-bordered spots with whitish centers on leaves and canes. Plants have reduced vigor and may lose some leaves prematurely, leading to sunburn of canes. To control, avoid overhead irrigation. After harvest and before fall rains, prune out and destroy old wood and apply fixed copper fungicides labeled for use on berries. A second application in January may be necessary in rainy locations.

Yellow rust. Fungus that overwinters on fruiting canes. Spores released from infected canes are spread by wind during spring and summer. Small yellow blister-like pustules appear in the spring, first on fruiting canes and then on new leaves. Canes dry out and crack, preventing proper ripening of fruit. To control, avoid overhead irrigation. Prune out and destroy diseased canes before fall rains. Apply a fixed copper fungicide in spring when new laterals are leafing out and again when flowers begin to open.

Orange rust. Fungus that is systemic, and remains in the host plant. Orange blister-like pustules cover the undersides of leaves in spring. Spores are released from the pustules and are spread by wind in the spring. Diseased shoots seem to recover by mid summer, but developing canes are smaller than normal and bear no fruit the following year. To date, no fungicides on the market are effective against this fungus. Remove and destroy infected plants, including roots.

Crown gall. Bacterium that survives in the soil and is spread by splashing water, pruning, and cultivation tools. Wart-like growths appear on the roots and crown area of canes. Severely affected plants become stunted. To control, cut out infected canes during hot, dry weather, and disinfect pruning tools before using on healthy plants. Do not purchase any plants that show evidence of crown gall symptoms.

Dwarf virus. Transmitted by aphids after feeding on infected plants. Symptoms include weak, spindly canes and leaves that cup downward and redden prematurely in fall. Plants become unproductive in 2 to 3 years, and berries crumble. There is no cure for dwarf virus. Remove infected plants immediately. Obtain virus-free plants from nursery.

Die-back. Physiological disorder. Canes and laterals leaf out after a delay, then wilt and die back at tips in early spring as first leaves are unfolding. This disorder may be associated with freezing injury, winter drought, or insufficient chilling. To control, maintain late-fall and winter irrigations so that plants do not become drought stressed.



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