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BLACKMOLD OF TOMATOES

Blackmold, a rot of ripe tomato fruit, occurs wherever tomatoes are grown in California. It develops sporadically following periods of warm humid weather or unseasonable early rainfall. Proper cultural control measures along with properly timed treatments with fungicides can minimize losses to blackmold.

The disease is characterized by obvious lesions which appear on the surface of ripe fruit. Lesions are light to dark brown and vary from small flecks affecting only the surface of the fruit to large, more or less circular, sunken lesions with decay extending into the fruit itself. During warm, humid weather the causal fungus may produce spores to form a black, velvet-like layer on the surface of the sunken lesions. Spores seldom form on the shallow surface lesions.

Blackmold is caused by the fungus *Alternaria alternata*. It is among the most common fungi encountered in nature. It lives and multiplies on dead organic matter whenever moisture is present, and can be found on dead and older senescing leaves in tomato fields before fruit ripens. Because *A. alternata* is a weak pathogen only able to colonize weakened tissue, it infects tomatoes only after fruit has ripened.

Two other tomato diseases that are caused by *Alternaria* fungi and sometimes confused with blackmold are early blight, caused by *Alternaria solani*, and stem canker, caused by *Alternaria alternata* f. s. *lycopersici*. Both pathogens invade leaves, stems, and green fruit but neither infects ripe tomato fruit.

Blackmold appears in the field after rain or dew. Free water must be present three to five hours before fungus spores germinate; infection by direct penetration of the epidermis follows soon thereafter. The fungus may also infect fruit that have damage, including sunburned fruit. Thus dews of even short duration provide conditions favorable for disease establishment. The crop may be totally destroyed within four to five days following a period of rain and high humidity.

Fortunately there are several steps that can be done to prevent this disease from infecting the fruit. Late season overhead irrigations should be avoided which produces leaf wetness, high humidity, and wet bed surfaces which all favor blackmold development. The fruit should be protected from sun exposure by using proper fertilization rates to produce a full canopy and selecting varieties that produce adequate canopies.

These steps will help minimize the incidence of blackmold. However because dew formation, periods of high humidity, and rain are difficult to predict, preventive chemical treatments are usually necessary for disease control. University trials using variously timed applications have demonstrated that maximum benefits from fungicide applications can be obtained if initial treatments are made six weeks before anticipated harvest. One or two additional treatments may still be required, but the key is to make the initial application six weeks before harvest. It is not important as to which fungicide is used on the initial application, but that it is applied six weeks before being harvested. It is not known why early applications of fungicides are essential for control of blackmold, but these may prevent the fungus population from building up on dead or senescent leaves in the field. Fungicides applied closer to harvest than two weeks, unless just prior to rain, are of doubtful value.

Cultural practices that encourage dense leaf canopies and selection of varieties that develop and retain a heavy canopy aid in preventing blackmold by protecting from fruit sunburn injury. Harvest dates are extremely important because the longer fruit remains in the field after ripening, the more likely blackmold will develop. Although delays are usually beyond control of the grower, harvest as soon after ripening as possible. Tomatoes planted for late harvest are most vulnerable to severe losses from blackmold.

Note: Much of this article is based on UC Leaflet 21154 Blackmold of Ripe Tomato Fruit by Dennis H. Hall, Beth L. Teviotdale, and A. O. Paulus.

