oil-borne fungal diseases can be a major problem of tomatoes. There are three steps to understanding and managing tomato diseases in the home garden. The first step is to understand the disease cycle of a typical fungus. The second is to recognize symptoms of important fungal diseases of tomato, and the third is to apply good cultural practices to help minimize the damage caused by these diseases.

Simply, fungi live and obtain their nourishment from infected host tissue. Fungi reproduce by spores, tiny microscopic bodies, which are spread by wind, water, or other mechanical means to a new host. On the host, spores germinate and infect healthy plant tissue causing symptoms including leaf spots, rots, and wilts that lead to premature defoliation and reduced tomato yields. Development and spread of fungi in the home garden is determined by rainfall, relative humidity, free moisture, and temperature.

Some of the most common fungal diseases that infect tomatoes grown in the home garden include Anthracnose fruit rot, Early blight, Septoria leaf spot, Late blight, and Buckeye rot all which produce distinct symptoms making them easily diagnosable by the home gardener.

**Anthracnose Fruit Rot**

Anthracnose fruit rot is a soil-borne disease that affects ripe tomato fruit. Infections go unnoticed on green fruit and as fruit ripens depressed circular water-soaked spots appear on red fruit. These spots may slowly enlarge to about 1/4 inch in diameter and produce black fungal structures (microsclerotia) in the center of the lesion just below the skin surface. Microsclerotia can overwinter in the soil and serve as a source of inoculum for the next growing season.

**Early Blight**

Early blight can infect tomato foliage and fruit. On tomato foliage, Early blight first appears as circular irregular black or brown spots on the older leaves of the plant. As these lesions enlarge a series of dark concentric rings develop in the center of the spot creating a distinct target pattern. Over time the tissue surrounding the early blight lesions can yellow and cause the leaves to drop. Severe infestations of this disease can cause 100% defoliation of the plant.
Early blight can infect the fruit through the calyx or stem attachment in the immature green or red stage and can produce distinct target-like lesions similar to foliar infection. Defoliation caused by early blight can reduce fruit yield and can leave the fruit open to sunscald injury.

Septoria leaf spot is a soil-borne fungal disease that only infects tomato leaves and stems. The spots enlarge to 1/8 inch in diameter and are distinguished by a dark brown edge with a white or gray center. As the disease develops and more leaf spots develop, the areas surrounding spots will turn yellow causing leaves to wither and die. The disease spreads from the older leaves upward and can totally defoliate a plant in a short period of time. Defoliation can severely inhibit yield and lead to sunscald injury and fruit cracking. If tomato plants become infected with Septoria leaf spot early in the growing season, plants can become 100% defoliated before fruit set.

Late blight is the disease historically associated with potatoes and the Irish potato famine of the mid-1800’s. The Late blight fungus can also infect tomato plantings. The disease will first appear as greasy-grayish indefinite patches on older leaves and stems. These spots enlarge in moist weather and may produce white fuzzy growth on the underside of infected leaves. The fungus will also attack fruit.
causing a dark, greasy colored lesion with a slightly sunken, rough surface on green fruit. These lesions may enlarge turning the whole fruit brownish-black. Infected fruit often remain firm. Severe infestations can cause the foliage to brown and shrivel.

**Buckeye Rot**

Buckeye rot *typically* affects immature and mature green fruit that lay on the soil surface. On green fruit, buckeye rot will produce distinct brownish-black lesions that have a definite concentric or target-like appearance. In moist conditions, white fluffy fungal growth will develop on infected fruit. Over time, infected fruit will become soft and mushy.

**Control Measures for Fungal Diseases in the Home Garden**

There are a number of cultural practices that can be used to help reduce tomato disease in the home garden. The first cultural practice is to remove old plant debris. Fungal spores can overwinter in infected plant debris and on weeds related to tomato, such as horse nettle, ground cherry, and night shade. During the next growing season overwintering fungal spores are splashed from infested tomato or weed debris in the soil on to newly planted tomatoes restarting the disease cycle.

Proper sanitation measures can keep spores from infecting the next crop. At the end of the growing season all tomato refuse should be removed and
discarded, composted (if the pile is hot enough to kill the spores) or tilled into the soil. Thoroughly burying the residue will keep the spores below the soil surface and away from tomatoes.

Crop rotation is another means to help reduce disease in tomato plantings. Each year plant tomatoes in a new location away from areas where tomatoes, eggplant, potatoes or peppers have grown in the past. These vegetables all have similar disease problems. A minimum rotation of three years is considered essential to help reduce populations of soil-borne fungi.

A second line of defense against leaf spot diseases is to alter the microclimate surrounding tomato plants. Fungi thrive in moist, humid conditions, in particularly on leaves that remain wet for long periods of time. Tomatoes should be grown in full sun with good air circulation to dry the leaves. Staking or caging tomatoes brings the plants up off the soil and allows more rapid drying of the plant.

Watering should be performed in the morning to allow sufficient drying time. The use of a soaker hose to irrigate completely eliminates regular wetting of the leaves.

Cover crop mulches such as composted leaves or straw mulch can be placed on the soil surface to help reduce soil-borne fungal diseases such as Buckeye rot and Anthracnose fruit rot by keeping developing fruit from coming into direct contact with the soil surface. The soil beneath and surrounding the tomato plant should be covered with at least 6 inches of mulch early in the tomato season. Mulching tomato plantings this way may also reduce weeds and prevent loss of soil moisture during the growing season.

Preventative fungicides can also be used to control fungal diseases in the home garden. Always read and follow directions on the label.