

## Alternaria Stem-End Rot<sup>1</sup>

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### CAUSAL ORGANISM AND DISEASE CYCLE

Alternaria stem-end rot is caused by the fungus *Alternaria citri*, and is a decay that develops quite slowly. It is normally an economic problem only when fruit are placed in storage for extended periods of time. At 70°F storage, significant development of the disease may occur in 5 weeks for specialty fruits and 8 weeks for round oranges. At cold storage temperatures, the decay is usually not apparent in oranges or grapefruit until after 10 weeks. Spores are produced on ground litter in the grove and carried to the fruit by wind currents or water splash. The fungus becomes established on the fruit as quiescent infections on the button or the stylar-end. Button infections are much like that of the other stem-end rots caused by *Diplodia* and *Phomopsis*, while stylar-end infections occur through growth cracks in poorly formed navels of navel oranges and Orlando tangelos.

### SYMPTOMATOLOGY

Quiescent infections at the stylar-end cause fruit on the tree to color and drop prematurely due to



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ethylene formation, and the fruit may develop a light brown to blackish discoloration of the rind. Lesions developing from quiescent infections of the button become light brown to black in color, and gradually progress over the fruit surface from the blackened button towards the stylar-end. Internal black discoloration of the fruit core, called black rot, may also occur from quiescent infections of the stylar- or button-end of the fruit. These infections can only be discerned when fruit are cut at the time of consumption.

### CONTROL

Stylar-end infections of this fungus have not been successfully controlled with field fungicide

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**black rot.**

sprays. Delaying harvest until affected fruits have dropped to the ground is necessary in some situations, to prevent the inadvertent inclusion of diseased fruit, particularly if the fruit are to be used for juice. During storage, snap-picked fruit usually develop more of the stem-end phase of the decay than fruit that are clipped. *Alternaria* is insensitive to many fungicides used to control the other major citrus decays. In fact, applications of TBZ or benomyl may even increase the incidence of *Alternaria* stem-end rot. Control has been obtained by the use of imazalil (see Circular 359-A, Postharvest Decay Control Recommendations for Florida Citrus Fruit) or 2,4-D, or both, on harvested fruit. The growth regulator 2,4-D delays the onset of senescence of the fruit button, thereby delaying or restricting the movement of the pathogen into the fruit.