Prune Brown Rot Disease Management

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In 2001, we conducted inoculation experiments using *Monilinia fructicola,* the brown rot pathogen, in a 25-tree plot in a prune orchard of the Nickels Farm. This was part of research on prune brown rot disease management supported by the California Dried Plum Board. The overall objective of the research project was to determine the threshold conditions leading latent infection by *M. fructicola* to prune fruit rot expression. We selected 10 prune orchards (including the Nickels Farm) in nine counties of California from the south to north.

Inoculations of prunes in the orchards were conducted eight times each on March 21, April 4, April 14, May 9, May 31, June 21, July 10 and July 28. In each inoculation, we used three concentrations of *M. fructicola,* 5,000, 20,000, and 50,000 conidia/ml. For each inoculum concentration, we inoculated 6 branches with about 50 ml of spore suspension by spraying. Plastic bags were used to cover inoculated branches and to keep high humidity for 14 hours from 6 pm to 8 am. Fruit on inoculated branches were maintained until harvest. At harvest, fruit rot was first recorded per each branch and then all fruit were collected, brought to the laboratory, and the incidence of latent infections was determined by using the overnight freezing incubation technique (ONFIT).

Four conditions that lead latent infection to become fruit rot, included latent infection level, fruit developmental stage, inoculum concentration of the pathogen, and total hours of relative humidity (RH) greater than 90% (hRH) and dew period (hDEW) from mid-July to mid-August. Three levels of percent branches with fruit rot (PBFR), 1, 5 and 10%, were assigned, and conditions above each threshold leading to these levels of PBFR were determined based on our experimental results. Generally, infections late in the season were related to greater PBFR than those occurred early in the season. The inoculum concentration of 5,000 conidia/ml did not cause PBFR greater than 10% at any stage, while the concentration of 50,000 conidia/ml caused PBFR greater than 1% at all stages during the growing season. The thresholds of hRH leading to PBFR of 1, 5 and 10% were 24, 104, and 204 hours, respectively, and the threshold of hDEW leading to PBFR of 5 and 10% were 76 and 176 hours, respectively.

These results will be used in a risk assessment system that has being developed for prune brown rot.

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