

# Wire Stem and Bottom Rot of Cabbage

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Wire stem and bottom rot diseases of crucifers (cole crops) are both caused by the soil-borne fungus *Rhizoctonia solani*. These diseases can be easily overlooked in the plant bed. They may cause losses in stand, yield, or quality, depending on the time of the season in which they occur.

## Symptoms

### Wire Stem

Wire stem gets its name from symptoms that occur on the stem at the soil level. A dark, watersoaked lesion initially appears on the stem. Later stems become wiry and slender at the point of the lesion. Diseased crucifer plants transplanted to the field grow poorly, are stunted, and may eventually die, especially if there is inadequate moisture shortly after transplanting. If infected plants remain alive, the stem becomes tough and woody (Fig. 1). Plants that survive usually mature late and fail to produce a marketable head.



Fig. 1. Wire stem symptoms on lower stem of broccoli plant. (Photo by R. L. Wick-U. Mass.)

### Bottom Rot

Bottom rot is a disease of mature cabbage. After cabbage transplants become large enough to begin to shade the ground, the disease appears on the lower side of the head leaves that are in contact with the soil. The midrib is often the first part of the leaf attacked. Resulting lesions are sunken, black, and sharply elliptical with the long side of the lesion parallel to the side of the midrib. Lesions may dry out and become papery brown in appearance if the weather becomes dry. The surface of the lesion may be covered with a sparse, weblike mycelium. Eventually a general black decay occurs at the base of the leaf. The tip of the leaf then turns yellow and then the entire leaf wilts. Infected leaves are shed and only a naked stalk, capped with a small head, remains.

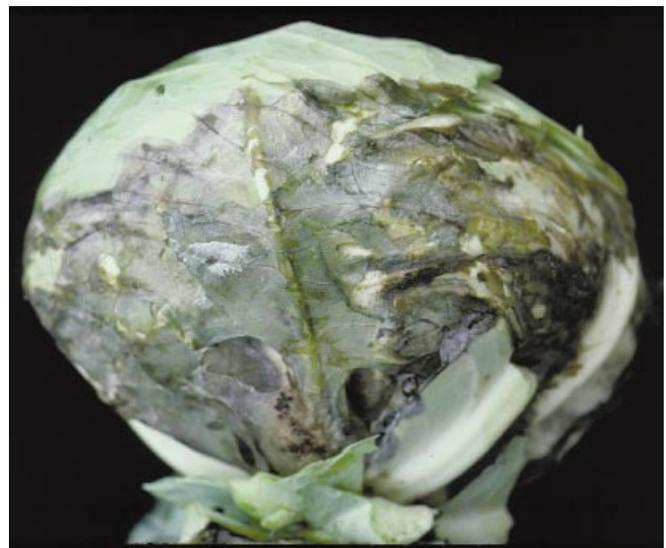


Fig. 2. Head rot, caused by *Rhizoctonia solani*, on cabbage. (Photo by R. L. Wick-U. Mass.)

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Bottom rot becomes a head rot if temperatures are warm and the relative humidity is high. A weblike mycelium develops between diseased leaves. Infected leaves are eventually covered with small, brown, fungal structures called sclerotia, which can persist on plant debris in the soil for long periods of time. The stem remains unaffected, thus, the head remains upright.

## Control

### Cultural Control

- Choose a fertile, well-drained site for the plant bed. Poor drainage favors seedling disease.
- Avoid excessive amounts of nitrogen fertilizer. Succulent plants are more susceptible to infection.
- Seed crucifers when the soil temperature reaches 69°F (21°C) and seed as shallowly as possible so that germination and emergence are rapid.
- Discard transplant seedlings that show symptoms of wire stem.

- Avoid banking or throwing soil up around plants during field cultivation.
- Harvest cabbage heads early. Cabbage leaves become more susceptible the longer they stand in the field.

### Chemical Control

- Fumigation of plant beds will eradicate seedling pathogens, such as *Rhizoctonia solani*; however, fumigated soil can become reinfested if pathogen-infested field soil is moved to fumigated areas.
- For cabbage and broccoli, quitozene (e.g. Terraclor 75WP) fungicide can be used in the transplant water at a rate of 6-8 T/gal (3/4 pint/plant). This fungicide is not registered for use in turnips, kale or collards.

### Resistance

- Resistant cultivars are not available.

Refer to the current *Virginia Pest Management Guide for Home Grounds and Animals* (VCE Publication 456-018), <http://www.ext.vt.edu/pubs/pmg/>, for details on the proper use of pesticides.

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