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### G96-1289 Diseases of Home Garden Strawberries

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## Diseases of Home Garden Strawberries

This NebGuide addresses on some of the common diseases affecting home garden strawberries in Nebraska and their control.

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Strawberries are a favored fruit of home gardens. They have been adapted to a wide range of environmental conditions, but sometimes can be challenging to grow. Strawberry yields and fruit quality are influenced by interactions of environment, diseases, pests, and soil conditions.

### Foliar Diseases



**Leaf spot** and **leaf scorch** cause similar damage to strawberry leaves, and both often occur on the same plant. They are caused by fungi that survive winter on plant residue from the previous year's plants. In spring when temperatures are 60°F to 80°F, the fungal pathogens produce spores on plant residue. The spores are splashed or blown onto green leaves where they germinate in the presence of water or dew droplets and infect the leaf.

**Figure 1. Leaf spot.**

Symptoms occur on leaves, leafstalks (petioles), fruitstalks, runners and caps. **Leaf spot** (*Figure 1*) occurs mainly on younger leaves as small, round purple spots that later develop tan centers surrounded by a purple border. **Leaf scorch** (*Figure 2*) also produces small, round purple spots, but these do not form tan centers. Leaf scorch occurs on younger and older leaves. In overgrown, frequently irrigated beds, the spots become so numerous that the leaves dry and appear scorched.

One of the more serious consequences of a severe outbreak of leaf spot or leaf scorch, is the early loss of foliage in late summer (*Figure 3*). This reduces the photosynthetic capacity of the plant which in turn

limits sugar storage in the roots along with its ability to survive winter. After several years, beds become thinned due to weakened winter-injured plants, and yields and quality decline.



**Figure 2. Leaf scorch.**

Control involves both cultural and chemical practices. When starting a new bed, plant varieties resistant to leaf spot into a location with well-drained soil. Space plants to avoid crowding and mulch between the rows. Remove dead leaf debris in early spring. It may be necessary to supplement these cultural practices with fungicide sprays using one of the products listed in *Table I*. Time the first application to protect the leaves from initial infection, and then repeat with cover sprays to maintain a healthy foliage during the season.

Read the product label for rate, application information and time limits between application and fruit harvest.



**Figure 3. Severe leaf spot due to an overgrown bed.**

**Slime molds** (*Figure 4*) are more of a colorful nuisance than they are a serious disease of strawberries. They are creamy white or brightly colored jellylike to slimy masses of fungal growth that form during warm, humid, wet weather. This jellylike structure, called a plasmodium, dries into a powdery crust composed of millions of fungal spores.

Slime molds survive on decaying organic matter and by ingesting bacteria and other microorganisms associated with decomposing plant debris. They are often introduced into a strawberry bed on straw mulch. Slime molds are not parasitic to plants but may smother individual leaves and fruits. Once introduced into a strawberry bed, slime mold spores survive in the upper layers of soil and become active during humid, wet periods in summer.



**Figure 4. Slime mold.**

Remove slime mold by physically breaking up the powdery masses or by hosing down affected plants with a fast stream of water. They will probably reappear more than once during the summer but do not cause enough damage to justify fungicide use. Well-spaced plants or rows are less prone to slime mold because greater air movement around the plants lowers humidity and discourages slime mold development.

## **Fruit Rots**

**Gray mold** (*Figure 5*) and **leather rot** are fungal diseases that plague both the backyard farmer and commercial grower. Of the two, gray mold is the most common, but leather rot is the most damaging. Both diseases are caused by fungi that inhabit the soil or survive in infected plant debris.

Green fruit as well as ripening and harvested fruit are attacked by the gray mold fungus. Infection starts when pathogen spores are blown or splashed onto fruit during wet, humid weather coupled with moderate temperatures. Infection quickly spreads to other fruits touching the rotten fruit. Affected tissue

turns light brown and often becomes covered by a velvety gray mold on the fruit surface. Affected fruits retain their shape but become tough and dry.



**Figure 5. Gray mold.**

In Nebraska leather rot is a sporadic disease that occurs during the growing season when wet warm weather occurs. Like gray mold it affects fruit of all ages. The pathogen is a soilborne fungus, and its spores are spread to fruit by splashing rain or by direct contact with the ground.

Infected ripe fruit appear dull and lifeless and have a bleached to reddish-purple to brown color. Their texture is tough, and they have a decidedly bitter taste.

Gray mold and leather rot can be controlled with a protectant fungicide program beginning at bloom. Wide row spacing, mulching and removal of plant debris help control both diseases.

### **Root Rot and Wilt Diseases**

Black root rot, Verticillium wilt and red stele are the main root diseases affecting strawberries in Nebraska. Strawberry plants produce extensive, fibrous root systems. Root growth and function are influenced by the external environment of soil and air, the amount of stored food reserves and by root and wilt diseases.

**Black root rot** is a disease complex that does not have one specific cause. It is brought on by injury from freezing-thawing or waterlogging of soil, by root and crown rotting fungi, by nematodes (roundworms) feeding on roots or by a combination of these. Blackening of roots is a natural process that occurs even in the absence of disease or stress. It is probably an aging mechanism and part of the cycle of rootlet death and regrowth. Disease and stress hasten blackening.

General symptoms include declining plant vigor and leaves that turn yellow or red and become stunted. Leaves turn brown at the margins because moisture loss through the leaf exceeds that taken up from the soil by the injured root system. Berries are small and may even wither before ripening. The bed presents an uneven or patchy appearance due to dwarfing of the diseased plants and to gaps caused by plant death.



**Figure 6. Comparison of black root rot on the left and a healthy root on the right (Courtesy G. Yuen).**

A healthy runner plant will show a cluster of main roots with white to tan lateral roots. Older mother plants will show a cluster of brown or black older roots with white to tan lateral roots. Early evidence of black root rot is the presence of brown lesions on these lateral roots. The lesions eventually may extend up and down the root so that the entire length is blackened (*Figure 6*). The cortical (outside) layer sloughs off of the structural roots, giving the roots a "rat-tail"

appearance. Crown tissues are affected as well and become brown, dry and spongy.

Because of damage to the root and crown system, affected plants steadily decline in vigor which reduces

both yield and quality. When this occurs it's time to start a new bed in a different location. Select a well-drained site and plant good stock from a reputable nursery or garden center (not plants left over after renovation of an older strawberry bed).

Symptoms of **red stele** and **Verticillium wilt** are similar. Affected plants lack vigor, are stunted, and wilt during the heat of the day. Leaves go from a shiny green to a dull bluish-green and die from the edges inward. Within the bed individual plants or clusters of plants may show these symptoms.

Follow the control practices mentioned for black root rot, and when rotating a strawberry planting do not follow tomatoes, peppers or potatoes in the rotation sequence.

Diseases can be a challenge in producing backyard strawberries. However, with good management practices, strawberries can be grown successfully with minimal fungicide input.

<b>Table I. Some Home Garden Fungicides for Use on Small Fruits<sup>1</sup></b>	
Home Orchard Spray (Captan)	Orthocide Garden Fungicide (Captan)
Garden Sulfur Dust <sup>2</sup>	Liquid Copper Fungicide
Captan 50% WP	Copper Fungicide
Fore Lawn & Ornamental Fungicide Spray (Mancozeb)	Tomato Fruit & Vegetable Fungicide (Mancozeb)
Maneb Tomato & Vegetable Dust	Tomato & Vegetable Dust (Copper sulfate)
Ferbam	Copper Fungicide (Copper hydroxide)
Captan Garden Fungicide	Copper Fungicide (Copper oleate)
Captan Garden Spray	Garden Fungicide (Sulfur) <sup>2</sup>
<sup>1</sup> These fungicides are labeled for use on certain small fruits. Strawberries may or may not be on the label. Before buying or applying any of these fungicides, check the label to make certain strawberries are listed.	
<sup>2</sup> Sulfur fungicide products are considered organic fungicides.	

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***D-8, Fruits***

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