

## Effect of imidacloprid on mycelial growth rate of soil fungi

Mary Washburn and Ashlee McCaskill, Ph.D.

Department of Biology, University of North Georgia, Dahlonega

### Abstract

The hemlock woolly adelgid (HWA) is a non-native parasitic insect that has threatened eastern hemlock (*Tsuga canadensis* (L.) Carrière) populations since its introduction to the United States in the 1950's (Souto, et al., 1996). One of the main treatment options for HWA infestations is the application of the pesticide imidacloprid via trunk and soil drench. Imidacloprid is a common pesticide used for many applications, but is known to cause ill-effects to honeybees, as well as both aquatic and terrestrial organisms, including mammals (Wismer, 2004). While these detrimental effects have been studied and are well-known, little research has been conducted to determine the effects imidacloprid has on other organisms, including the beneficial fungi present in the soil and surrounding areas. Soil fungi, such as *Rhizopus stolonifer* (Ehrenb.) Vuill. and *Schizophyllum commune* Fr., are very important decomposers in the forest ecosystem where the eastern hemlock resides. They are responsible for nutrient cycling and the decomposition of the detritus on the forest floor. We hypothesized that the detrimental effects of imidacloprid also extend to these fungi. To test this hypothesis, we made subcultures of *Rhizopus stolonifer* and *Schizophyllum commune*. We prepared potato-dextrose agar media for *Rhizopus stolonifer* and yeast malt agar media for *Schizophyllum commune*. We then added the effective concentration of imidacloprid (0.1%) to our experimental plates, measuring the mycelial growth of the fungi every 24 hours until the mycelium reached the edges of the plates. Our data shows a negative correlation between imidacloprid and mycelial growth. This suggests that not only is imidacloprid detrimental to organisms previously studied, but to the fungi that are integral to ecosystem health, and that alternatives to imidacloprid drenching should be sought out when treating HWA infestations.