Suspected virus disease

Rusty Blotch of Japanese Plums

found throughout California

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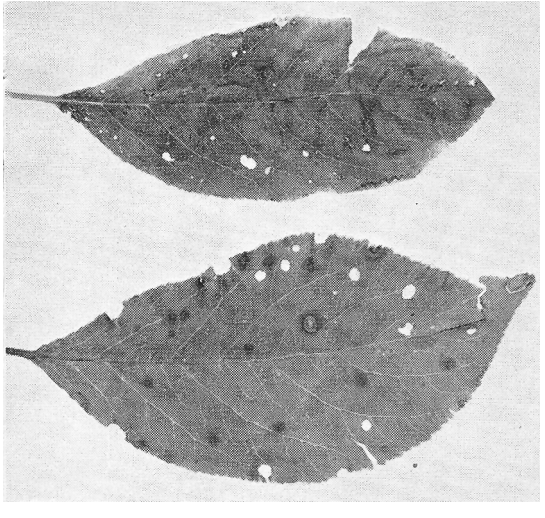
Plum rusty blotch, a graft-transmissible disease of Japanese-type plums, has been observed on several commercial varieties throughout the plum-growing areas of California. During 1960 trees showing symptoms of plum rusty blotch were found in Fresno, Kern, Madera, Merced, Placer, Riverside, San Bernardino, San Joaquin, Santa Clara, Santa Cruz, Solano, Stanislaus Sutter, Tulare, and Yuba counties. The disease has been noted on the varieties Elephant Heart, Howard's Miracle, Kelsey, Laroda, Late Santa Rosa, Redroy, and Santa Rosa. The transmitting agent is not known.

Usually symptoms are observed first on a single branch of an affected tree. Because the leaves are sparse, discolored, and reduced in size, the branch looks stringy. It produces few blossoms and almost no fruit. Since disease symptoms are generally limited to a single branch, growers have been in the habit of removing affected branches as they appear, but this practice has not prevented the disease from spreading in individual trees or even in orchards.

Early in the growing season the margins of leaves on affected trees become chlorotic, and small reddish spots appear in the discolored areas. The chlorosis may be limited to the basal portion of the leaf, may extend to the leaf apex, or may appear as blotches over the whole leaf blade. Within a few weeks the yellowed areas become rusty-colored, and the leaf spots necrose and fall away. Affected leaves are reduced to one third to one half the size of normal leaves and tend to become misshapen as the growing season progresses. Young or old leaves on any branch may show the onset of symptoms concurrently, but by autumn all the leaves on an affected branch usually show symptoms. The rusty blotch and necrosis symptoms are apparent throughout the summer and autumn because affected leaves do not drop from the tree.



Santa Rosa plum leaves. *Upper leaf* is from tree affected with plum rusty blotch. *Lower leaf* is from tree with noninfectious plum shot-hole.

Confusion Possible

A noninfectious shot-hole disorder of plum trees in California could, under certain circumstances, be confused with plum rusty blotch. However, shot-hole appears late in the growing season on mature leaves only; the initial spotting is brown or purple and occurs at random over the leaf blade; there is no reduction in leaf size and no leaf discoloration other than the incipient necrotic spots; there is no reduction in blossoming or fruit production; and the disorder has not been transmitted experimentally by tissue grafting. Noninfectious shot-hole and plum rusty blotch sometimes occur in the same tree, but this coexistence does not interfere with the symptom picture of either conditiion.

In 1954 scionwood from plum rusty blotch-affected orchard trees was grafted to four healthy Santa Rosa trees in the Riverside experimental plot. No transmission was noted for the next three years although growth from the scions perpetuated the disorder. In 1958, mild leaf symptoms of rusty blotch appeared below the graft unions, and in 1959 symptoms were evident above and below the grafts. The grafted trees produced severe symptoms from the start of growth in the spring of 1960. Buds from affected Late Santa Rosa trees were placed in six Lovell peach seedlings in 1954 and healthy Late Santa Rosa buds inserted above them. The peach seedlings were cut back to the healthy plum buds which were then forced into growth. The resulting trees showed symptoms of plum rusty blotch in the spring of 1959.

After introduction of diseased plum budwood into the Riverside plots natural spread was observed repeatedly. Santa Rosa, Late Santa Rosa, and Laroda plums, growing either on their own roots or on myrobalan rootstocks, became infected naturally. In some instances the disease spread to experimental trees which had previously been inoculated with prune dwarf or line pattern virus, but the presence of these viruses did not interfere with the symptom expression of plum rusty blotch. Natural spread in the experimental plot extended for 200′. Since spread occurred uphill, against the flow of irrigation water, the disease is not related to factors carried in water. Diseased varieties growing on rootstocks of marianna, myrobalan, peach seedling, and nectarine seedling, as well as on their own roots, have been found.

Because of its symptomatology and mode of transmission, plum rusty blotch is considered to be a virus disease. Although it occurs in only a small percentage of bearing trees in California, its distribution in the state and its natural spread in affected orchards make it of potential concern. Current research is directed toward determining the host range of the virus in plum varieties and other *Prunus* species and developing means of control.

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