

# SPATIAL AND TEMPORAL DISTRIBUTION OF IMIDACLOPRID IN EASTERN HEMLOCK

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## ABSTRACT

Enzyme-linked immunosorbent assay (ELISA) and gas chromatography/mass spectrometry (GC/MS) techniques were used to measure imidacloprid and metabolite concentrations in xylem fluid extracted from eastern hemlock (*Tsuga canadensis*) trees treated in the spring or fall with soil or trunk applications of the systemic insecticides Merit® 2F and IMA-jet® (5%). Background chemical interferences in ELISA, were eliminated by a 1:20 dilution of extracts with water. Xylem fluid samples were collected from 64 eastern hemlock trees at each of two sites. These samples were collected at 3, 6, 9, 12, and 15

weeks after treatment from within the crown. Twelve branches within the crown representing three heights and four cardinal directions were clipped and xylem fluid extracted using a pressure chamber. To date, imidacloprid and its metabolites have only been detected in the xylem fluid of trees whose trunk was injected with IMA-jet®. Imidacloprid initially detected at 3 weeks, has sustained levels through 15 weeks of sampling. Height and cardinal direction did not appear to effect results through there was considerable variability among samples.