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Environmental Toxicology and Chemistry

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Mowing mitigates bioactivity of neonicotinoid insecticides in nectar of flowering lawn weeds and turfgrass guttation

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Abstract

Systemic neonicotinoid insecticides are used to control turfgrass insect pests. The authors tested their transference into nectar of flowering lawn weeds or grass guttation droplets, which, if high enough, could be hazardous to bees or other insects that feed on such exudates. The authors applied imidacloprid or clothianidin to turf with white clover, followed by irrigation, and used liquid chromatography-tandem mass spectrometry (LC-MS/MS) to analyze residues in clover blooms that were directly sprayed during application or that formed after the first mowing. Imidacloprid residues in guttation fluid from field-grown creeping



excludes toxicity. Nectar from directly sprayed clover blooms contained 3475 ng/g to 6588 ng/g imidacloprid or 2882 ng/g to 2992 ng/g clothianidin and was acutely toxic to *Orius*. Residues were 99.4% to 99.8% lower in nectar of blooms formed after mowing, and nontoxic to *Orius*. Imidacloprid residues in turfgrass guttation averaged 88 ng/g at 1 wk after treatment, causing some intoxication of *Orius*, but declined to 23 ng/g within 3 wk. Systemic transference of neonicotinoids into white clover nectar and creeping bentgrass guttation appears relatively low and transitory. The hazard to nontarget insects via nectar of flowering weeds in treated lawns can be mitigated by adhering to label precautions and mowing to remove blooms if they are inadvertently sprayed. *Environ Toxicol Chem* 2015;34:127–132. © 2014 SETAC

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