Saving the North American Ash Tree, Year Two: Establishing Metarhizium anisopliae as an Endophyte in Fraxinus uhdei

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In the last ten years, twenty five million ash trees have been destroyed by the Emerald Ash Borer; the most destructive invasion by a pest to date. This study looks to save vulnerable ash trees by establishing a soil-inhabiting and exclusively insect-pathogenic fungi as a Fraxinus uhdei symbiont. In a previous study, fungal strains from the family Metarhizium anisopliae were determined for the first time to be virulent against Agrilus planipennis larvae. This year's study shows for the first time, high virulence in Agrilus planipennis adults during bioassay trials. Agrilus planipennis adults were exposed to inoculated filter paper for 24 hours before relocation to rearing containers. Time of death and sporulation of beetles was recorded. Results clearly demonstrated Metarhizium's high virulence against Agrilus planipennis beetles. Endophyte compatibility was determined after cuttings were inoculated via a root soak and foliar spray. Cuttings were destructively sampled at 7 day intervals to determine presence of fungi. Tissue and stem samples were plated on selective agar medium and incubated for 14 days. Fungal growth was visually analyzed and PCR was performed on samples preserved at -80 degrees Celsius. Proportion of positive samples and p-values from hypothesis testing statistically showed that Metarhizium was present in the stem of F. uhdei cuttings throughout the observed period of 35 days.

Awards Won:
Second Award of $2,000