

Role of Double-strand RNA-based
Hypovirulence in Recovery of Chestnut
from Blight in Italy

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The specific role that double-strand RNA (dsRNA) based hypovirulence has played in recovery from chestnut blight over the past 30 years is unclear, primarily because many other factors may have been involved. Impressions gained from a month of examining chestnut stands in many parts of Italy include the following: The present density of chestnut sprouts in many mountainous areas of Italy is high and the incidence of blight cankers, given the density of the host, is low. Of several hundred cankers examined, abnormal, more or less superficial cankers with split, flaking bark predominate; typical lethal blight cankers are less abundant and normal cankers containing perithecia are present but appear to be rare. No perithecia were found on abnormal cankers. Samples from normal cankers yielded morphologically normal strains of *Endothia parasitica*. Bark samples from abnormal cankers yielded strains that were predominantly white in culture, mixtures of white and normal strains, or normal strains. All white strains tested contained detectable levels of dsRNA and white strains displayed a wide range of pathogenicities in dormant American chestnut in the laboratory. Nine vegetative compatibility groups have been found so far among the isolates from Italy.

The relative absence of the ascospore stage, reducing gene recombination and airborne inoculum; the apparently small number of vegetative compatibility groups, minimizing obstacles to transmission of dsRNA; and unknown effects of host species and environment may have contributed to recovery by permitting dsRNA-based hypovirulence to become established and well distributed within the *Endothia parasitica* population in Italy. Extensive studies would be required to determine the roles of individual components of this complex interaction between host, parasite, pathogen(s) of the parasite, and environment. Agents conferring hypovirulence in the Italian isolates appear to eliminate the capacity of the fungus to produce the sexual stage without eliminating the capacity of the fungus to survive. Since the abundance of the sexual stage in North America appears to be an important obstacle to control of blight here, these agents may be most useful for biocontrol in North America.