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STEMPHYLIUM GRAY LEAF SPOT OF TOMATO

Stemphylium gray leaf spot of tomato is distributed worldwide including the United States, particularly in humid tropical and subtropical regions. Currently, this disease remains one of the most destructive diseases of tomato in the southeastern United States. Recently, the disease has been frequently observed in commercial tomato fields and home gardens in Connecticut. The disease mainly attacks tomato leaves at all growth stages from seedling to harvest. On susceptible cultivars, the disease can cause significant early defoliation, which leads tomato fruit prone to sunscald. The pathogen also infects pepper, eggplant, potato, and some solanaceous weeds.

SYMPTOMS AND DIAGNOSTICS

The initial symptom on leaves appears as small, dark brown specks, which expand to brown spots that are approximately one tenth of an inch in diameter (Figure 1). Brown spots may be surrounded by yellow halo. As lesions enlarge, the center area turns gray in color and becomes cracked. In highly humid conditions, gray mold (fungal spores) is noticeable on the surface of lesions (Figure 2). As the disease progresses, affected leaves become chlorotic and dry, ultimately causing early defoliation. The disease rarely attack petioles and stems, and is never found on fruit. When petioles or tender stems were infected, symptoms appear as elongated brown lesions. Because the symptom of gray leaf spot highly resembles bacterial leaf spot and Septoria

Figure 1. Brown spots on a tomato leaf

Figure 2. Gray mold (arrow) on a brown spot

leaf spot of tomato, a microscopic examination is necessary for a correct disease diagnosis.

DISEASE DEVELOPMENT

Three fungal species in the genus Stemphylium, *S. lycopersici, S. botryosum* sp. *lycopersici* and *S. solani*, have been reported to cause gray leaf spot of tomato. The pathogen survives in plant debris and also can be seedborne. In the region where tomato is grown throughout the year, the pathogen can remain viable on living tomato plants. An epidemic of the disease may begin in infested seedbeds. Infected tomato seedlings, plant debris and volunteer pepper, eggplant and other wild solanaceous can serve as inoculum sources for disease epidemics in fields. Fungal spores can be dispersed by wind or air circulation, and also by splashing water resulted from rainfall and overhead irritation. Spore germination and infection require high humidity or free water on leaf surfaces. The optimal temperature for the disease development is 77 °F. So, the disease is favored by warm and wet weather conditions.

DISEASE MANAGEMENT

Host resistance: There are significant differences in resistance to gray leaf spot among tomato varieties. Cherry and grape tomatoes are more susceptible to the disease. The resistant gene, *Sm*, was derived from a wild tomato species and has been introduced to many commercial tomato varieties. Use of resistant varieties is an effective and economic way to control this disease.

Cultural practice: Use disease-free potting mix and avoid establishing seedbeds near tomato production fields to grow transplants. Avoid overhead irrigation. Water plants in the morning to allow for leaf drying before evening. Avoid water seedlings and plants in cloudy and rainy days. Inspect transplants carefully before planting them in a garden or a field. Rotate tomato with non-solanaceous crops for 2-3 years. Space tomato plants appropriately to promote good air circulation. Remove volunteer tomatoes and other solanaceous plants that may harbor the pathogens. Remove all plant materials from gardens and fields at the end of the season to reduce inoculum for next season.

Fungicide application: Inspect plants carefully for first signs of the disease in seedling beds or fields and apply fungicides at early onset of the disease. Fungicides that are registered for home gardens in Connecticut include chlorothalonil, mancozeb, and copper products. Always follow the label directions when pesticides are used.

December 2018