



AVRDC - The World Vegetable Center

Fact Sheet

Pepper Diseases

Gray Mold

Botrytis cinerea

Found worldwide, particularly in temperate and tropical highlands; often found in nethouses and greenhouses



Symptoms

The most common symptom is the sudden collapse of succulent tissue such as young leaves and stems. Whitish-gray to tan powdery fungus spore masses and fungal thread-like growth (i.e. mycelium) frequently occur on the surfaces of dead plant tissue. This may appear on flower petals and the fungus may grow from the fading flower petals into developing fruit. Fruit symptoms begin as water-soaked spots that rapidly expand into large yellowish-green or grayish-brown, irregular lesions that are soft and spongy in texture. Velvet-like fungus mycelium and spores are produced on the lesion surface under cool, humid conditions.

Young pepper seedlings affected by gray mold may show damping-off with a soft tan-to-brown, water-soaked rot of the stem at or near the soil line or the cotyledons.

Leaves, if affected, show light tan or gray spots that become irregularly-shaped, water-soaked areas. These infected areas become covered by a brown fungal growth under cool and humid conditions. The leaves wither and collapse. The fungus proceeds into the stem causing death of seedlings. Invasion of lesions by secondary fungi occurs.

How to Identify Gray Mold



Brownish spots develop near the soil line or cotyledons



Water-soaked lesions on leaves and stems darken and collapse



Water-soaked spots collapse

Conditions for Disease Development

The fungus produces overwintering structures called *sclerotia* in addition to other types of spores. These structures allow the fungus to survive in soil, dead plant material or on different host plants. The fungus is easily dispersed large distances by wind or by anything that moves soil. Small pieces of infected plant tissue or fungal spores are disseminated shorter distances by splashing rain. Spores and infested soil may also be disseminated on tools and worker clothing.

In the field, gray mold development, particularly fungus sporulation and infection, is favored by cool and wet weather. The fungus requires a water film of several hours for spore germination, and a longer period of surface wetness for symptom development. Optimum relative humidity for spore production is about 90%, and most spores are produced during the night when the temperature is lower and the relative humidity is higher than during the day. Temperatures of 17–23°C are ideal for disease development. The length of the surface wetness period needs to be longer at the lower temperatures for disease development.

The fungus generally infects plants through wounds; for example, the rough handling of young transplants. Penetration of intact tissue is rare. Fruit can be infected through the stem scar, growth cracks, or other breaks in the skin. Plants approaching maturity are more susceptible. The fungus can also penetrate dead flower tissue or dying foliage. Thus plant debris and clippings may serve as a substrate to increase fungus inoculum. This is an important source of inoculum in nethouse/greenhouse production of pepper.

Excessive application of nitrogen makes plants such as young transplants more susceptible to gray mold. High canopy density creates conditions for extended leaf wetness at night and subsequent increased gray mold severity.

Control

Before sowing, remove and burn decaying infected plant debris in the seedbed to prevent the debris from acting as a source of spores. Remove all clippings from the seedbed if seedlings are pruned. Remove yellowing plant tissues from the plant bed. Space seedlings and transplants to allow for free flow of air through the crop.

In the nethouse or greenhouse, sanitation and environmental control through adequate heating and ventilation are important. Maintaining a relative humidity of less than 80% and a greenhouse temperature higher than that of outdoors during the night is important to prevent dew on leaves. Circulate the air with fans in nethouses or when heating greenhouses to keep warm, dry air in motion.

In the field, incorporate Botrytis-affected pepper debris into the soil and allow it to decompose before establishing a new pepper crop, or burn diseased plant debris. Plant the crop in a light, well-drained, well-prepared, fertile seedbed. Avoid overfertilizing with nitrogen. Maintain steady vigorous plant growth, but not soft luxuriant growth. Avoid wounding pepper plants and fruit during growth. Maintain weed control to minimize periods when plants are wet due to reduced air circulation. Keep water off the foliage, and water plants early in the day to allow for the foliage to dry before sunset. After harvest, if feasible, carefully collect, remove and burn, or cleanly plow under all pepper debris.

Resistant varieties are not available. Fungicide sprays, when properly timed before dense canopies are formed with yellowing foliage within, help to control the disease. New specific fungicides for Botrytis are available but they should be rotated with general protectant fungicides to prevent the development of resistance in the fungus to the new chemical controls.

For more information on the production of pepper and other vegetables, go to <www.avrdc.org>.