Tree Fruit Diseases

Comparison of Capture of Ascospores of *Venturia pirina* with the Temperature of Wetness of Rains in Mendocino County, California, 1998

B.G. Zoller[1], S. Thomas[2] and J. Thomas[2]
[1]The Pear Doctor, Inc., Kelseyville, CA
[2]Thomas Brothers Orchards, Ukiah, CA

Keywords: *Venturia pirina*, ascospore, wetness, rain, pear

Ascospores of *Venturia pirina* were trapped during rain periods using roto rod samplers (Model 20, Sampling Technologies, Inc. Minnetonka, MN) as part of a disease management program in Mendocino County pear orchards in 1998. The 3-5 samplers were located 45 cm above ground level in commercial orchards and were baited with a 1 m diameter pile of random leaf litter 10 cm deep beneath the samplers in late winter.

Accumulated degree day readings were maintained at Hopland, CA, using a recording biophenometer (model TA 51, Omnidata International. Logan, UT) which made temperature readings at 10-minute intervals and converted the data to a degree day readout. Data of percentage spores trapped for the season vs degree days above 0°C for each year were compared with similar plots for percentage of mature asci vs degree days above 0°C in Figure 1B, p. 261 of Spotts, R.A. and Cervantes, L.A. 1994, Factors affecting maturation and release of ascospores of *Venturia pirina* in Oregon, *Phytopathology* 84: 260-264.

Temperature of the initial 6 hours of wetness during precipitation was determined using remote sensing equipment (Adcon Telemetry, Inc., Boca Raton, FL) in pear orchards in Hopland, CA, and Ukiah, CA. Linear and polynomial regression analyses of rainfall temperature vs the fraction of the seasonal total of spores trapped were performed using Sigmastat statistical software (Jandel Scientific, San Rafael, CA).

Results and Discussion

With the many rains occurring in 1998, it was possible to judge the effect of temperature of wetness on apparent pseudothecial productivity as measured by ascospore capture. There were increases with rain periods whose first 6 hours were at least 45°F. This productivity rose with wet periods whose outset temperatures averaged 50°F and above and declined with temperatures in the low 40s.

In order to see this relationship, rains beginning at night or early AM were judged to have spore discharge started at 7 AM the next morning for the beginning of the 6 hours. Rains occurring after 96% of the seasonal spore total had been captured were ignored, since a shortage of ascospores in the pseudothecia would lower productivity as measured by spore capture data (Figure 1).

Linear and polynomial regression analyses of rainfall temperature vs the square root of the fraction of the seasonal spore total captured during the precipitation yielded R square values of 0.294 and 0.34, respectively. Thus, approximately 30% of the variation in the data may be attributable to the rainfall temperature differences. This and the absence of capture data for dew periods may help explain lags and deviations in discharge from the Spotts and Cervantes maturation curve (Figure 2).

FIGURE 1

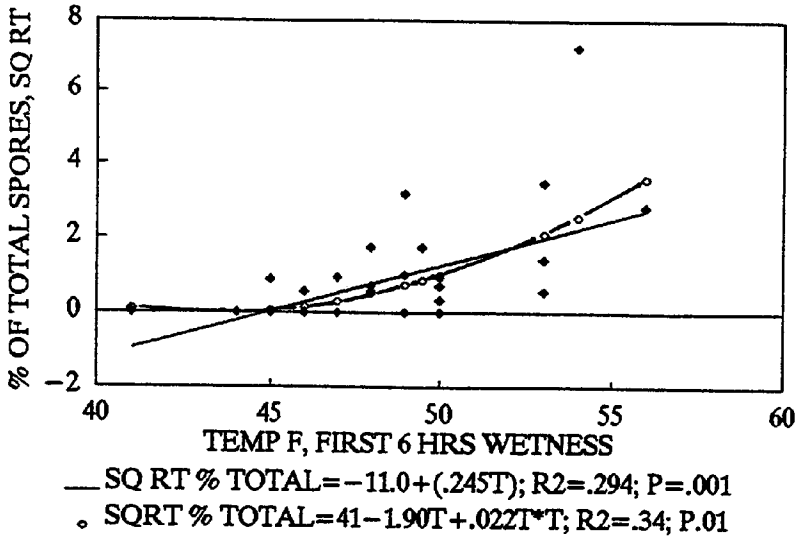

FIGURE 2