

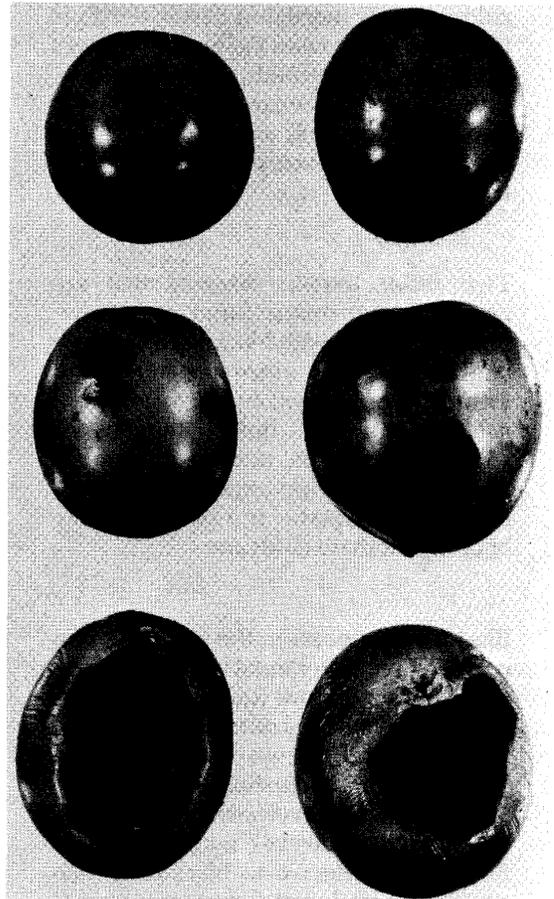
# BLACKMOLD OF RIPE TOMATO FRUIT

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Blackmold, a rot of ripe tomato fruit, may occur wherever tomatoes are grown in California, but is found most commonly in processing tomato crops from the Delta north. It develops sporadically following periods of dew or unseasonal early rainfall. Properly timed treatments with certain fungicides can minimize losses to blackmold.

## Symptoms

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 epidermal tissue to large, more or less circular, sunken lesions with decay extending into the carpel wall and often into the seed locule (see figure). During warm, humid weather the causal fungus may sporulate to form a black, velvetlike layer on the surface of the sunken lesions. Spores seldom form on the shallow surface lesions, which are of no consequence when fruit is graded after harvest because fruit affected by surface lesions are not included in total percent of molded fruit.



Ripe tomato fruit infected with blackmold fungus showing superficial lesions (top) to large deep lesions (bottom).

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### Causal fungus

Blackmold fungus, *Alternaria alternata*, (Fr.) Keissl., 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 senescing leaves in tomato fields before fruit ripens. Because *A. alternata* is a weak pathogen able to colonize only moribund tissue, it infects tomatoes and causes visible lesions only after fruit has ripened. Infections sometimes occur on green fruit but only one or two epidermal cells are affected and the lesions do not develop further even after fruit ripens.

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 attacks ripe tomato fruit. *A. alternata* f.s. *lycopersici* is a pathogen only of certain tomato cultivars.

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. Thus dews of even short duration provide conditions favorable for disease establishment. However, rainfall usually is far more conducive to blackmold than are dews: total destruction of a tomato crop may occur within four to five days following a period of rain and high humidity. In the absence of rain, fruits protected by a leaf canopy seldom develop blackmold because dew is deposited only on fruit surfaces fully exposed to the sky.

### Control

Because dew formation and rain are difficult to predict, preventive chemical treatments are necessary for disease control. Trials using variously timed applications have demonstrated that maximum benefits from fungicide applications can be obtained if initial treatments are made five to six weeks before anticipated harvest, followed by one or two additional treatments. If two treatments are used, the second application should be made in 18 to 20 days. Use 14-day intervals between applications if three treatments are to be made. 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. Success of prerin applications depends on sufficient warning from weather forecast agencies to allow time for treatment. Among fungicides found to be effective for control of blackmold are Difolatan, mancozeb (Dithane M-45 or Manzate 200), Bravo, and Dyrene. These should be used in accordance with label instructions.

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



**PLANT  
PESTICIDE USE WARNING — READ THE LABEL**



Pesticides are poisonous and must be used with caution. READ the label CAREFULLY BEFORE opening a container. Precautions and directions MUST be followed exactly. Special protective equipment as indicated must be used.

**STORAGE:** Keep all pesticides in original containers only. Store separately in a locked shed or area. Keep all pesticides out of the reach of children, unauthorized personnel, pets and livestock. DO NOT STORE with foods, feeds or fertilizers. Post warning signs on pesticide storage areas.

**USE:** The suggestions given in this publication are based upon best current information. Follow directions: measure accurately to avoid residues exceeding tolerances, use exact amounts as indicated on the label or lesser amounts given in this publication. Use a pesticide only on crops, plants or animals shown on the label.

**CONTAINER DISPOSAL:** Consult your County Agricultural Commissioner for correct procedures for rinsing and disposing of empty containers. Do not transport pesticides in vehicles with foods, feeds, clothing, or other materials, and never in a closed cab with the vehicle driver.

**RESPONSIBILITY:** The grower is legally responsible for proper use of pesticides including drift to other crops or properties, and for excessive residues. Pesticides should not be applied over streams, rivers, ponds, lakes, run-off irrigation or other aquatic areas except where specific use for that purpose is intended.

**BENEFICIAL INSECTS:** Many pesticides are highly toxic to honey bees and other beneficial insects. The farmer, the beekeeper and the pest control industry should cooperate closely to keep losses of beneficial species to a minimum.

**PROCESSED CROPS:** Some processors will not accept a crop treated with certain chemicals. If your crop is going to a processor, be sure to check with the processor before making a pesticide application.

**POSTING TREATED FIELDS:** When worker safety reentry intervals are established be sure to keep workers out and post the treated areas with signs when required indicating the safe reentry date.

**PERMIT REQUIREMENTS:** Many pesticides require a permit from the County Agricultural Commissioner before possession or use. When such compounds are recommended in this publication, they are marked with an asterisk (\*).

**PLANT INJURY:** Certain chemicals may cause injury or give less than optimum pest control if used at the wrong stage of plant development; in certain soil types; when temperatures are too high or too low; the wrong formulation is used; and excessive rates or incompatible materials are used.

**PERSONAL SAFETY:** Follow label directions exactly. Avoid splashing, spilling, leaks, spray drift or clothing contamination. Do NOT eat, smoke, drink, or chew while using pesticides. Provide for emergency medical care in advance.