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BROWN-CORE ROOT-ROT OF STRAWBERRIES IN OREGON

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The Brown-Core root-rot disease of strawberry has been known in the United States for ten years. It was discovered in Illinois in 1931, in Maryland in 1933, in California in 1934, in Oregon in 1937, and so on, until 14 states have reported it and doubtless it exists in many others. Thus it seems Brown-Core has spread rapidly in America during recent years, while it has been known in Scotland for more than twenty years. The disease is widely scattered in strawberry-producing districts of western Oregon.

NAMES OF THE DISEASE

The various names used for the Brown-Core disease are confusing. In Scotland it was first known as the Lanarkshire disease, but more recently the name Red-Core has come into use there. In the United States black-stele root-rot has been used in Illinois; some call it red stele, brown stele, or the Phytophthora disease. Brown or Red-Core root-rot seem to be the two most descriptive names of the disease. We have adopted the former, Brown-Core root-rot.

DESCRIPTION OF THE DISEASE

The color of the core of a diseased root varies at different stages in the development of the disease in white roots. The color changes from pinkish to reddish, then brownish, and finally almost black. Brown, however, is the predominant color of the core of diseased roots. All or only a few of the main roots on a plant may show this symptom, which may be seen very early in the spring and as late as June or July. Diseased roots may be recognized by stripping with the thumb-nail or cutting with a knife so as to expose the core. (See illustration.) At first the outer part of the root remains white but finally it dies, usually starting at the tip and progressing up the root. Finally, the whole root decays.

When growth starts in the spring, infected plants grow very little or not at all, depending on the degree of infection. The leaves usually turn a characteristically red color early in the season. When warmer weather appears, severely infected plants wilt and die. The wilting is the response of the plant to the invasion of the water conducting tissues of the roots by the fungus parasite. The fungus first invades the fibrous roots, killing them, and from there enters the larger roots. The root system is thus seriously depleted, leaving mainly the larger roots which are long and tapering, and decayed at the lower ends, and which usually have no branches.

CAUSE OF BROWN-CORE ROOT ROT

The Brown-Core disease is caused by a fungus, the scientific name of which is Phytophthora fragariae. The fungus is active during cool, wet weather. It doubtless attacks the roots soon after the fall rains begin and is active so long as there is plenty of water in the soil. The fungus has motile spores which swim in soil water, therefore the disease spreads most rapidly in soils which readily retain moisture. For this reason the disease spreads, persists, and is most severe in heavier soils or in locations which lack drainage. Only rarely is a whole field of strawberries infected; usually infection is limited to lower areas, at least to well identified spots. In this respect Brown-Core is distinct from black-root rot caused by Rhizoctonia. The latter does its worst damage in hill land soils which are lighter. After once established in soil, it is said the Brown-Core disease will persist for many years in spite of crop rotations.

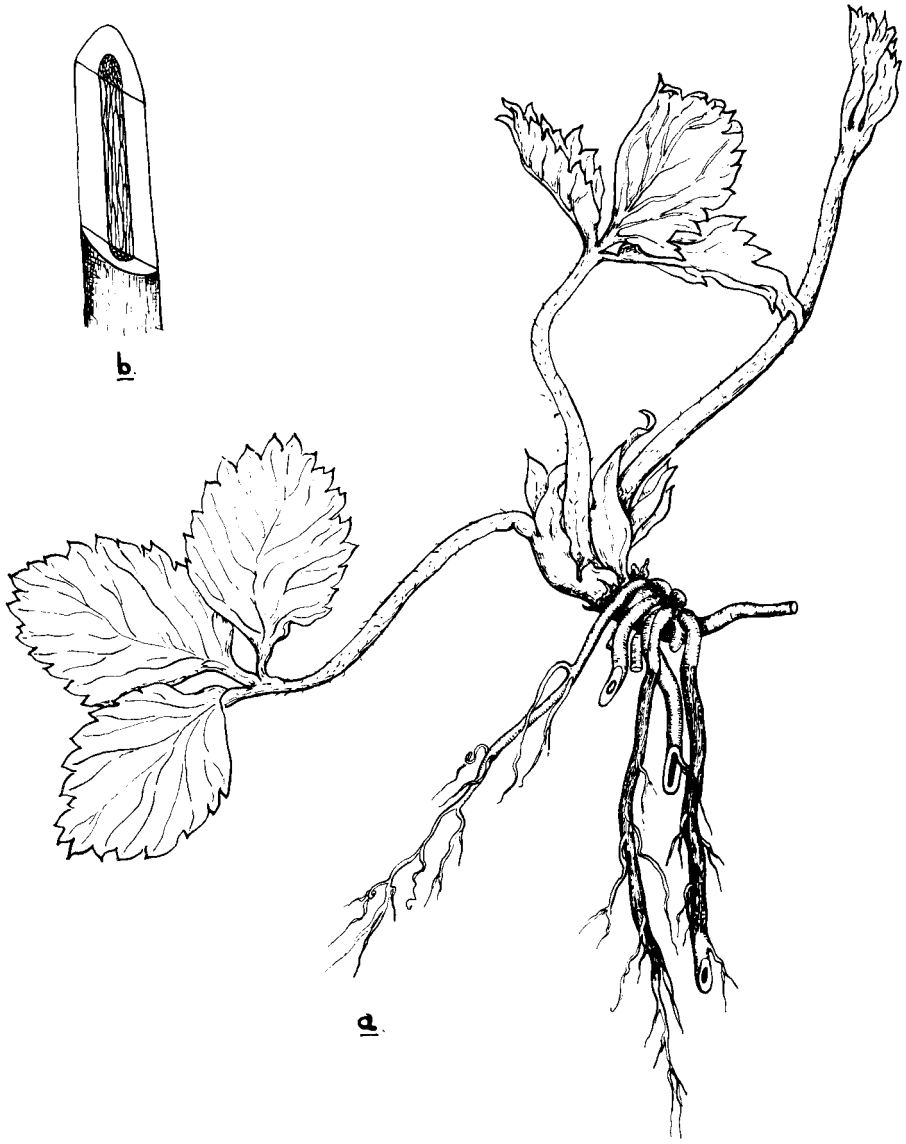
CONTROL

The Brown-Core root-rot disease spreads from diseased to healthy strawberry plants by means of the motile spores of the fungus swimming in the soil water. The principal initial source of the disease, therefore, lies in infected planting stock. The grower consequently should be as sure as possible that his planting stocks come from fields free of the Brown-Core disease. Control by spraying or dusting is hopeless.

None of the strawberry varieties used commercially in Oregon seems to be resistant to the Brown-Core disease.

Tests of known varieties and efforts to breed new ones resistant to the disease are now in progress at Oregon Agricultural Experiment Station. In fact, there is no cure of any kind known for the Brown-Core root-rot disease after it becomes established in strawberry plants or fields.

It is essential that growers select a deep, easy-working, well-drained soil for strawberry plantings, and avoid the heavy soils that remain water-soaked during a rainy season.



a. Strawberry plant showing how roots may be cut to show the brown-core symptoms.

b. Larger section of a root showing brown-core root-rot