

Abstract

Inoculations were performed six to eight times in each of 10 prune orchards located in nine counties of California. In each inoculation, branches that bore 40 to 60 blossoms or 30 to 40 fruit were inoculated with conidial suspensions of *Monilinia fructicola*. Three inoculum concentrations and 14 to 16 h of humidity were used for each inoculation. All inoculated fruit were maintained on trees and harvested separately 2 weeks before commercial harvest. The incidence of latent infection (ILI) and percentage of branches with fruit rot (PBFR) were determined for each inoculation in each orchard. As the ILI increased, the PBFR also increased linearly. Five conditions that lead latent infection to fruit rot include (i) latent infection level; (ii) fruit developmental stage; (iii) inoculum concentration; (iv) total hours of relative humidity greater than 90% (hRH); and (v) total hours of dew period (hDEW) from mid-July to mid-August. Three levels of PBFR, 1, 5, and 10% were assigned, and threshold conditions that lead to these levels were determined based on the experimental results. The relative probabilities that lead latent infection to fruit rot (r_{PBFR}) at different fruit developmental stages were calculated. A preliminary decision support model to guide fungicide application was developed based on the above results. One of the four recommendations, safe, wait, check historical weather as a reference, and apply a fungicide immediately, could be provided based on the level of latent infection and the decision process developed through this study.