

Small, watersoaked spots appear which are slightly raised and 1/8 to 1/4 inch in diameter. There may be a slight halo around the spot which eventually disappears leaving a scabby lesion. Leaf infection occurs through natural openings while wounds are common entries for fruit infection.

Bacterial spot is difficult to control in the field so care must be taken to avoid purchase of infected transplants. Destroy the old crop residue once harvest is complete and keep volunteer tomato plants out of fallow land. Preventative copper sprays are used to control mild outbreaks in the field. Avoid excessive use of copper, since it can be toxic to plants and can build up to toxic levels in the soil. Consult Plant Pathology Fact Sheet No. 3 for more information.

**Bacterial wilt** Caused by *Pseudomonas solanacearum*, this disease is distinguished from fusarium and verticillium wilts by the rapid wilt, lack of foliage yellowing, and hollowness of stems. Stems cut from plants with bacterial wilt exude a gray-brown, flowing material from the cut. The bacteria enters the plant from various types of wounds to the roots.

To control bacterial wilt, avoid planting in low, wet areas or on land with a history of bacterial wilt. Rotate fields to non-solanaceous crops. Fumigation of seedbed and field may help where the disease is anticipated. Avoid movement of machinery or water from infested fields to non-infested areas.

**Black shoulder** On fruit approaching maturity, dark gray-to-black areas appear on the shoulders. These areas become leathery and often sunken. The cause of the problem is not known but is worse in cool, rainy weather, and affects some cultivars more than others. The only practical method of control is to use cultivars which are tolerant of this problem.

**Blossom-end rot** This disorder is a physiological problem caused by calcium deficiency and water stress. The blossom-end of the fruit collapses and shrivels to a leathery, dark, dry rot. Conditions which limit calcium availability to the plant lead to blossom-end rot. These include acidic soils, droughty soils, and flooded soils.

To control the problem avoid those conditions listed above. Follow a program of soil testing and careful water management. Foliar fertilization with calcium is difficult because it requires many applications of calcium, each in small amounts, to provide enough calcium to youngest plant parts.

**Brown root rot** This disease, caused by *Pyrenochaeta lycopersici*, is the principal cause of "old land decline" disease in Dade county. The

symptoms consist of corky lesions on roots. Control of brown root rot is achieved through rotation and fumigation.

**Buckeye rot** This disease, caused by *Phytophthora parasitica*, affects fruits which touch the ground. Infected spots enlarge in a series of irregular, concentric bands.

To control buckeye rot, provide good field drainage, and grow the crop using stakes and plastic mulched beds which reduce fruit contact with soil.

**Damping-off** Caused by several fungi, this disease affects young seedlings in the transplant bed or shortly after setting in the field. Seedlings wilt, fall over, and usually cause damage to the stem. Direct-seeded crop stands also can be reduced by direct attack to the germinating seeds especially in cool, damp soils.

To control the disease, start with fungicide-treated seed and soil fumigation. Maximize soil drainage and use plastic mulch to increase soil temperature. For more information, see Plant Pathology Fact Sheet No. 1.

**Early blight** The causal organism, *Alternaria solani*, can infect all above ground portions of the plant. On the leaves, small, brown lesions enlarge to irregular spots which consist of a series of concentric rings. Similar lesions can develop on stems. Fruit is usually infected near the calyx in the green or ripe stage. Lesions are black, sunken, irregular in shape and have a characteristic concentric ring appearance.

The most effective control measure is to follow a fungicide application schedule in the seedbed and field. For more information, consult Plant Pathology Fact Sheet No. 7.

**Fusarium wilt** Three races of the organism *Fusarium oxysporum* f. *lycopersici* have been found in Florida. The disease first appears in the field as yellowing of older leaves. This occurs on one side of the leaves and on one side of the plant. Eventually the whole plant wilts and dies. The vascular tissue of diseased plants is dark brown in color, especially near petiole scars.

To control race 1 and 2 wilt, use resistant varieties where possible. Prevent the appearance of race 3 by restricting the movement of infected plants or infested soils from areas having the disease. Rotation