UF IFAS Extension UNIVERSITY of FLORIDA

PP-148

2019–2020 Florida Citrus Production Guide: Brown Rot of Fruit[1]

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Management of brown rot, caused by *Phytophthora nicotianae* or *P. palmivora*, is needed on both processing and fresh-market fruit. While the disease affects all citrus types, it is usually most severe on Hamlin, Navel, and other early-maturing sweet orange cultivars. See PP-156, *Phytophthora Foot Rot, Crown Rot, and Root Rot*, for information on other phytophthora diseases.

Phytophthora brown rot is a localized problem, usually associated with restricted air and/or water drainage. It commonly appears from mid-August through October following extended periods of high rainfall. It can be confused with fruit drop from other causes at that time of the year. If caused by *P. nicotianae*, brown rot is limited to the lower third of the canopy because the fungus is splashed onto fruit from the soil. *P. palmivora* produces abundant sporangia on infected fruit that can splash onto fruit throughout the canopy.

Early-season inoculum production and spread of *Phytophthora* spp. are minimized with key cultural practice modifications. Skirting of trees reduces the opportunity for soilborne inoculum to contact fruit in the canopy. The edge of the herbicide strip should be maintained just inside of the dripline of the tree to minimize the exposure of bare soil to direct impact by rain. This will limit rain splash of soil into the lower canopy.

Fruit on the ground become infected and produce inoculum, especially in *P. palmivora,* where fruit-grown sporangia can readily splash upward into the tree canopy. The sporangia can infect green fruit and result in brown rot infection in the canopy as early as July. The beginning of the epidemic is very difficult to detect before the fruit are colored and showing typical symptoms. Boom application of herbicides and other operations dislodge low-hanging fruit. Trees affected by huanglongbing (HLB; citrus greening) are prone to premature fruit drop. Application of residual herbicides earlier in the summer may reduce the need for postemergence materials later and minimize fruit drop throughout this early stage of inoculum production from fallen fruit.

Usually a single spray application of Aliette, Phostrol, or ProPhyt before the first signs of brown rot appear in late July is sufficient to protect fruit through most of the normal infection period. No more than 20 lb/acre/year of Aliette should be applied for the control of all phytophthora diseases. Aliette, Phostrol, and ProPhyt are systemic fungicides that protect against postharvest infection and provide 60–90 days control. Copper fungicides are primarily

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protective but are capable of killing sporangia on the fruit surface and thus reducing inoculum. They may be applied in August before or after the appearance of brown rot and provide protection for 45–60 days. If the rainy season is prolonged into the fall, a follow-up application of either systemic fungicide at one-half of the label rate or copper in October may be warranted. If a second application is needed, follow the preharvest intervals carefully (Pesticides Registered for Use on Florida Citrus). With average-quality copper products, usually 2–4 lb of metallic copper per acre are needed for control.

Precautions should be taken during harvesting to exclude brown rot–affected fruit in field containers as this could result in rejection at the processing or packing facility.

Recommended Chemical Controls

READ THE LABEL.

See Table 1.

Rates for pesticides are given as the maximum amount required to treat mature citrus trees unless otherwise noted. To treat smaller trees with commercial application equipment including handguns, mix the per acre rate for mature trees in 250 gallons of water. Calibrate and arrange nozzles to deliver thorough distribution and treat as many acres as this volume of spray allows.

Table 1. Recommended chemical controls for brown rot of fruit.

Pesticide	FRAC MOA[2]	Mature Trees Rate/Acre[1]
Aliette WDG	P07	5 lb—not more than 4 applications per year for all uses and no more than 20 lb/A
Phostrol	P07	4.5 pints
ProPhyt	P07	4 pints
copper fungicide	M01	Use label rate.

[1] Lower rates may be used on smaller trees. Do not use less than minimum label rate.
[2] Mode of action class for citrus pesticides from the Fungicide Resistance Action Committee (FRAC) 2018. Refer to ENY-624, Pesticide Resistance Management, in the *2019–2020 Florida Citrus Production Guide* for more details.