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## SMALL FRUIT CULTURE IN VICTORIA.

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The small fruits dealt with in this article are known in England and the United States of America as bush fruits. These include the brambles (raspberry, blackberry, and hybrids) and the groselles (gooseberry and currants). The cultural methods and the climatic and soil requirements of other small fruits cultivated in Victoria have nothing in common with the bush fruits; therefore it was thought out of place to include them in this article.

Bush fruits can be grown, with proper care and attention, in a wide range of soil and climate; but, if grown commercially on a large scale, particular attention must be given to climatic and soil conditions. Although the requirements of these fruits are very similar, there is a considerable variation in the different species, and even in varieties of the same species, in respect to hardiness, susceptibility to injury by frosts, and in other ways. These variations will be considered when dealing with the different fruits in detail.

Most bush fruits thrive best in the cool mountainous and hilly districts of the State. Here the rainfall is usually good, and, providing the soil is of the right character, the plants grow luxuriantly and are fruitful. Although the brambles are not fastidious in their soil requirements, they prefer a rich, deep, and rather heavy moist loam. They will not thrive on waterlogged land, but a sufficiency of moisture is essential, otherwise plants will be stunted and unfruitful.

During the past few years there has been a considerable increase in the production of blackberries and the so-called hybrid loganberry, particularly the latter, but there has been no appreciable increase in the yield of other small fruits.

In the season 1909-10, according to the *Victorian Year-Book*, 325 bushels of blackberries were produced in commercial orchards, and a gradual increase in the production of this berry has been recorded till the season 1917-18, when the yield for the State reached 1,078 bushels. No record has been kept of the quantity of loganberries grown, but there has been an undoubted increase. Although the plantations are small—the largest known to the writer being  $3\frac{1}{2}$  acres—the popularity and adaptability of this berry to several commercial uses is certain to lead to an expansion in the loganberry area during the next few years.

### The Loganberry.

The loganberry was formerly thought to be a hybrid, *i.e.*, a cross between two species of the genus *Rubus*, but recent investigations appear to have proved that it is a variety of the dewberry—a trailing form of the blackberry.

In 1881, Judge Logan, of Santa Cruz, California, raised the loganberry from seeds of a dewberry called the auginbaugh. As this plant was growing in juxtaposition to that of an Antwerp red raspberry, and as the fruit of the seedling appeared to have the characteristics of both these plants, he concluded that it was a hybrid.

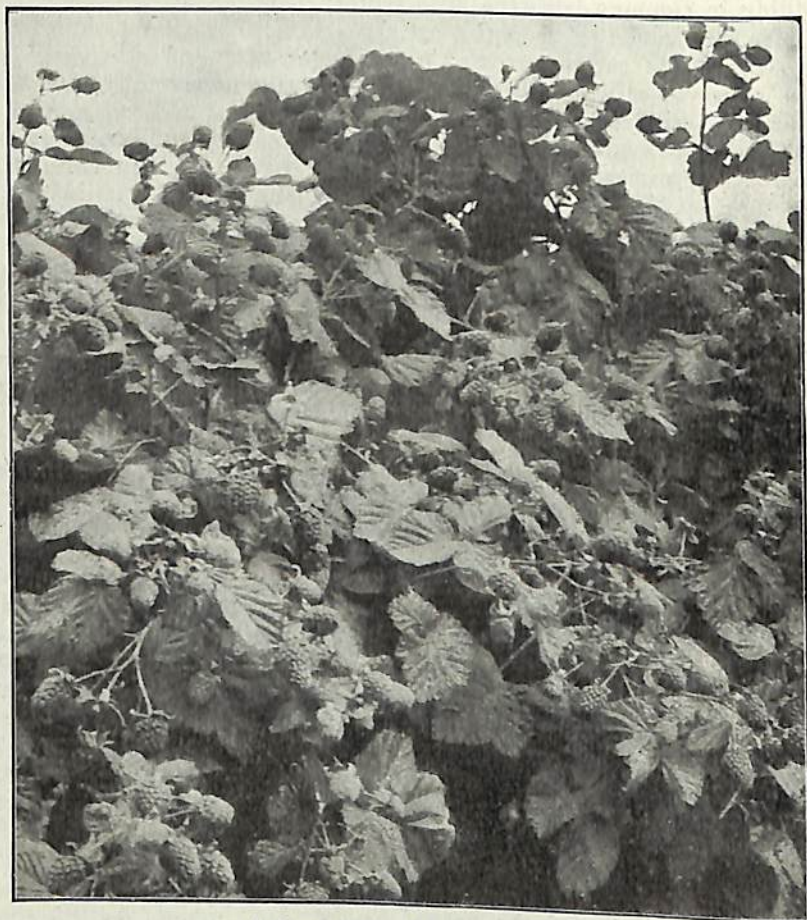
Now, however, there seems to be little doubt, as recorded in *Bulletin* 998, U.S.A., Department of Agriculture, that the loganberry is a variety of the dewberry, which grows wild on the Pacific Coast.



## EXTENT OF ITS CULTURE.

The loganberry has been cultivated in the southern districts of Victoria, particularly those within carting distance of the metropolitan markets.

The climatic conditions south of the Dividing Range are, speaking generally, suited to its cultivation; but, as the loganberry is susceptible to injury from frost, is liable to sun scald, and is injuriously affected by strong winds, there are localities where it could not be successfully



A Good Crop of Loganberries.

grown. The climatic condition of the mountainous and hilly districts of the eastern and north-eastern portions of the State should also be adapted to its cultivation. With an adequate supply of water it could doubtless also be profitably grown in the dry, warm northern districts of the State.

## SITE.

In choosing the locality for a plantation, contiguity of markets is of considerable importance. Growers within carting distance of the



metropolis or other populous centres are placed at a great advantage, for not only can they market the fruit more cheaply, but they can place it on the market in the best possible condition.

The ideal site for a plantation is one where the soil is a deep, moist, well-drained, rather heavy loam, and is naturally sheltered from strong winds. Many successful plantations are situated in rather low-lying land, which is naturally sheltered, but care must be taken to avoid gullies, where the air drainage is bad, and which, consequently, are subject to heavy frosts.

The loganberry is a comparatively early bloomer, coming into bloom from 20 to 30 days before kindred berries; therefore, the crop may sometimes be destroyed by a late frost, when the lawtonberry, for instance, escapes injury.

#### DRAINAGE.

Even in fairly well-drained land it pays to underdrain, but where the natural drainage is bad underdrainage is essential. Two-inch tile drains, from 20 to 30 feet apart, and from 2 ft. 6 in. to 3 feet deep, are recommended. In shallow soils with a heavy retentive clay subsoil the drains should not be more than 20 feet apart, nor more than 2 ft. 6 in. deep. In deep fairly porous soils the drains may be placed farther apart, and should be 3 feet deep. In some cases drainage of the wettest portions may be sufficient. When timber is available and cheap, a well-made wooden drain is effective, and will last as long as the plantation. In making a drain it is important that the clay taken out last should be returned first and firmly trodden down. Water should enter the drains from the bottom, not from the top as is often thought. The practice of placing brush or other rubbish immediately on top of the drain and filling in loosely, so that the water may enter from the top, is altogether wrong, and drains so constructed will soon silt up and become choked. The importance of good drainage cannot well be overestimated.

Briefly, it may be said that effective underdrainage increases the root pasturage by inducing plants to root more deeply. Well-drained land is warmer and drier in the winter, and cooler and moister in the summer, than undrained land. Underdrainage aerates and enriches the soil by increasing bacterial activity, upon which depends the liberation of essential plant foods.

#### PROTECTION FROM WINDS.

If there is no natural shelter, a breakwind of *Pinus insignis* or other suitable trees should be provided. Loganberries are injured by strong winds, and, although care in tying up minimizes the damage, they thrive better when sheltered.

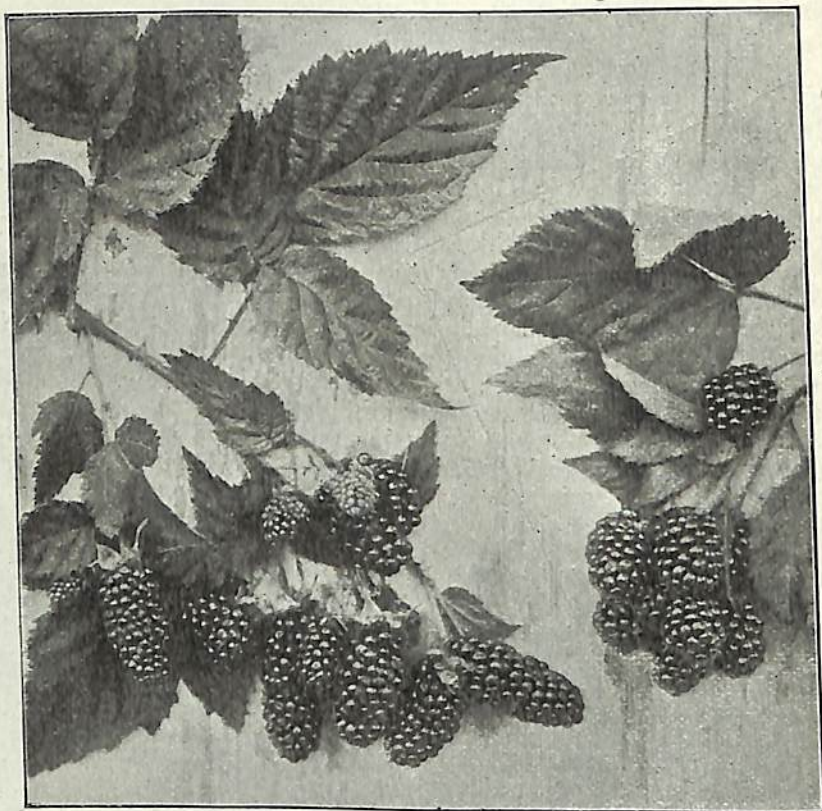
Hot winds also do much damage by scalding the ripe berries. Fortunately, however, only a small percentage of the crop is ripe at any one time, and, as the ripe berries only are injured, the loss is not great unless these winds recur frequently during the ripening season. Where there are strong prevailing winds, it is advisable to plant the rows parallel to the direction of the wind.

#### PREPARATION OF THE LAND.

If it is intended to plant in autumn or early winter the land should be deeply ploughed in spring and lie in a rough condition during



summer. This has the effect of sweetening the soil and making it more friable. It is advisable to plough as deeply as possible, provided that the subsoil is not brought to the surface. If the soil should be shallow and hardpan exists, it must be broken either by a subsoil plough or by a plough with the mouldboard removed following in the furrow of the first plough. If planting does not take place before spring, the preparation of the land can be delayed till autumn. The land should not be ploughed when wet; heavy land ploughed in a wet condition is seriously injured. A dressing of at least 1 ton of lime to the acre should be given in the autumn to land which is likely to be sour. Air-slaked lime is best for correcting acidity. Extra care in the preparation of land is well repaid by vigorous and fruitful plants.



**Loganberries and Lawtonberries.**

(The spray to the left is Mammoth Black Loganberry and to the right Lawtonberry.)

#### PROPAGATION.

The loganberry, as with all dewberries, propagates naturally from the tips. The tips of the canes should be covered with a few inches of soil at the end of the growing season—that is, about the beginning of May. In loose mellow soil the tips will take root readily without covering. If it is desired to produce many plants, the whole cane may be covered, when it will make roots at every node. The rooted portions



can then be removed to form plants. Another method is to pinch the strongly-growing canes about mid-summer. This will cause laterals to be produced at every node, and the tops of these will root readily. The plants obtained by the latter method are equally as strong and fruitful as those obtained from the tips of a single cane, but the cane itself which has produced these plants is not so fruitful in the season following. The loganberry can also be propagated by root cuttings and also by seed. Plants produced from seed, however, do not come true, and the fruit is invariably inferior to that of the parent plant. The single-cane plants are, on the whole, the best method of propagation, and, seeing that about 5,000 can be produced on an acre plantation, the other methods should rarely be necessary.



**Mr. Murfet's Loganberry Plantation at Ringwood.**

#### PLANTING.

In cool moist districts spring planting is recommended, but the plants should be set not later than mid-September. In the drier and warmer districts the plants may be set as soon as the tip plants can be obtained. This would probably be in early June. In the case of spring planting, the plants should be well established before the warm weather sets in.

The loganberry is usually planted 6 feet x 6 feet on the square system. Where the soil is rich and the growth likely to be vigorous, it is advisable to plant from 6 to 8 feet apart in rows 8 feet apart. This allows plenty of room for cultivation, which is desirable in the case of strong-growing plants.

When planting is done in spring, care must be taken to prevent the roots of the young plants drying out. They should be heeled in or covered with earth immediately they are received, and when taken out for planting should be protected from sun and wind by a wet bag. This is particularly necessary if the weather is at all warm.



The soil, having previously been worked to a fine tilth, the planting can be quickly done with a spade. The spade is thrust in close to the line on the farther side from the operator but pushed forward, the plant placed in position, which should be about 3 inches deeper than it previously stood, the spade withdrawn, and the earth firmed around the plant with the foot. When a large number of plants is being set, it is best to open out a furrow with the plough to the required depth. The plant is set in this, the fine soil placed around the roots and firmed, and the furrow filled by ploughing "on." A rod of the necessary length gives the distance between plants. As mentioned before, in districts where there are strong prevailing winds, it is best to have the rows running parallel with the direction of the wind.

#### IRRIGATION.

The loganberry delights in a rich moist soil, and, where moisture is deficient in the summer, it must be supplied. The yields of plantations near the metropolis have been increased 25 to 50 per cent. by irrigation, and all commercial growers in this district now irrigate. In the deep loams of Wandin district and those of a similar character, where the rainfall is good and the climatic conditions particularly favorable, irrigation is not so necessary, but even there, in some seasons, the plants are greatly benefited by irrigation.

The number of waterings depends largely on the season. It is important that the soil be kept moist during the time the fruit is maturing. Applications of water from every seven to fourteen days are necessary during a dry spell, according to the quantity of water used at each application and the nature of the soil. It is very necessary to cultivate the land as soon as practicable after each watering.

#### CULTIVATION.

For the purpose of conserving moisture, destroying weeds, and assisting in the liberation of essential plant food, tillage is, perhaps, more necessary in the case of the loganberry than with the larger fruits. The loganberry will not thrive nor be fruitful unless there is an ample supply of moisture in the soil. In the dry and warm districts of Victoria, irrigation and thorough cultivation are essential.

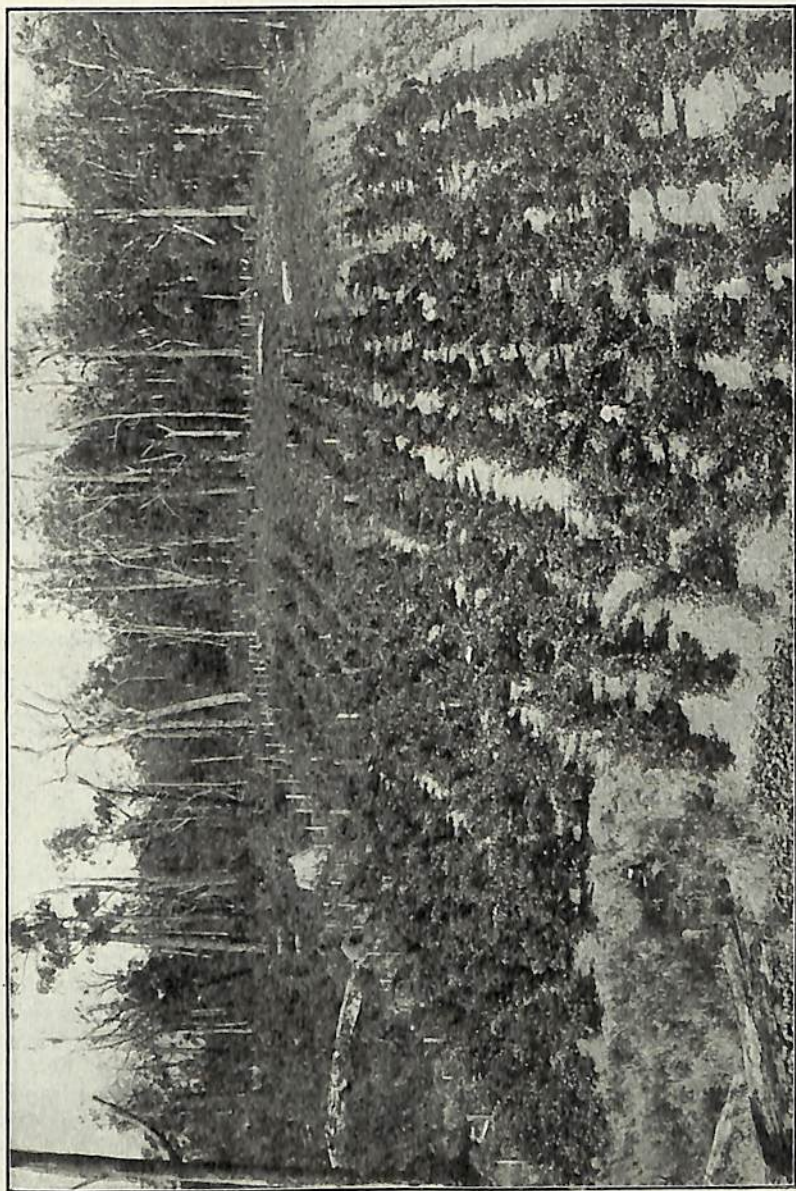
The implements required for cultivation depend to some extent on the nature of the soil. A single-furrow orchard plough with shifting handles is necessary to enable ploughing to be done close up to the plants.

The deeper the ploughing, in reason, the better, providing that the subsoil is not brought to the surface nor the roots of the plants injured. The deeper the soil mulch the better for conservation of moisture. The usual depth is from 5 to 6 inches, with a few furrows near the plants shallower if there is danger of injuring roots. If the plantation is ploughed deeply from the beginning, and worked regularly at that depth, there is little danger of doing damage to the roots.

Ploughing is necessary at least twice a year. In the autumn or early winter the land should be ploughed "on"—that is, the soil should be turned towards the plants, leaving a deep furrow midway between the rows. The land should lie in a rough condition during winter, and



as much of the surface as possible exposed to the ameliorating influence of sun, air, and frost. In spring, the ploughing should be "off," or away from, the plants. The centre furrow is filled by this ploughing



A General View of Mr. Harold Godwin's Berry Plantation at Wandin.

and the land left level. It is usually necessary to harrow before the spring ploughing in order to put the land in proper condition for this operation.



As mentioned before, heavy land should not be worked when too wet. For this reason the autumn ploughing should not be delayed too long nor the spring ploughing done too early.

The summer cultivation consists of harrowing and working with the spring-tooth cultivator or one-way disc. Before the trellises are erected in the first year of planting, cross working can be practised if desired. Later, when the canes grow long and spread in every direction, cultivation may be done only in one direction between the rows.

The canes, as they grow, must be trained along the ground in line with the rows so as to be out of the way of the cultivator. The different systems of training the canes and trellising will be dealt with later.

The frequency of summer cultivation is dependent, chiefly, on the season. Cultivation is necessary after heavy rain or irrigation to provide an earth mulch to prevent evaporation and the growth of grass and weeds.

More frequent waterings will not compensate for neglect in cultivation. Inexperienced growers sometimes fall into this error.

Regarding the necessity for destroying grass, &c., by cultivation, recent experiments conducted at the Woburn Experimental Fruit Farm disclosed the fact that grass, &c., not only robs the soil of moisture, but does much more harm by producing a toxin which is very harmful to the cultivated plants. The aeration of the soil by cultivation oxidizes the toxin and renders it harmless. More than this, what was previously a toxin becomes on oxidization a plant food. It was also found that on land well underdrained the toxin was mostly washed out of the soil, and consequently its injurious effects considerably lessened.

The chemical condition of a soil being dependent on its physical condition, it follows that thorough cultivation is of vital importance.

*(To be continued.)*

