

Diseases of the Loganberry

susceptible to several virus and fungus diseases Logan is immune to Verticillium wilt and powdery mildew

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Greenhouse and field tests carried on for four years have shown that the Loganberry is not affected by Verticillium wilt, the most serious disease of the Boysen and Young varieties. The Logan therefore can be grown on land cropped previously to tomatoes, potatoes or other susceptible crops without danger of wilt losses, and can even be intercropped the first year with tomatoes. The Loganberry is also immune to powdery mildew, a serious disease of the Boysen and Young varieties in the coastal berry growing districts of California.

The Loganberry was originated in 1881 in Santa Cruz County by a successful planned cross between the Aughinbaugh, a variety of the Pacific Coast wild blackberry, and a European red raspberry, probably Red Antwerp. The variety flourished after its general release about 1893, and became the leading blackberry in California by 1920, but began to decline sharply before 1930.

It now seems certain that a virus disease *dwarf* was chiefly responsible for this decline. In recent years there has been a

gradual replacement of the Logan by its thornless form, a highly productive sport which is not affected so severely by the dwarf disease.

Dwarf is by far the most serious of the virus diseases so far recognized on the Logan. Dwarf-infected plants can be recognized by their weak, spindly canes, and by leaves which cup downward and reddened prematurely in the fall. Infected plants become completely unproductive in two to three years time. Fortunately this disease does not affect the thornless Logan as seriously as it does the thorny, and the disease has never been observed in the field in the Boysen and Young va-

rieties. To reduce spread, all affected plants should be removed from the field as soon as they are recognized and then destroyed.

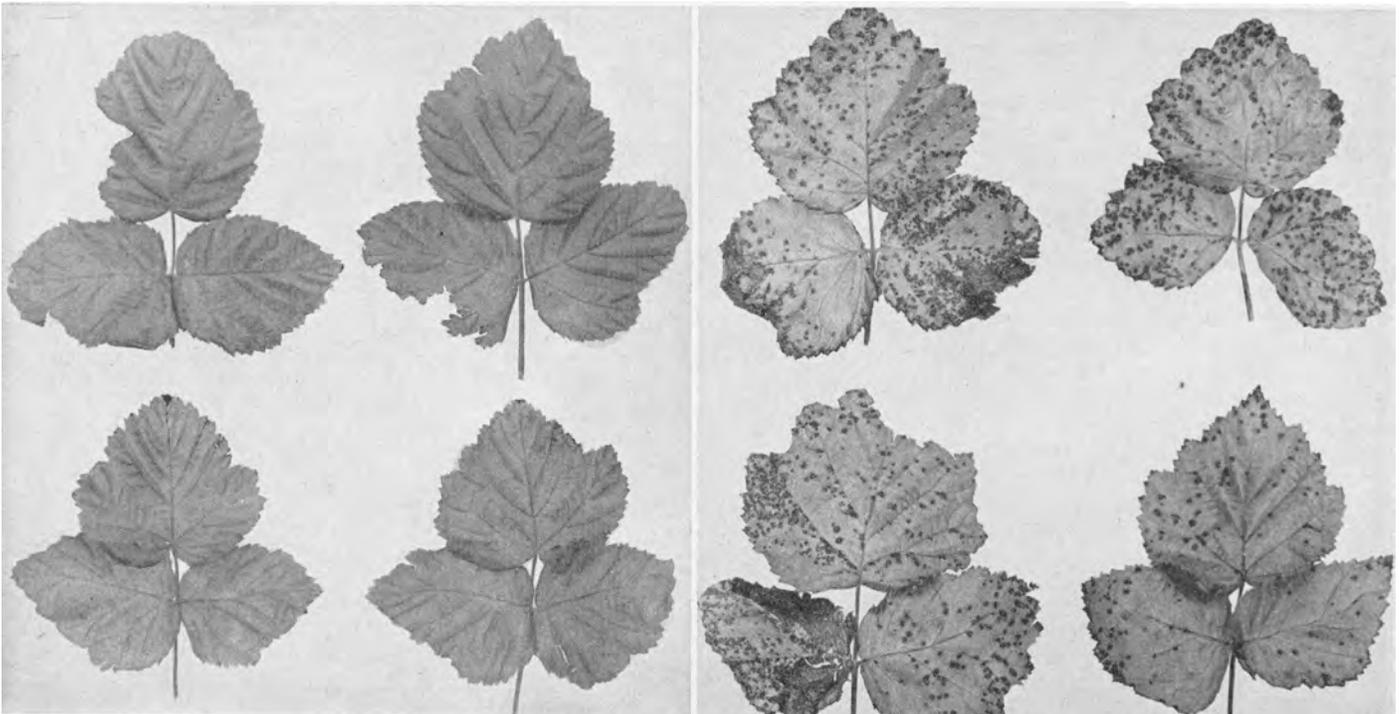
The calico or yellow blotch mosaic disease is commonplace in Logan, old plantings often being 100% affected. This virus disease does not seriously injure the Logan if it receives irrigation. Under the present system of culture in which irrigation is not generally practiced the yellowed areas in the leaves of fruiting canes may begin to show injury from sunburn and wind early in the season. In years of low rainfall considerable injury may result.

These virus diseases also occur in the native Pacific Coast blackberry, consequently Logan planted in close proximity to native blackberry may suffer the greatest damage. Control of these diseases lies in the careful selection of disease free plants and in their propagation outside of the present Loganberry districts. It would be better to grow the crop at a distance from the native wild blackberry.

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**Relation of Blackberry Varieties to the More Common Diseases. The Plus Sign—
+—Indicates Susceptibility.**

Disease	Variety		
	Logan	Boysen	Young
Powdery mildew	—	+	+
Verticillium wilt	—	+	+
Dwarf	+	—	—
Calico	+	—	—
Leaf and cane spot	+	+	+
Orange rust	+	—	+



Left, leaf from plant sprayed in March and April with Dithane Z-78. Right, leaf of Logan showing severe spotting characteristic of the Septoria leaf and cane spot disease.

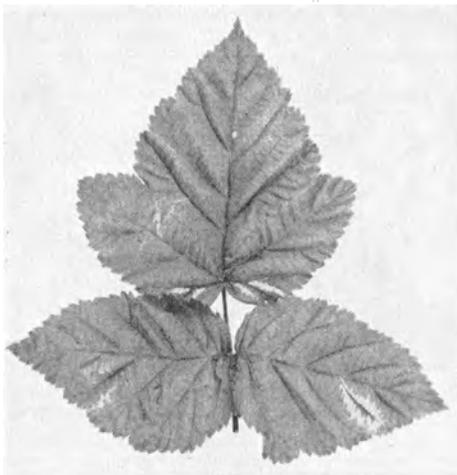
LOGANBERRY

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The means by which these virus diseases are spread other than through propagation from diseased plants are unknown.

The Septoria leaf and cane spot, caused by the fungus *Septoria rubi*, usually reaches its most serious proportions at the time of harvest in July. It is characterized by the production of small, red-bordered spots on leaves, canes and occasionally on fruit. Wet weather favors the spread and development of this disease, consequently it occurs in severe form nearly every year in the Loganberry districts of Santa Cruz County. The severe foliage injury caused by this disease also predisposes the canes to wind and sun injury. The fungus lives through the winter in lesions on canes, and in old leaves.

Spray tests carried on in Santa Cruz County for three years have shown that two sprayings in the spring with Dithane Z-78 or Parzate at the rate of two pounds per 100 gallons of water will give nearly complete protection against this disease, without injury to the plants. The first spraying should be done in March when the new laterals are leafing out, and the second in April when the flowers are just beginning to open. Since the fungus infects through the stomata, which are on the undersurfaces of the leaves, it is important that the undersurfaces be sprayed. Bordeaux mixture 2-2-50 gives as good control as either of the above materials, but may cause injury to the foliage under some conditions. Dormant spraying has



Leaves of Logan showing various yellow blotch patterns characteristic of the calico mosaic disease.

been ineffective in controlling this disease.

The orange rust disease of Logan, caused by the fungus, *Gymnoconia interstitialis* is serious wherever it occurs. Plants affected produce numerous spindly, elongate canes, very dwarfed leaves, and quickly become unproductive. Leaves break out in the spring with large powdery masses of orange colored spores. Inasmuch as the rust pervades the whole interior of the plant and therefore can not be reached by spraying, affected plants should be destroyed as soon as discovered. The native blackberry is often a reservoir of this rust.

Sunburn and wind burn of the fruiting canes and lack of water at critical times

are among the most important causes of poor yields. During dry years in the absence of irrigation little can be done to prevent injury to fruiting canes. Much of the damage from wind and sunburn could be alleviated if 1, pre- and post-harvest irrigation could be practiced, 2, if Logans were planted as close as 2½ to 3½ feet apart in the row, 3, trellised on three wires, and 4, if the new canes were tip pruned to a length of eight to ten feet at the time of trellising which may be done immediately after removal of the fruit. The dense canopy of foliage obtained by the close planting in the row and tip pruning, provides the greatest insurance against sun and wind damage. Irrigation is necessary to maintain this canopy.

Some of the other troubles observed in the Loganberry probably would not be serious if irrigation were practiced. Canes are biennial, dying naturally in the summer after fruiting. Any condition which weakens them, such as a water deficit during a hot or windy period, may bring on the dying processes at an earlier date than normal. It is rather common to see an unusually vigorous crop of new canes on plants with weakened fruiting canes. Once the dying processes in the fruiting canes begin, they apparently can not be reversed.

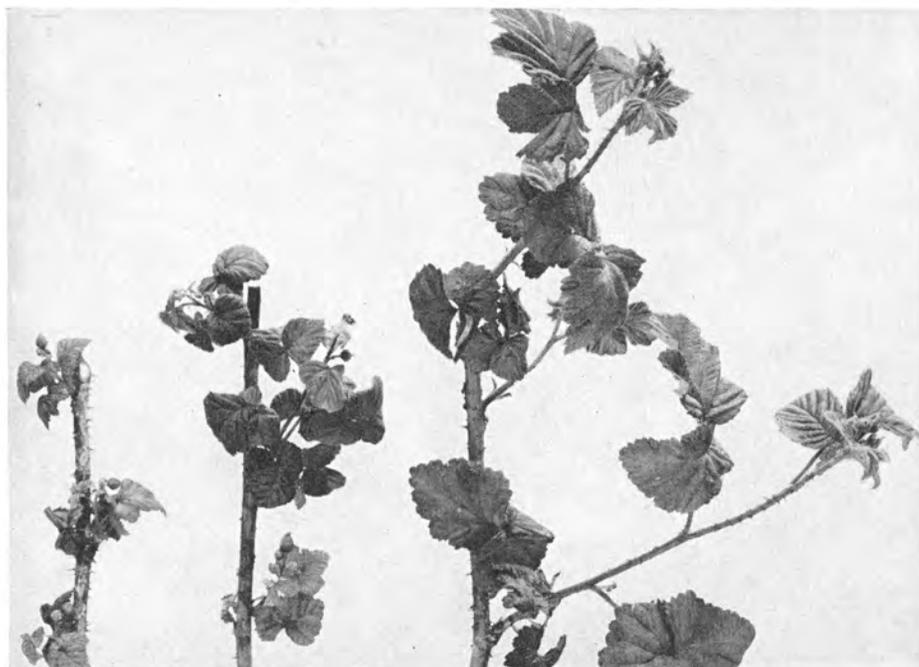
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Matt Mello, Agricultural Commissioner of Santa Cruz County and C. E. Scott, Extension Plant Pathologist, University of California College of Agriculture co-operated in the spray investigations reported in the above article.

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The two canes on the left are from plants with dwarf, the cane on the right is healthy. Note the weak fruit spurs and downward cupping of leaves. Photograph was taken in April at blossom time.