



## PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE.  
(HORTICULTURAL BRANCH).

# BLACKBERRY CULTURE.

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**C**LIMATIC conditions in British Columbia, and more particularly in the coastal areas, are very suitable for the production of high quality small fruits.

Good varieties of blackberries, when ripe, are attractive, bright, and glossy, with large rounded drupelets adhering firmly together. The flesh is soft with practically no perceptible core, and a flavour, while slightly acid, that is sweet and very pleasing.

Most varieties of blackberries commence to ripen after the peak of the raspberry picking has been passed and will continue to ripen well into the autumn.

The best varieties of either the upright or trailing types of blackberries when well grown are very desirable as a fresh-fruit dessert or when cooked in puddings, pies, or preserves. The blackberry is also in demand for the making of jam, jelly, and wine, and the increasing use of sharp freezing is extending the present market.

Blackberries, while not used in as large quantities as strawberries or raspberries, are an important part of the small-fruit industry of this Province. Approximately 500 tons of blackberries have been required annually for the commercial markets.

Blackberries grown under adverse conditions and of poor varieties produce an undesirable product and often result in reduced sales coupled with unfavourable comments.

Growers that have suitable locations should give favourable consideration to including a small planting of blackberries in

their small-fruit planting programme. This crop extends the small-fruit season and with good management will prove remunerative.

### DURATION OF PLANTATION.

Blackberries will not stand severe nor extremely cold winters, but in locations in the coastal areas well managed plantings have continued to be productive for over fifteen years.

### SOILS AND THEIR PREPARATION.

Moisture is an important factor in the production of blackberries. Lack of moisture during the maturing of the blackberry, in many instances, is responsible for the blackberries not attaining the size, colour, and full flavour so desirable.

Light sandy soils, unless humus in some form or other has been well incorporated into them, are not likely to be satisfactory for a blackberry planting. A soil varying from a sandy loam to a clay loam well supplied with humus will be most likely to prove satisfactory.

Drainage should be such that excess water will be carried away, particularly during the winter period of heavy rains.

In planning the planting programme for the farm the blackberry planting is considered permanent, and it will be an advantage to have the land in as good a condition as possible. The neglect of thorough preparation does not give the young plants a good start and often entails a great deal of expensive subsequent labour.

In planning for the blackberry planting, if possible use a piece of land that has been in a hoed crop the previous year. The land should be ploughed in the fall and left in a rough condition throughout the winter. In the spring the land should be ploughed as deeply as possible, disked and harrowed thoroughly.

### PROPAGATION.

The upright varieties are propagated from the 1-year-old suckers taken from around the bearing canes, and this also applies to the Evergreen. The Evergreen may also, like the Himalaya, be propagated by "tipping." The practice of "tipping" is similar to that followed in the propagation of loganberries. The tips of the current season's growth are covered with a little soil in the autumn and form roots. In the spring they are separated from the parent plant and are ready for planting out. If an increase in suckers is required, this may

be obtained by cutting the roots with a spade at a distance of from 8 to 10 inches from the plant. In certain cases propagation is done by root division.

## PLANTING.

Spring planting is usually advisable, although on the Lower Mainland and Vancouver Island it is possible to plant any time after the canes have matured in the autumn and the soil conditions are suitable. There is no advantage in autumn or winter planting beyond the saving of valuable time in the spring, whereas there is considerable less risk in spring planting.

Cultivated blackberries may be divided into two classes according to habit of growth—namely, upright and trailing. Eldorado and Erie are examples of the former and the Evergreen is the most common of the latter type.

The cane-growth of the upright varieties is rather stout and strong and when properly pruned the plants are definitely upstanding.

The cane-growth of the trailing varieties is very rambling and requires considerable training during the growing season.

In the case of the upright varieties the distance to plant is approximately 30 inches apart in the rows, with rows 8 feet apart. These are the distances used in commercial planting and have proven the most desirable. For home-gardens the distance apart for the rows may be somewhat reduced, but should not be less than 6 feet.

With the trailing varieties, such as the Evergreen and Himalaya, the distance between the rows should be at least 8 feet. In the case of Evergreens the plants in the rows should be set about 15 feet apart, and in the case of the Himalaya not less than 20 feet apart. The Himalaya variety, however, is seldom grown commercially.

The plants should be set fairly deeply. It is a good plan when commencing to plant to plough a deep furrow for each row. The young plants are then set well down at the planting distances and the crown covered to a depth of 3 or 4 inches.

Following planting, the canes or "handles" should be cut back to at least 8 inches. This enables the plants to become firmly established and maintains the balance between root and top which is so essential to satisfactory growth. The "handles" should be considered as markers for the plants and not as fruiting canes.

The number of plants required to plant an acre is obtained by dividing 43,560 (the number of square feet in an acre) by the product in square feet of the distance in feet between the rows multiplied by the distance in feet between plants. An acre to be planted 8 feet between rows and 30 inches between plants in the row would require 43,560 divided by 20 square feet ( $2\frac{1}{2} \times 8$ ) 2,178 plants.

### INTERCROPS AND CULTIVATION.

It is usually better practice not to grow crops in the established blackberry planting, except, possibly, during the first or second year. If the growth is not too luxuriant, crops requiring cultivation, such as potatoes, carrots, beets, cabbage, and spinach, may be grown to advantage the first year.

Cultivation as with all small-fruit crops must be thorough for the best results and as blackberries mature toward the end of the berry season the thorough cultivation assists in the conservation of soil-moisture.

### FERTILIZERS.

Blackberries are heavy feeders and often through lack of moisture and poor fertility of the soil the fruit is small and does not ripen properly.

Blackberries like other cane-fruits require fertilizing, and while the main requirements of nitrogen, phosphoric acid, and potash can be supplied by the use of commercial fertilizers, it is better practice to make applications of barnyard manures, or, failing this, to grow some cover-crop to be turned under and supplement with applications of commercial fertilizer.

If applications of nitrogenous fertilizers are too liberal cane-growth will be very rank, making handling and picking difficult, and the canes if not mature are more subject to winter-injury.

### SYSTEMS OF TRAINING AND PRUNING.

The systems of training and pruning in the case of the upright-growing varieties, such as Eldorado, Thornless, etc. are very similar to those practised in the growing of raspberries. Seven-foot posts are set in the row, 5 feet above ground and 2 feet below, every 30 feet. To each post and 5 feet from the ground is nailed a cross-arm at right angles to the direction of the row. The cross-arm should be about 18 to 20 inches long and be made of 2 by 4 or 1 by 6 lumber. To each end of these arms is attached a wire which runs the length of the row and is drawn tight. It

is between these wires that the canes are grown, and by them they are supported, in summer under the load of fruit and in winter under the load of snow.

In the summer the canes of the upright-growing varieties should be pinched back when they have attained a height of 3 or 4 feet. The removal of the growing tips of the new canes checks the terminal growth and encourages branching, resulting in a larger fruiting area for the following season's crop at a height more economical to handle.

It is necessary to go over the planting several times to pinch back the terminal growth to the desired height, but this summer-pruning also removes considerable strong cane-growth that would interfere with the picking of the ripening blackberries.



Showing two-wire system of training Evergreen blackberries.

In order to reduce the development and spread of diseases and insects it is often advisable, as soon as the picking is over to remove the old fruiting canes by cutting them close to the ground.

It is the custom of some growers to leave the old canes until the early spring when they start to prune the planting.

If the old canes have been removed in the fall, the spring-pruning consists of thinning out, shortening the laterals, and cutting back any canes not headed during the previous summer.

Canes arising away from the crowns should be removed as it is better practice to maintain the original crowns.

The number of canes to the hill will vary, but usually four to six strong, well-branched canes are kept. All weak or poorly

developed canes should be cut away. At this time the laterals should be shortened to about  $1\frac{1}{2}$  or 2 feet.

In the trailing varieties of blackberries, such as Evergreen, the most approved system of training is somewhat different. Posts are set in the rows 15 to 18 feet apart, or alternating with each plant. Cross-pieces are nailed to the posts and wires attached in the same manner as for the upright varieties, with the exception that each post has two cross-pieces, one at the top and one about 35 inches from the ground, and four wires, one attached at each end of each cross-piece, are stretched the length of the row. The wire used is generally No. 12, though No. 14 may be used for the upper pair of wires.

Spreaders made of pieces of wood 20 inches long and about 1 by 1, and saw-notched 1 inch from each end, are placed along both the upper and lower wires every  $2\frac{1}{2}$  feet or so. The young cane-growth is trained, half in one direction and half in the other, along the upper wires and the bearing canes along the lower wires. As the fruit is produced principally on 1-year-old growth, the bearing canes on the lower wires are removed after the crop is off, the cutting being made as close as possible to the ground. The removal of these old canes should be done as early as possible, but the general practice, as with the upright varieties, is to make one winter's job of the pruning and thinning and the cutting-out of the old canes. When the old canes have been removed the young growth is lowered from the upper wires and trained along the lower wires by weaving over and under the spreaders. At the same time this young growth is headed back to 10 or 12 feet, surplus weak canes are thinned out, and lateral growth shortened.

Another system, however, that is giving satisfactory results where the Evergreen is grown is what might be called the two-wire system. Plants are set 14 feet apart in the row, with the distance between the rows of 8 feet. Posts are set in the row every 28 feet, which brings two plants between two posts. On these posts are strung two wires, the upper wire being about  $4\frac{1}{2}$  feet above the ground, the lower 2 feet above the ground. On these wires the canes are trained—the bearing canes on the upper wire, the new canes on the lower wire, or vice versa. This system has the advantage of being less expensive than the one previously described.

## HARVESTING.

Blackberries require careful handling, consequently efficient management and careful handling of the fruit is a point to be stressed.

Blackberries are black a few days before attaining their full flavour. The degree of ripeness for picking depends upon the length of time required to reach the market. In picking for the home or near-by local market the berries are permitted to become more mature than for the more distant markets. Blackberries for shipment should be picked when thoroughly black and as soon as they separate fairly readily from the cluster.

The blackberry rows should be closely picked every other day to ensure high-quality fruit for the fresh-fruit markets. A few overripe berries in a crate soon detract from its appearance and mould is to be noted in a few hours.

The pickers should handle the fruit carefully and the containers when filled should be taken to a shady, cool place. Blackberries exposed to the sun after picking have a tendency to turn red and to taste bitter.

## VARIETIES.

*Eldorado*.—Fruit roundish to long, large, sweet, good quality. Plants are medium height, vigorous, hardy, productive, and ripen early.

*Thornless*.—Fruit roundish, medium size, fair quality, good shipper. Plants are medium height, vigorous, upright-spreading, hardy, productive, ripening mid-season. Grown principally in the Mission-Hatzic District.

*Erie*.—Fruit large, sweet when fully ripe, good quality. Plants are vigorous, medium height, upright-spreading, productive, ripening mid-season.

*Taylor*.—Fruit medium size, soft when ripe, good quality. Plants are tall, vigorous, very hardy, moderately productive, ripening late.

*Evergreen*.—Fruit large, fair quality, and a good shipper. The most common trailing variety grown, and fairly hardy on the Lower Mainland and Vancouver Island.

*Himalaya*.—Fruit large, sweet, soft, and of good quality. Plant is a very strong and vigorous grower of the trailing type. It is not usually grown commercially, but one plant is excellent for home use.

## INSECTS AND DISEASES.

(From Bulletin No. 68, J. W. Eastham, B.Sc., Provincial Plant Pathologist, Provincial Department of Agriculture.)

*Raspberry-cane Maggot (Phorbia rubivora).*—This is the larva of a small fly somewhat resembling a house-fly, but smaller. It attacks the young canes of raspberry, blackberry, and allied plants. The egg is laid in spring or early summer in the axil of a leaf (i.e., in the angle between the leaf and the stem) near the tip of the shoot. From this a small whitish maggot emerges which bores its way into the pith of the cane. It then eats its way down the cane for some distance, bores its way outwards until just under the bark, and from this point eats out a burrow right around the cane, effectually girdling it. As a consequence, the part of the cane above this point wilts and dies. The larva continues to eat its way down the pith and eventually pupates in the lower part of its burrow. The fly emerges the following spring.

*Control.*—Affected canes, as soon as the wilting is noticed, should be cut off well below the point where they have been girdled, and burned. The line of girdling can usually be detected as a bluish ring visible externally. This treatment carefully carried out will reduce the infestation the following season.

*Crown-gall.*—This may form typical galls at or below the level of the ground. In such cases there is no treatment except grubbing out and burning the affected plants. Another form of the disease appears on the canes, the Snyder variety being especially susceptible. Irregular excrescences break out on them, several times the diameter of the cane in thickness and extending for several inches. A succession of these may occur along the cane, possibly resulting from internal spreading of the disease from centres of infection. Affected canes should be cut out and burned.

*Leaf-spot (Septoria rubi).*—Appears as small brownish spots on the leaves, which, however, are rarely numerous enough to cause serious injury or to call for treatment. Bordeaux mixture is an effective preventive if it is found necessary to take measures against it.

*Anthracnose (Glæosporium venetum).*—This attacks also the raspberry and loganberry, the symptoms being much the same in each case. The chief injury is done to the canes, on which brown sunken spots appear. These are usually elongated in the direction of the stem and surrounded by a purplish area. In bad

cases they become confluent, thus giving rise to areas of considerable size in which the tissues are destroyed, and seriously interfering with the functions of the stem. Spores are produced in the centre of these spots. The disease also causes a spotting of the leaves, which, however, is of trifling importance with us. In the Pacific Coast States a serious rotting of the fruit is also reported, but this has not been observed here.

*Control.*—As soon as the fruit has been picked the old canes should be cut out and burned. Badly affected young canes should be removed at the same time. Spraying is reported to have given good results in some cases, but has not been very extensively adopted. Resin Bordeaux mixture, 4-4-40 formula, should be used owing to the nature of the surface of the cane, to which the ordinary mixture does not adhere satisfactorily. Spray first before the buds burst, then when the young canes are about 6 inches high, and again just before blossoming-time.

\**The Blackberry Mite (Eriophyes essigi* Hassan).—This mite feeds between the drupelets and the core of the berry, causing the development of a condition known as “the redberry disease of blackberries.” Instead of ripening in the normal manner, affected berries assume a red colour brighter than that of the unripened fruit, become hard in texture, and remain on the bushes until the old canes die during the winter. The “red-berry” condition may vary from a single red drupelet in a black berry to a single black drupelet in a red berry.

The most satisfactory control has been obtained by the use of two applications of lime-sulphur in the spring. The first should be applied in March or early April when the buds are beginning to open, and the second a little later when the fruiting arms are about a foot long.

Lime-sulphur (32 Baume) 1 gallon to 12 of water is recommended for the first spray and 1 gallon to 40 gallons for the second spray. Wettable sulphur, 2½ lb. to 40 gallons, may be used in place of lime-sulphur for the second spray.

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\* Extract from Bulletin No. 164, “Insects of the Blackberry, Raspberry, Strawberry, Currant, and Gooseberry,” by Arthur J. Hanson and R. L. Webster. Agricultural Experiment Station, Pullman, Washington.

Reported and confirmed by R. Glendenning, Dominion Entomologist, Agassiz, B.C.

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