

Hypovirulence Offers Hope, Not
Laces

KUHLMAN, E. George.
Southeastern Forest Experiment Station
Research Triangle Park, North Carolina
27709

A recent Science (209: 597, 1979) article on the use of laetrile to control cancer ended by saying "Clinical trials on the drug conducted by the government are unlikely to resolve anything (in people's minds), because in the absence of a cure what people want is hope, not facts." At times hope for a cure can cloud scientific minds. In the late 1950's, a miracle cure for white pine blister rust was widely acclaimed without any experimental verification. Finally, experiments demonstrated there was no curative effect due to the treatment and a million-dollar program was quietly scrapped.

With hypovirulence in *Endothia parasitica* we have been offered a lot of hope but few facts to substantiate the premise that hypovirulence is the factor enabling European chestnut to survive in Italy and France. Grente has no published results to show that treatment with hypovirulent strains would increase survival of European chestnut over what would occur in check plots. Grente's hypothesis is further "supported" by subjective statements on an association of hypovirulent isolates with apparently healing cankers. In a Darwinian world of the survival of the fittest, hypovirulence appears to be at the bottom of a steep hill. With a reported rate of spread of 1 to 2 meters per year, hypovirulent isolates must compete with virulent isolates that spread 10 to 20 miles per year in the eastern U.S. forests. This translates into a rate that is 16,000 times slower. If the rate is increased by a thousand-fold, the hypovirulent forms will still take 16 years to cover a mile. Besides the slow rate of spread, hypovirulent forms are burdened with a reduced capacity for sporulation and survival. Dr. George Hepting has asked if the meek can inherit the chestnut world.

In the absence of solid experimental data to show that hypovirulence is controlling chestnut blight, an alternative hypothesis is that hypovirulence is the result of a less favorable host-pathogen relationship. Under these circumstances a resistant host or an unfavorable environment or both limit canker development. When this happens the pathogen is debilitated either by becoming infected with the hypovirulence factor or because the factor goes from a suppressed to an active state.