

# Blackberry Production in New Mexico

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For over 2,000 years people have grown blackberries (*Rubus* spp.) for their edible fruit, for medicinal purposes, and as hedges to keep out intruders. Though more popular in New Mexico as a backyard small-fruit crop, commercial plantings can yield as much as 6,000 pounds per acre under good management. A planting can produce fruit for 15 years or more, but optimum production occurs between the third and eighth years.

## Botany

The blackberry, like the raspberry, belongs to a group of small-fruit crops called brambles. Brambles have perennial root systems and biennial canes. Canes produced during the first growing season (primocanes) produce fruit the following summer.<sup>1</sup> The canes then die back to ground level during the winter. Blackberry canes are generally prickly with small to large thorns, although some thornless cultivars have been cultivated for many years.

The blackberry is an aggregate fruit composed of numerous drupelets that are fleshy with hard seeds. Blackberry fruit differ from the raspberry fruit in that the core (receptacle) of the berry becomes part of the edible berry when picked. The receptacle remains on the cane of the raspberry when picked, resulting in a hollow berry.

## Types of Blackberries

There are generally three types of blackberry plants: erect, semierect, and trailing. Erect blackberries tend to have square-like stems, while trailing types tend to be more round. Erect cultivars have arched, self-supporting canes that can generally be grown without support, particularly if they are topped during the summer. (See “Training and Pruning,”

p. 3). Trailing types need to be trained to a trellis. Semierect cultivars fall in between but generally respond best to trellising.

Trailing blackberries, particularly western trailing blackberries, develop deep root systems capable of getting moisture from considerable depths, making them more drought resistant than most erect blackberries or raspberries. They are also capable of producing greater yields than erect blackberries. Erect blackberries, however, tend to be more cold hardy. Trailing blackberries tend to flower and ripen earlier than erect cultivars, which makes them more susceptible to late frosts. Trailing blackberries tend to produce smaller, more open fruit clusters that are sweeter but tend to bruise more easily than those of erect cultivars.

Most blackberry cultivars are self-pollinated, but yields and quality tend to improve with cross-pollination. At least two or more colonies of bees per acre are recommended.

## Cultivars

The following cultivars have shown promise in limited cultivar evaluations in New Mexico.

### Erect

‘**Brazos**’—early ripening; large clusters of fairly firm, slightly tart, juicy fruit; somewhat seedy; vigorous, thorny canes are very productive; fairly erect; resistant to anthracnose.

‘**Choctaw**’—ripens very early; early bloom susceptible to late frosts; good yields; fruit firm and medium sized; relatively small seed; canes very thorny.

‘**Navaho**’—excellent yields and flavor; very small berries; the first upright thornless blackberry.

<sup>1</sup>Second-season canes are known as “floricanes.”

‘Roseborough’—large, sweet berries similar to ‘Brazos’ but with improved flavor and firmness; ripens somewhat later than ‘Brazos’; canes hold up well in hot, dry weather; very thorny.

### Semierect

‘Black Satin’—ripens early to midseason; large, firm, glossy, black fruit; shine fades when mature; excellent flavor and yields; resistant to anthracnose and leaf spot; tolerant of mildew; thornless canes; excellent for backyard; more winter-hardy than other trailing cultivars.

### Trailing

‘Olallie’—large, shiny, firm, black berries; very vigorous thorny trailing canes; resistant to Verticillium wilt, but vulnerable to other leaf diseases; susceptible to later spring frosts.

### Site Selection

Blackberries grow best in the backyard in full sun, but will tolerate partial shade. Do not grow in heavy shade.

Blackberries planted on the side of a hill are less susceptible to late spring frosts than those planted in a valley. Blossoms may be injured at temperatures below 26°F. Temperatures below 20–24°F can injure fruiting canes in the spring.

Dry, hot winds in the spring can also damage fruiting canes and berries. Windbreaks on the southwest side of the planting may be helpful in commercial operations.

Selection of a commercial site should also be based on your potential market and labor supply. Pick-your-own operations should be located near large population centers.

### Soil and Site Preparation

Blackberries grow well in most types of soils but prefer deep, well-drained sandy loams with a pH of 6.5–7.5. In soils above 7.5 pH, plants can develop iron chlorosis. Avoid sandy soils that do not hold water well. Good drainage, however, is important because standing water can do permanent damage to blackberry

roots.

Blackberries respond well to soils with organic matter added before planting. Livestock manure can be soil-incorporated in the fall at a rate of 10–15 tons per acre (2–3 bushels per 100 square feet). Chicken manure can be applied in the fall at rates of 2–3 tons per acre. Large amounts of organic matter can be added the year before planting by incorporating green manure crops like Sudan grass in the fall, or winter wheat, barley, rye, or oats in the spring. Soils should be plowed about 9 inches deep, disked, and harrowed before planting. Fields should be irrigated before planting to insure good soil moisture.

Blackberry planting sites should be totally free of perennial weeds like bindweed. Bindweed seed can remain dormant in the soil for 20 to 30 years and is very difficult to control. Other perennial weeds like Bermuda grass and Johnsongrass should be controlled the year before planting.

### Planting

New blackberry plantings should be established from certified nematode- and virus-free plants purchased from a reputable nursery. Plants should be planted between late February and early April as soon as they are delivered. In bad weather, plants can be stored at 36–38°F for up to a month if they have not broken dormancy. Do not let the roots dry out. Plants can also be “heeled in” for storage in the garden. In a shaded area of the garden dig a trench deep enough to contain the roots. Spread plants along the trench with the roots down and cover the roots with moist soil.

If the plants are dry when they arrive, soak the roots in water for several hours before planting. Plant tops should be cut back to 6 inches long before planting. Tops can be used as handles when planting and to mark the location of the plants in the field or garden. Prune off any broken roots before planting. Individual planting holes can be made with a shovel or mattock. Commercial growers may wish to open a 3- to 6-inch deep furrow in the field with a tractor. Furrows should be made just before planting to avoid loss of soil moisture. Set new plants at the same depth or slightly deeper than they were in the nursery. Cover roots with moist soil, firm the soil around plants, and irrigate immediately.

The best spacing between rows varies between 8 and 12 feet depending on the training technique, width



**Figure 1. Fan type training system for blackberries.**

of equipment, and personal preference. The best plant spacing within rows for trailing cultivars varies between 4 and 10 feet, depending on the vigor of the cultivar. Erect blackberry cultivars trained to a hedge should be planted 2–3 feet apart. Vigorous erect or semierect cultivars that are trained as individual plants to a trellis or stake should be planted 4–8 feet apart.

Erect blackberries can be propagated from either suckers or root cuttings. Root cuttings should be 3–6 inches long and slightly less than 1/2 inch in diameter. Plant in trenches 2–3 inches deep in heavy soils, and 4–6 inches deep in sandier soils. Space plants 1–2 feet apart for hedge rows. Firm the soil over cuttings and water immediately. Root cuttings can be gathered from established erect blackberry plants early in the spring by digging up roots 2–3 feet away from the plants. Suckers can also be dug and transplanted in late fall or early spring without adversely affecting production of the parent plant.

Thornless blackberries should be propagated by “tip layering” in order to retain their thornless nature. Trailing thornless cultivars are often “chimeras,” meaning the outer tissue of cane and roots are thornless but the inner tissues retain thorniness characteristics. Injuring the roots will result in thorny suckers.

Tip layering is accomplished by digging a hole or trench 3–4 inches deep near the plant during the fall and inserting the tips of primocanes (first year’s growth) vertically into the hole or trench. Cover the tips with soil, firming the soil around the tips, then water. The following spring, rooted tips 6 inches long can be severed from the mother plant and transplanted to a new location.

## Training and Pruning

Both erect and trailing blackberries should be trained

to a trellis. Although erect cultivars can be grown without support, trellising will make cultivation and harvesting easier. Trellises for trailing blackberry cultivars should be erected the year plants are established in the field. Canes should be attached to the trellis during late winter or early spring. Handle canes carefully to avoid breaking or forming right angles, which could inhibit the flow of nutrients and water. Ends of canes can be removed without significantly reducing yields. Berry size may increase when half or more of the cane is cut off, but the number of berries may be reduced.

Trailing blackberries are often trained to a vertical two-wire trellis. Set support posts 16–24 feet apart in the row. Stretch two galvanized wires between the posts at a height of 5 feet (#9 gauge) and 3 feet (#10–11 gauge) above the ground. Staple the wires loosely to posts to allow for contraction during cold weather. The most common training system involves distributing individual canes along the wires in the shape of a fan (fig. 1). With soft twine, tie the canes to the wire, or interlock and twist them along the upper wire. Canes should be 6–8 feet long. Individual canes also be passed over the top wire, under the bottom wire, and over the top wire again in what is called a barrel-roll system (fig. 2). Canes are generally 10–12 feet long for barrel-roll training.

End posts for the trellis should be 4–6 inches in diameter and well anchored in the soil (2–3 feet deep). Stakes between the ends can be made of fence posts or 252 inch wooden grape stakes set at least 18 inches deep in the ground. Treat all wood posts with a wood preservative.

In colder areas of New Mexico, canes of trailing blackberries should be left on the ground during the winter and mulched with straw. Canes can be trained to the

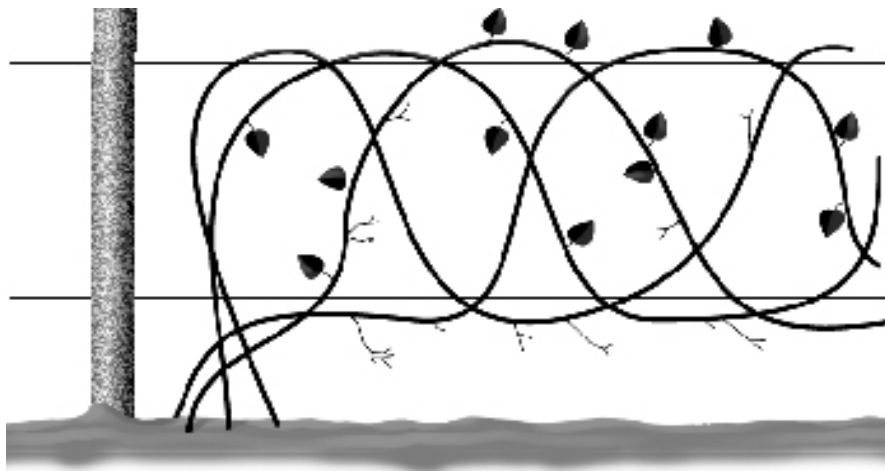


Figure 2. Barrel-roll training system.

trellis during the spring.

For erect blackberries, canes can be loosely tied to a single wire attached to posts at a height of 3 feet. Whether using erect or trailing blackberries, rows should not be over 300 feet long to allow pickers easy access in and out of the fields.

Remove all old canes at ground level after fruiting during the summer. Removing canes from the field or garden will help control many insects and diseases. Canes can be burned, or shredded and composted.

Erect blackberry cultivars should be topped during the summer when canes are 3 feet tall or slightly higher. Optimum height depends on the cultivar and vigor of the plant. Topping (also referred to as tipping) the canes forces out lateral branches, which bear fruit the following growing season. Topped canes will also grow stouter and are able to support greater fruit loads than untopped canes.

Laterals should be cut back in the spring to 12 inches. This will result in larger, better quality fruit than from unpruned laterals. Pruned laterals are also easier to pick from.

When pruning trailing blackberries in the spring, leave 6–12 strong canes per plant. Erect blackberries trained to a hedge should be thinned to 5–6 canes per linear foot of row.

## Cultivation

In young plantings, cultivation should be shallow (2–3 inches deep) but frequent to control weeds without disturbing the root systems of the plants. Unwanted suckers in alleys between hedge rows should be removed.

## Fertilization

During the latter phases of land (or garden) preparation, preplant phosphorous fertilizer should be broadcast and rototilled or banded into the center of potential hedgerows at a rate of 50–80 pounds per acre of  $P_2O_5$  (1–2 pounds per 1,000 square feet). Potassium should be applied only if a soil analysis indicates there is a potassium deficiency.

As new plants start to develop the first year, nitrogen fertilizer should be applied at a rate of 10–20 pounds per acre of elemental nitrogen ( $1/4$  to  $1/2$  pound per 1,000 square feet). Nitrogen should only be applied after the plants have had sufficient time to establish themselves (4–6 weeks). Earlier or heavier applications of nitrogen may burn young developing roots. Nitrogen fertilizers should be applied in a band 9–12 inches away from the plants and slightly incorporated into the soil (2–4 inches deep). Soluble fertilizers can also be applied through a drip system.

Phosphorous should be applied annually in the spring at a rate of 50–80 pounds per acre. Nitrogen should be applied at a rate of 50–100 pounds per acre (1 to  $2-1/4$  pounds per 1,000 square feet) in split applications: two-thirds in early spring before bud break and

a third after harvest. Soil incorporate all fertilizers in a band 2–4 inches deep and 12–16 inches away from the outside edge of the hedgerow. Soluble fertilizers also can be applied through a drip irrigation system.

Plants that show symptoms of iron or zinc chlorosis should be treated with foliar applications of iron or zinc sulfates. Plants also can be treated with foliar or soil applications of iron or zinc chelates. Foliar applications of these materials should not be applied during flowering because flowers may be burned. Growers and gardeners should follow the label rates for best results.

### Irrigation Techniques

Blackberries can be irrigated with flood, furrow, sprinkler, or drip systems. Furrow and flood irrigation are generally the cheapest ways to irrigate but are not appropriate for fields or gardens that are not level. Growers with poor quality water should use flood irrigation to prevent the accumulation of salts in raised beds.

Gardeners often prefer sprinkler irrigation due to ease of use. Sprinklers, however, often result in plants with more foliar diseases. Furrow, flood, and sprinkler irrigation techniques increase weed populations between hedgerows in contrast to drip irrigation.

Although drip irrigation is somewhat expensive, it's the most efficient way of applying water and fertilizer. Because water is generally confined to the root area, weeds are not as prolific in the alleys. Drip irrigation systems apply water more uniformly and require less labor but can be damaged by rodents and cultivation.

### Pest Control

Diseases represent the major pest problem with blackberries. The following diseases are a few of the more prominent problems found on blackberries in New Mexico.

**Verticillium** wilt is a soil-borne fungus that can be a problem in some areas of New Mexico. Fruiting canes often turn bluishblack when severely affected. Leaves turn yellow, and canes eventually die just before fruiting. To control this disease, plant certified, disease-free plants in a Verticillium wilt-free soil. Growers may

also choose to use preplant fumigation and plant resistant cultivars like 'Olallie'.

**Anthracnose** attacks both canes and leaves. It is characterized by small, purplish, slightly raised spots on new shoots. The oval-shaped spots eventually enlarge and develop grayish, sunken centers and raised purplish edges. The spots may later assume an irregular shape as they run together. Control it by using good sanitation practices and making applications of liquid lime sulfur in the late winter while the plants are still dormant.

**Fruit rots** are generally caused by the Botrytis fungus. Symptoms may range from discoloration of individual drupelets to a complete breakdown of the berry. Rotted berries are often covered with a gray or black mold. Berries may shrivel and become hard if they are left on the canes. Control fruit rot by using good sanitation and approved fungicides.

**Crown gall** is a bacterial disease resulting in warty galls on the roots or base of the plant crown. The disease is generally spread by mechanical injury to the plant through pruning and cultivation. Remove infected plants from the garden and avoid replanting blackberries in the same area. Pruning tools and other equipment should be disinfected routinely with a 10 percent solution of chlorine bleach.

**Nematodes** are microscopic parasitic worms that occasionally can be a problem, particularly in sandy soils. Nematodes cause weak cane growth, small leaves, and reduced fruit size. The foliage may also turn yellow and drop in hot weather. Fumigating the soil in the summer before planting is the most effective means of control.

**Insects** occasionally cause problems on blackberries. The most common problems are mites, thrips, aphids, leafhoppers, cutworms, and stink bugs. Most controls involve the application of a labeled insecticide. Check with your local Extension agent for proper identification and appropriate control measures.

### Harvesting and Storage

Begin picking early in the morning before air temperatures become too high. Pick uniformly firm, ripe berries with good color. Blackberries become fully black 2–3 days before they are fully mature. Shiny

blackberries turn a dull black color when they are fully mature.

Handle berries carefully when picking. Use shallow picking containers to avoid mashing the berries. Cool the berries as soon as possible because their quality deteriorates rapidly when they are held at temperatures of 75°F or higher for more than 24 hours. Berries may be stored reasonably well for 4–5 days at 32–35°F with a relative humidity of 90 percent.

Most cultivars should be picked every day for optimum quality. At least three full-time pickers per acre will be needed at the height of the harvest season. Harvest containers may be tied to the waist or hung around the picker's neck to free both hands for picking.



