Department of Horticultural Science

Horticulture Information Leaflet 200-B

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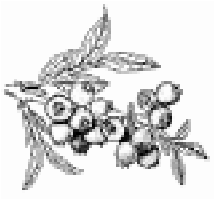

BLACKBERRY PRODUCTION IN NORTH CAROLINA

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Introduction

North Carolina production of blackberries has increased in recent years. Plant breeders have contributed to the increase in commercial blackberries by selecting adapted, highly productive, erect thorny and semi-erect thornless cultivars.

For a number of years, the most common blackberry cultivars grown in North Carolina were 'ThornFree', 'Smoothstem', 'Black Satin', 'Darrow' and a few plantings of 'Carolina' (dewberry). These cultivars were far from ideal. The semi-erect, thornless types, especially 'ThornFree' and 'Black Satin', are too tart for fresh use; 'Darrow' berries are small, and the sterility disease is a problem; and 'Carolina' dewberry requires extensive hand labor for tying, turning, and cane removal.

Problems with perishability and poor productivity were important factors contributing to the decline of the once prominent dewberry industry located in southeastern Piedmont counties of Moore, Richmond, Sampson, and Cumberland.

Today's blackberry plantings in North Carolina are mostly small and scattered. However, interest in cultivating blackberries is increasing because of newer USDA thornless introductions, 'Hull Thornless' (1981) and 'Chester Thornless' (1985), as well as the increasing popularity of the University of Arkansas erect thorny cultivars, 'Cherokee' (1974), 'Cheyenne' (1976), and 'Shawnee' (1984). These cultivars have shown distinct promise for local markets (pick-your-own and roadside) and home gardens. This leaflet contains current marketing, cultivar, and management information needed for successful blackberry production.

Marketing

Before planting, prospective blackberry growers should seriously evaluate the marketing opportunities for locally grown blackberries. In the mountains, for example, areas still exist where wild blackberry stands are so plentiful that it would be difficult to sell cultivated blackberries. Furthermore, the domesticated blackberries are distinctive in flavor, with some cultivars inferior to the accepted flavor of wild fruit. A ready market will develop only when people become familiar with the flavor and the need for more sugar when using some cultivars.

Blackberry Types And Cultivar Recommendations

Blackberries are usually classed as erect, arched self-supporting canes; trailing canes are not self supporting; and semi- trailing, thornless types such as 'Dirksen', 'Black Satin', and 'Hull' are completely trailing the first year with canes becoming more erect in

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subsequent years. The erect blackberries can be grown without support, but the trailing and semi-trailing types have weak canes which must be supported by trellises. The trailing types of blackberries, such as 'Carolina' and 'Boysenberry', are not hardy enough to withstand the more severe winter temperatures in western North Carolina. Unless indicated otherwise, the erect, thorny blackberries included in this section have statewide adaptation. Semi-trailing thornless blackberries should be grown in areas of the state where winter temperatures stay above 0^0F.

In Raleigh, North Carolina, the early erect types begin about the 1st of June; the early thornless types begin about the 1st of July. At the Horticultural Crops Research Station, Castle Hayne, in southeastern North Carolina, the average date of first harvest from thorny cultivars was June 10 during the years 1981 to 1985. Average first harvest of thornless cultivars during the same year was June 23. The harvest of erect blackberry types normally extends 2 to 3 weeks; it is unusual to pick any given thornless blackberry cultivars for more than one month, except perhaps in the mountains.

Yields will differ greatly, depending on blackberry type, cultivar, and cultural care. Trailing blackberries are typically low in production, (2,000 to 4,000 lbs per acre); yields of 10,000 lbs per acre with the erect thorny cultivar 'Cheyenne' have been attained in North Carolina; and yields in excess of 30 lbs per plant would not be uncommon with more productive thornless blackberries. A blackberry planting does not begin to bear full crops until the third or fourth year in the field. The planting may be productive for 5 to 12 years.

Special attention should be given to selection of cultivars with adequate hardiness for your geographic and climatic location.

The commercial grower's requirements are understandably different from the home gardener's; they are limited to proven varieties that are highly productive and/or disease resistant. Unfortunately, these are not necessarily those with the best flavor or processing quality. For the home gardener, the choice of cultivars is not as restricted. For this reason, information on blackberry cultivars that have shown promise in various parts of the state or may prove useful for special purposes is provided (Table 1).

Site And Soil Considerations

A location in full sunlight is desirable. Blackberries flower relatively late, from May onwards, and bloom over a long period. Frost is seldom a problem. If possible, avoid planting in a frost pocket; however, blackberries are among the few fruits that can be reasonably well grown on sites with poor air drainage. Blackberries grow in a wide range of soils and will tolerate slightly impeded drainage, although they will fare better in a well drained soil. Soil should be tested the season before planting with fertilizer and lime applied according to recommendation. Soil pH should be from 5.8 to 6.8. Perennial weeds and established sod should be thoroughly destroyed before planting.

Blackberries should not be planted immediately following potatoes, tomatoes, peppers, or eggplant, because this increases the risk of infection with verticillium wilt. A site previously planted to fruit crops such as peaches, apples, grapes, or brambles should also be avoided because of crown gall infection potential. The thorny erect blackberries are generally susceptible to double blossom disease and should not be planted near wild blackberries (at least 300 to 400 ft separation to restrict disease infection).

Planting

Plant Spacing — When planting blackberries in rows, allow at least 10 ft between rows to facilitate cultivation. Erect blackberry plants may be set as close as 3 ft in the row. Erect blackberry root cuttings are placed about 2 ft apart in a shallow furrow and covered with 2 to 3 inches of soil. Semi-trailing thornless tip-layer plants are quite vigorous and should be set 6 to 10 ft apart in rows. Less vigorous trailing types, like 'Carolina' dewberry, are set 4 ft apart in rows 8 ft wide for wire trellis and 6 ft wide for stakes. Align plants carefully in the row to accommodate the trellis, which will be constructed for semi-trailing blackberries.

Preparation and Planting — Preparatory plowing or subsoiling should be deep. Afterwards, the land should be left undisturbed to settle. Several rototillings, diskings, or harrowings before planting are needed to destroy weeds and loosen the soil. Tip-layered plants are usually available from November to March. New stock should be purchased from nurseries that have grown plants on fumigated land, well isolated from other brambles, sprayed regularly for

insect and disease control, and inspected by state officials. Early-spring planting of dormant stock is best. Late-fall planting is possible, provided the soil is in suitable condition. If the soil is wet, planting should be delayed until conditions improve. The growth of plants set late in the spring may be checked by drought or drying winds.

If the plants are dry upon arrival, soak the roots in water for several hours before planting or bedding in. If you do not plant immediately, heel in the plants by digging a trench deep enough to contain the roots. Spread the plants along the trench, roots down, and cover the roots with moist soil (be sure to keep the ground moist).

Pruning And Training

Growth Habit— Blackberry plants produce new shoots from the crown of the original set plant and possibly from buds formed on the roots (sucker plants). These shoots grow one season and produce laterals (side branches). The second year, small branches grow from the buds on the laterals. Fruit is borne on the tips of these small branches. After the 2-year canes have borne a crop, the cane dies (the canes are biennial). Understanding the blackberry growth habit is necessary for proper training and pruning.

Erect Blackberries

Erect blackberriesm such as 'Cherokee' and 'Cheyenne', send up root suckers in addition to new shoots that arise from the crown. If all root suckers were allowed to grow, they would soon turn the blackberry plantation into a thicket. During the growing season, it is desirable to allow the suckers to develop in a row approximately 12 inches wide, but it is very important to pull out suckers growing up outside the one foot wide row.

When the new shoots of erect blackberries reach a height of 30 to 36 inches, cut off the tips. This makes the canes branch. Tipped canes also grow stout and are better able to support a heavy fruit crop than untipped canes which must be supported by a trellis.

Winter prune the laterals to 12 to 14 inches for convenient harvesting and larger berries. In late winter, remove the remaining dead and weak wood. Leave healthy vigorous canes spaced about 6 canes per lineal foot of row.

In summer, as soon as the last berries have been picked, cut out all the old canes and burn them. Also, you may wish to thin new shoots at this time in addition to tipping, to force lateral branching.

Semi-Trailing Thornless Blackberries

During the first growing season, thornless blackberry shoots (a shoot is the current season's top growth) will tend to have a trailing habit and the shoots are generally left on the ground. Then, before bud swell, the second season bring the canes (a cane is a mature shoot after it has lost its leaves) up to the trellis wires and tie them individually with soft string. The lateral branches are pruned to 10 to 12 inches.

Often, only a small crop is available for harvest the year after planting. For this reason, some growers cut back to within several inches of the ground canes that would have otherwise fruited. This helps the plants become better established by preventing a severe drain on their vitality from fruiting, aids in reducing heat and drought stress, and favors the development of sturdier, more fruitful shoots.

In the second and succeeding years, new shoot growth is more vigorous and upright. These shoots should be tied to the trellis as soon as they have reached a height of 4 to 6 ft. Fan the canes out from the ground and tie them where they cross each wire. Avoid tying canes in bundles.

Prune in late winter or early spring. Laterals on canes should be pruned back to a length of 12 to 18 inches. Fruit from pruned laterals is larger and of better market quality than fruit from unpruned laterals.

In summer, as soon as the last berries have been picked, cut out all the old canes. Do not remove the new canes which have come up since spring, except to thin to 4 to 8 shoots per crown. The best shoots should be selected so that wires are well covered with evenly spaced shoots. Broken shoots or those too short or too weak for training should be removed.

Ordinarily, no further summer pruning is performed on thornless semi-trailing blackberry varieties. However, research has indicated potential benefits from periodic summer topping to encourage more lateral branching and

the development of shorter, more compact plants. Plants should be set closer than 6 ft in the row if this management plan is adopted.

A more detailed year-by-year schedule of pruning and training thornless blackberries is available in Horticultural Information Leaflet 200-C.

Trellis Support

After the first season, trailing and semi-trailing thornless blackberries should be trained on trellises to assure clean fruit, ease of picking, and help in disease control.

Many trellis arrangements and training methods are satisfactory. To construct a simple and effective trellis: Stretch 2 wires (gauge size 9 or 11) between line posts set 18 to 24 ft apart in the row. String one wire 3 ft from the ground and the other about five ft from the ground. Wires should be stapled loosely enough to allow for contraction in cold weather.

Trellises of this height require sturdy end posts, 8 ft in length, well braced, and anchored. Line posts should be about 7 ft long and 3 inches in diameter.

Fertility Management

Any fertilizer needs for the initial growing season should have been identified by soil tests and corrected during preplant land preparation. However, if the plants fail to initiate vigorous growth, additional nutrients can be applied in the spring. Use of nitrogen fertilizer should be avoided later than July since this may result in subsequent winter injury.

Fertilizer suggestions (Table 2 and Table 3) are presented for the producer's reference. These suggestions are intended for the "usual" situation, so modifications may be required when plants respond with either too much or too little growth of first-year canes.

Water Management

Young plants may need to be irrigated throughout their first growing season in order to improve plant survival and growth. Lack of water just prior to or during the harvest season can seriously reduce crops of blackberries. A shortage of water at this time will not only affect the current season's crops, but this shortage will also limit the production of desirable fruiting canes and so affects the following year's crop.

It is generally recommended that plants receive at least one inch of water during each 7- to 10-day interval during the growing season. The amount of water can be reduced, perhaps by 50% to 60% if trickle or similar irrigation systems are employed, since only the soil around the plant is wet. The lower-volume trickle method is especially well-suited to semi-trailing thornless blackberries where new growth is confined to the immediate area of the original plant crown (these blackberries do not spread by underground root suckers). The trickle irrigation method will also reduce the risks of fruit rots by avoiding the need to wet the foliage and fruit during application water. However, the trickle system will rapidly become clogged if the water contains impurities. Both well water and surface water from ponds or streams must be tested and the required treatment and filtration provided if the system is to function properly.

Mulches can be used but are often costly and scarce. Large volumes of material and labor are required, and some must be replaced each year. Mulches may introduce weed seeds, encourage rodent infestation and crown gall, and can be a fire hazard. However, weed-free mulches of straw or other suitable materials are of much value in aiding moisture retention and adding organic matter to the soil. They should be given serious consideration if blackberries are to be grown on lighter, low organic matter soils without supplemental irrigation.

Weed Management

The first consideration following planting should be to effectively control weeds. Blackberries may be shallowly cultivated during the first growing season, but care must be taken to prevent breaking the tender, newly emerging primocanes. Herbicides are also available which, when properly used, can be effective in weed control. Generally, blackberry plantings are clean cultivated between the rows by shallow tilling or disking. As the planting ages, blackberry roots will invade the area between the rows, and cultivating too deeply will injure roots and induce unwanted suckering between the rows. If sod is allowed to develop rows, it should be mowed several times during the growing season. To avoid soil erosion in Piedmont and Western North Carolina, a grass sod should be established

between rows, or a fall covercrop of rye planted for disking in the spring. If sod is used in the middles, a 4-ft-wide, grass-free weed- free strip must be kept in the plant row either by physical or chemical means.

Chemical weed control, used correctly, can be very effective. The choice of herbicide depends on soil type, weed species present, season of the year, pre- or post-emergence application, and bearing or nonbearing status of the planting. The correct herbicide must be used at the proper time or serious injury to the blackberry plants may result. Read the labels carefully. For more detailed information consult the current *North Carolina Agricultural Chemicals Manual* for the latest recommendations.

Insects And Diseases

Damage from insects and diseases can be kept at a minimum if these four general suggestions are followed:

- Remove all wild blackberry and raspberry plants in the vicinity of the field.
- Select high quality planting stock. Purchase certified stock whenever possible; be cautious about accepting plants from neighbors.
- Destroy plants in which disease appears, and prune outinsect infested canes and burn them.
- Remove old canes after harvest from the field, or thoroughly disk them under.

If a problem arises, then have the problem identified by the county extension office or a good garden store.

Harvesting

Harvest blackberries at least twice a week, but do not pick blackberries as soon as they turn black. It's better to wait 3 or four days and pick when the color has a dull appearance. Some general guidelines for harvesting blackberries are:

1. Pick in the morning while the temperature is still cool and the berries are firm.
2. Pick and handle the fruit carefully to avoid crushing or bruising.
3. Pick berries when fully ripened (dull black appearance).
4. Gently place the berries no more than 2 inches deep in berry baskets or picking containers to avoid further bruising.
5. Cool the fruit as soon as possible after harvest.

Table 1. Blackberry cultivar summary for North Carolina.

Variety	Ripe	Sz.	Flav.	Hardiness[1]	Yield	Vig.	Rec.[2]	Comments
Erect Types								
Brazos	V. Early	VL	Good	Low	Mod	HI	GAR	Lg. seeds, spreading plant, soft fruit
Cherokee	Mid	ML	Exc	High	High	MD	C/G	Firm berry, erect plant, res. Anthracnose
Cheyenne	E.mid	VL	Exc	High	High	HI	C/G	Firm berry, erect plant, res orange rust
Choctaw	V.early	LG	Exc	UNK	High	HI	UNK	Introduced 1988. Univ. Ark.
Comanche	V.early	VL	Fair	Mod	High	HI	GAR	Firm berry, lg seeds, res orange rust
Darrow	E.mid	ML	Good	High	High	HI	GAR	Firm berry, v. erect, virus susceptible
Lowden	Mid	ML		UNK	High	MD	GAR	Sweet, low acid
Navaho	Late	ML	Exc	UNK	Mod	MD	UNK	Also thornless. 1988. Univ. Ark.
Ranger	Early	LG	Fair	Mod	High	MD	GAR	Firm berry, sweet, wine use
Raven	Early	LG	Good	Mod	High	MD	GAR	Good processing, v. productive
Shawnee	L.mid	VL	Exc	UNK	High	HI	UNK	Rec trial for PYO; promising new var.
Semi-trailing Thornless								
Black Satin	E.mid	LG	Fair	Mod	High	HI	GAR	Very tart, not for fresh use
Boysenberry	E.mid	VL	Exc	Low	High	HI	GAR	Soft, almost seedless
Chester	Late	LG	Good	Mod	High	HI	UNK	Promising new var, rec trial for PYO
Dirksen	Early	ML	Exc	Mod	High	MD	C/G	Good flavor, standard variety
Hull	Mid	LG	Good	Low	High	HI	C/G	Sweet, soft berry, v. vig plant
Loganberry	Early	LG	Exc		Mod-Hi	High	HI	GAR Soft fruit, tart, good process
Lucretia	E.mid	VL	Good	Low	Mod	MD	GAR	Dewberry, requires stake/trellis
Smoothstem	Late	LG	Good	Mod	High	HI	GAR	Tart, lg seeds, processing use
Tayberry	Mid	LG	Exc	Low	Mod	MD	GAR	Raspberry x blackberry hybrid, v. trailing
Thornfree	Late	ML	Good	Low	High	MD	GAR	Large seeds, tart

[1] Only cultivars rated "high" for hardiness should be planted in the mountains.

[2] Recommendations for planting as based on fruit quality (size, flavor, firmness, seeds) and consistent high yields: GAR (garden only); C/G (commercial or garden); UNK (unknown adaptation).

Table 2. Fertilizer recommendations for erect thorny blackberries.

Time to apply	Method of application	Kind of fertilizer	Amount to apply per acre
Planting	None	None	None
Just after growth starts in spring	Banded at the side of the row (6 inches from row)[1]	10-10-10	200 lbs or approx. 5/lbs/100-ft row
Second year	Broadcast fertilizer alongside row in February	10-10-10	200 lbs or approx. 5 lbs/100-ft row
Every year thereafter	Sidedress after harvest to provide vigorous new canes.	Ammonium nitrate	100 lbs[2] or approx. 2.5 lbs/100-ft row

[1] Do not apply fertilizer in the furrow in which root cuttings or plants are placed.
[2] Increase or decrease this amount in response to cane growth.

Table 3. Fertilizer recommendations for semi-trailing thornless blackberries.

Time to apply	Method of application	Kind of fertilizer	Amount to apply per acre
Planting	None	None	None
Just after growth starts in spring	Spread uniformly in 4 inch bands around, but not closer than 6 inches from transplant	10-10-10	3 to 4 oz/transplant
Second year and each year thereafter in March	Spread uniformly in a 3-ft wide band over the row, or sidedress with 1/2 recommended on each side of the row. Sidedress bands should be 1 ft wide and 16-18 inches from row-center.	Ammonium nitrate	3-7 lbs/100-ft row

[1] The soil should be tested every 2 years for acidity, phosphorous, potassium, calcium and magnesium. If these tests indicate a pH of 5.7 or higher, and medium or high levels of the above nutrients, only nitrogen is needed on an annual basis. Lower pH readings, or low levels of individual nutrients, indicate a need for lime and/or a more complete fertilizer such as 10-10-10.