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## Strawberry Root Diseases

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**Ornamental Diseases**

**Purdue University**

**Cooperative Extension Service**

**West Lafayette, IN 47907**

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## **Strawberry Root Diseases**

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Every year Indiana strawberry growers are puzzled by areas of dead plants in their strawberry plantings. These areas vary from a few plants to the entire planting. Often this is the result of strawberry root diseases--either black root rot, red stele or *Verticillium* wilt.

### **Black Root Rot**

This is the most common of all root diseases. It is caused by a complex of soil inhabiting fungi and nematodes. Adverse conditions such as winter injury, fertilizer burn, herbicide injury, nutrient deficiency, drought, or excess water are also thought to be involved.

This disease usually occurs in the spring. Around picking time plants suffering from root rot start to wilt, the leaves turn brown, and the plant dies. Affected plants show brown to nearly black roots which dry out and die. These roots are much smaller than normal.

Care in selecting planting sites may help avoid black root rot. Avoid heavy or poorly-drained soils. Do not replant strawberries on the same site until after at least a 2 year rotation. Use only sound, white-rooted planting stock. Soil fumigation will often help in the control of black root rot as well as *Verticillium* wilt and is recommended in most commercial disease control programs where strawberries are continually planted. Soil fumigation is not recommended for homeowners due to the toxicity of the chemicals involved; homeowners should rely on rotation.

## Red Stele

This disease is caused by a fungus which thrives in cold, wet soil and is therefore most apt to occur in low, wet areas of the field. In a plant infected with red stele, the center (or stele) of the root is a distinctive brick-red instead of the normal yellowish-white. The discoloration may extend the length of the root but not into the crown. Other symptoms of red stele are poor growth and wilting of plants, older leaves turning yellow or red, and stunted plants.



**Low, wet areas of the field are most likely to have plants infected with red stele.**

To keep the disease out of the new planting, avoid planting infected stock. Examine the planting stock carefully. If any roots have a "rat-tailed" appearance, cut them lengthwise and look for the red stele. Avoid setting plants in heavy soils or in poorly-drained areas. Neither soil fumigation nor crop rotation will reliably provide adequate control of red stele. Disease resistant varieties (see Table 1) and improved soil drainage should be emphasized.

**Table 1. Disease Resistance of Strawberry Varieties Commonly Grown in the Midwest.<sup>1</sup>**

(From: 1991 Illinois Small Fruit & Strawberry School proceedings)

Cultivator	Red stele	Verticillium wilt	Leaf spot	Leaf scorch
<b>Junebearing</b>				
Allstar	R	R	R	R
Canoga	I	I	R	R
Cardinal	S	S	R	R
Catskill	S	R	S	R
Delite	R <sup>2</sup>	R	R	S-R
Earliglow	R <sup>2</sup>	T-R	S-R	R
Guardian	R <sup>2</sup>	T-R	S-R	R
Honeye	S	S	R	R
Jewel	S	S	R	R
Lester	R	R	R	R
Midway	R <sup>2</sup>	S-I	S	S
Pocahontas	S	S	S-R	S-I
Raritan	S	S	S	S
Redchief	R <sup>2</sup>	R	S-R	R
Scott	R	I-R	S-R	R
Sparkle	S-R	S	S	S-I
Sunrise	R <sup>2</sup>	R	S	R
Surecrop	R <sup>2</sup>	R	S-R	S-R
Tennessee Beauty	S	R	R	S-R
<b>Everbearing</b>				
Tribute	R	T-R	T	T
Tristar	R	R	T	T

<sup>1</sup> The best method of avoiding red stele and *Verticillium* wilt is to use resistant varieties; however, root diseases are not the only diseases to attack strawberries. Leaf spot and leaf scorch are two important foliar diseases of strawberry. The more disease resistance is incorporated into your overall management program, the better.

<sup>2</sup> Resistant to several races of the red stele fungus.

<sup>3</sup> Tolerant = the disease is clearly evident but with little or no apparent detrimental effect on plant or yield.

S = susceptible

I = intermediate reaction

T = tolerant

R = resistant

## Verticillium Wilt

Another soil-borne fungus is the cause of this disease. Symptoms often appear about mid-July when outer leaves suddenly wilt and dry up. Growth of new leaves is retarded. Diseased plants are often scattered throughout the field in a random pattern.

The chief means for control is to grow resistant varieties (see Table 1). Also, do not grow susceptible varieties in soil previously occupied by plants highly susceptible to *Verticillium*, e.g., tomato, eggplant, pepper, melon, okra, potato, mint, brambles. Crop rotation and/or soil fumigation, as discussed under Black Root Rot, are recommended if susceptible varieties are to be planted in an area where *Verticillium* has been a problem within the past 2 years. With rotation, the site should be plowed, worked down and planted to a crop that is not susceptible to *Verticillium* wilt for a minimum of 2 years. The longer the site can be rotated away from strawberry prior to replanting, the better.

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