

Effects of imidacloprid for hemlock woolly adelgid (*Adelges tsugae*) control on non-target pollinator communities in eastern hemlock (*Tsuga canadensis*) forests in southwest Nova Scotia

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Hemlock woolly adelgid (*Adelges tsugae*), is an invasive pest that threatens eastern hemlock and ecologically significant old growth forests in Nova Scotia. In the United States, the impacts of *A. tsugae* are controlled with the neonicotinoid imidacloprid, usually applied by soil drench or basal bark spray. There has been considerable research on the impacts of imidacloprid on non-target bee pollinators in agroecosystems but very little in forest ecosystems. We are assessing non-target effects of imidacloprid basal bark sprays on two pollinator groups, bees (Hymenoptera: Apoidea: Anthophila) and flower flies (Diptera: Syrphidae), in hemlock forests. Four field sites were established in southwestern Nova Scotia in 2021 to sample pollinator communities in treated and untreated stands using pan traps, blue vane traps, and sweep netting over two years in 2021 and 2022. Pollen and plant material were collected from treated sites and examined for residues of imidacloprid and its metabolites to quantify potential exposure to pollinators. We collected a total of 561 specimens (366 flower flies; 195 bees) in 2021 and 918 specimens (565 flower flies; 353 bees) in 2022. Preliminary results revealed that bumble bees (*Bombus*) were the most abundant bees (77%) in these stands. Notably, *B. terricola*, listed as “Special Concern” under the Species at Risk Act, was identified at all field sites, further underlining the ecological value of these unique hemlock-dominated ecosystems. We plan to compare diversity, abundance, and species assemblages between treated and untreated stands and between sample years in treated (pre- vs. post-treatment) and untreated controls.

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