DEVELOPMENT OF A SAMPLING SYSTEM FOR *ARMILLARIA* RHIZOMORPHS IN MIXED OAK STANDS: A PROGRESS REPORT

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ABSTRACT

The assessment of the problems caused by gypsy moth is dependent on a number of characteristics of a forest stand. One of the main impacts of defoliation is the mortality of standing trees. Mortality is seldom caused directly by defoliation, but is usually associated with a secondary agent which attacks the tree in its weakened condition. The shoestring root rot organism, *Armillaria* spp. (probably *A. gallica*), is one of the most important of the secondary agents after defoliation . *Armillaria* is present in large quantities after defoliation episodes. Its abundance is correlated with tree mortality in defoliated stands. Preliminary studies found differences in the presence and abundance of rhizomorphs in the soil between undisturbed stands and stands defoliated previously by insects. Rhizomorph distribution within the plots was uniform in the undisturbed stand, but was significantly greater near dead trees in the defoliated stands. Greater rhizomorph abundance near recently dead trees or stumps may have important implications for management decisions in the presence of gypsy moth infestations. Total rhizomorph abundance was greater on plots defoliated 5 years before sampling than on more recently defoliated plots, and least on undefoliated plots. Overall rhizomorph density was highly correlated to rhizomorph density near dead trees.

This study was designed to test a sampling procedure to estimate the abundance of *Armillaria* rhizomorphs in forest stands and predict the vulnerability of the stand to *Armillaria* root disease after defoliation. It was superimposed on a silvicultural treatment designed to test the effectiveness of partial cutting on reducing the impact of gypsy moth defoliation on forest stands.

Eight stands of approximately 50 acres (20 ha) each have been selected for the silvicultural treatments, four with moderate susceptibility to defoliation and four with high susceptibility. Half of each stand will be thinned during the winter of 1989-90 in a manner which will reduce the susceptibility or vulnerability of that portion of the stand, producing four replications of each of four treatments, including the unthinned control stands. No stands have yet received defoliation, but gypsy moth is present, and defoliation is anticipated within one to three years. In the current study we established a systematic grid with ropes over each plot. At each grid point a judgment of the likelihood of high or low rhizomorph abundance was recorded, random samples of soil were removed from each of the strata for extraction of rhizomorphs, and estimates of rhizomorph abundance and sampling variance are being computed for each stratum and the plot.