

Application of Spent Mushroom Compost (MC) in the Field To Increase Health of Fraser Fir Christmas Trees

Submitted by

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We used the AMI/PDA funds, in conjunction with other funds, to establish 40 field research plots at Penn State Berks Campus (Reading, PA). A deer fence was erected around the plots and approximately 1,000 Fraser fir seedlings planted. Total plot area planted was 76m x 76m (305 linear m along the perimeter) or 0.6 ha, containing 40 plots arranged in two blocks of 20. Within each block, plots were 3m wide x 14m long, and equally spaced. There are 3m-wide grass alleys in between each experimental plot, and a larger 9-m wide alley separates the two blocks. Alleys will be mowed routinely.

Each plot contains 17 evenly spaced Fraser fir seedlings (9 on the left side and 8 on the right side). Five MC treatments were applied to each block of 20 plots, with each treatment replicated 4 times (*e.g.*, 5 treatments x 4 reps = 20 plots), arranged in a randomized complete block design. The 5 treatments are: 1) native soil amended with 20 tons fresh mushroom compost per acre and surfaced applied; 2) 20 tons fresh mushroom compost per acre and roto-tilled in; 3) 40 tons fresh mushroom compost per acre and surfaced applied; 4) 40 tons fresh mushroom compost per acre and roto-tilled in; and 5) untreated and unamended native soil control.

At the end of the 2012-growing season, we will measure Fraser fir seedling height, diameter at soil line, color of current needles, overall vigor, and will collect 2012 needle samples for chemical analyses. We will also collect mineral and organic soil for both chemical and physical analyses, and conduct the initial data analyses. All data will be subjected to analysis of variance, and the 5 treatment means will be compared using Fisher's least significance difference test at $P < 0.05$. If funding is available in the future, we will conduct annual evaluations for several years.