An Objective Method for Estimating Biocontrol of Hypovirulent and Virulent Cankers

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An objective method was devised for estimating biocontrol of cankers in hypovirulent plus virulent coinoculations. Canker lengths were determined biweekly during summer and early fall for virulent and virulent plus hypovirulent cankers located on the same tree. A hypovirulent plus virulent canker was deemed biocontrolled when its growth rate was significantly less ($p<0.05$) than the growth rate of its companion virulent canker.

This method was used in one experiment involving 13 hypovirulent plus virulent combinations replicated four times. Inoculations for the experiment were made from June 15 to June 19, 1978. Sixteen virulent plus hypovirulent cankers showed biocontrol in 1978. In 1979, four additional cankers showed biocontrol. On comparing growth rates for the two growing seasons, it was apparent that the additional biocontrol occurred after the first growing season. Of the hypovirulent plus virulent cankers showing bincontrol in 1978, 13 of 16 survived the 1979 growing season. Death of the stem where the cankers were located was due to natural virulent infections on basal stem parts in two of three cases. In the third case, the hypovirulent plus virulent canker did not grow rapidly until its companion virulent canker had girdled the stem and killed its distal parts.

Among the surviving biocontrolled cankers, there were four cases of possible "reversal" of biocontrol. Definite judgment on whether biocontrol occurred in these. experiments will depend CM results of pathogenicity tests of multiple isolates from each biocontrolled canker.