

Horticulture Diagnostic Laboratory



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Fusarium and *Verticillium* Wilts of Tomato

Fusarium Wilt

Symptoms: The *Fusarium* fungus attacks plants of all ages. The first indication of disease in small plants is a drooping and wilting of lower leaves with loss of green color in the midrib. The plant often dies before reaching the flowering or fruiting stage.

In older plants, the first symptom is a yellowing, wilting and dying of lower leaves, often on one side of the plant or on one shoot. As the disease progresses up the stem, successive leaves yellow, wilt and die, the plant becomes stunted, goes into a permanent wilt and dies with brown leaves clinging to the stem. If the disease attacks the plant early, and conditions are favorable for it, there may be little or no normal fruit. If the disease attacks the plant when it is older, fruit on the lower clusters may be normal, but small and inferior in the upper part of the plant.

The lower portion of the stem of a wilted plant, when cut, lengthwise or when the "bark" is peeled, shows streaks of brown discoloration in the woody tissue. In severely wilted plants this brown color may extend to the top of the plant. In warm prolonged moist conditions, a white to pale pink mold may grow in wounds in the stem or in old leaf scars.

Causal Agent and Disease Cycle: The fungus, *Fusarium oxysporum* f. sp. *lycopersici*, attacks only tomato and is able to live on decaying tomato tissue in the soil. It is favored by soil temperatures between 78° and 90° F. In some soils it lives three or four years if tomatoes are not grown; in others, especially if they are sandy, light and dry, it may live indefinitely. It grows from the soil into the feeder roots of the plant and from there into the woody part of the stem.

Control: The easiest practice is to plant the tomatoes in another field or location for three or four years. Where land is limited, chemical soil treatment may be feasible. Soil sterilization with steam or treatment with a chemical is effective in the greenhouse and will suppress the fungus for a year or two, but it may be too costly. Because of the present trend to restrict or eliminate some pesticides, it is advisable to consult extension specialists. Soil treatment usually is not practical for home gardens. Using resistant varieties is the best method to avoid this disease. For a list of resistant varieties go to [Selected List of Vegetable Varieties for Home Garden Use in New York State](#) or contact our office.

Verticillium Wilt

This disease is caused by the fungus, *Verticillium albo-atrum*, which is present in most soils and infects a wide range of woody and herbaceous plants. It is less common on tomatoes than *Fusarium* wilt and prefers lower temperatures, around 70° -75° F. Since the wilt symptoms are similar, the organism can be identified with certainty only in the laboratory.

Symptoms: *Verticillium* affects the plant uniformly and does not show first on one side or on one shoot as does *Fusarium*. Yellowish blotches appear on the lower leaves, then brown veins may appear and finally brown dead spots. The brown spots can be confused with those caused by early blight, but differ in that they are light brown and not dark brown to blackish. They also lack the concentric zones which produce a target effect typical of early blight. The leaves wilt, gradually wither, die and drop off. The disease progresses slowly up the stem, and the plant is stunted. Only the tip leaves appear green and alive and the fruit is small. Defoliation exposes the fruit to sunscald and yellow shoulder.

Verticillium enters the plant through the feeder roots and grows into the stem in the woody conducting tissue just under the "bark." The woody tissue is discolored brown and similar to *Fusarium*, but is usually darker.

Control: Rotation-planting in another location for four to six years is suggested. This often gets away from the trouble, but not always, because the fungus attacks many plants and may be present in the new location. The disease is erratic. Sometimes no trouble develops the next year, and sometimes it appears where there was none the previous year.

For a list of resistant varieties go to [Selected List of Vegetable Varieties for Home Garden Use in New York State](#) or contact our office.

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