

Black Root Rot of Strawberry

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Black root rot is a serious and common problem of strawberries. The term “black root rot” is the general name for several root disorders that produce similar symptoms. The disorders are not clearly understood and are generally referred to as a root-rot complex. For this reason, it is difficult to discuss black root rot as we do other diseases which usually have a specific cause. Black root rot has been found in every strawberry growing area of the United States, and a considerable incidence of black root rot has been observed in recent years in Ohio.



Figure 1. Note the discolored (black) roots on this plant affected with black root rot.

Symptoms

Black root rot is most common in fields with a long history of strawberry production. Symptoms begin with some plants in a field showing reduced vigor, often in low or wet spots or in portions of the field where the soil has become compacted. This decline in vigor usually begins during the first fruiting year. The symptoms are most apparent the last couple of weeks before harvest. Although severely affected plants may die before harvest, it is more common for diseased plants to continue living but become stunted and produce a reduced crop of small berries. The percentage of plants affected in any individual field usually increases significantly the year following the first appearance of symptoms.

Diagnosis is made by digging up declining plants and examining their root systems, about the time that fruit begin to color. Abundant fleshy white roots and fine lateral roots will be seen on healthy plants, and the interior of the older woody roots is yellowish-white. With black root rot, there is usually a loss of many fine lateral roots, and irregular black patches occur along the length of the fleshy white roots. In severely affected plants, these black patches grow together so that no white roots are visible. The interior of infected older woody roots turns black.

Potential Causes

Several different fungi have been implicated as causes of black root rot, as have certain environmental stresses such as cold injury, soil compaction, and excessive water in the root zone. In some soils, black root rot has been associated with an interaction between a particular soilborne fungus and the lesion nematode *Pratylenchus penetrans*. It is likely that black root rot symptoms result from one

or more of the following: (a) gradual buildup in the soil of disease—causing microorganisms and nematodes when strawberries are grown with inadequate rotation; (b) interaction of these organisms with environmental or other stress factors such as herbicide injury, winter or cold injury, and excessive soil moisture that might make plants more susceptible to attack; and (c) certain soil conditions such as heavy (clay) or poorly drained soils that might favor the activity of disease—causing fungi and/or inhibit the ability of the strawberry plant to produce new roots to compensate for their damage. Additional factors may also be involved.

Control

Because several factors appear to be involved in the black root-rot complex, no general control measure is totally effective. The following may help to reduce its incidence:

- Always start plantings with healthy white-rooted plants from a reputable nursery.
- Rotate out of strawberries for at least 2–3 years before replanting.
- Minimize soil compaction and increase tilth by incorporating organic matter, such as straw from a rotational grain crop.
- Avoid heavy, wet soils and improve drainage in marginal soils by tiling or planting on raised beds.
- Preplant fumigation of the soil is sometimes helpful, but not always.

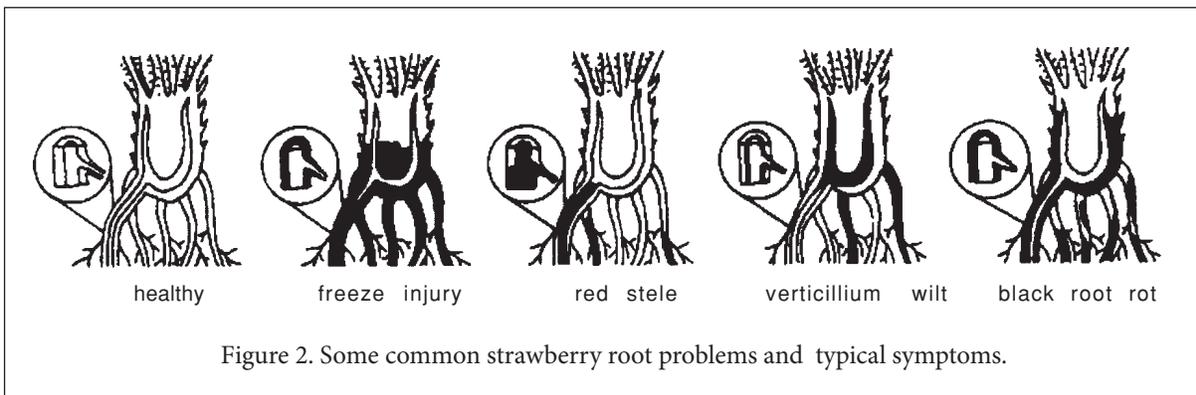


Figure 2. Some common strawberry root problems and typical symptoms.

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