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Protecting the Use of Neonicotinoids for Forest Pest Control

A policy statement approved by the Executive Committee of the National Association of State Foresters

Executive Summary

The National Association of State Foresters opposes further restrictions of neonicotinoid pesticides for forest uses, as these pesticides are crucial to our endeavors to combat destructive invasive insects and preserve the health of North American forests.

The purpose of this paper is to declare the NASF's position to support the continued use of the neonicotinoid insecticide class for the protection of critically imperiled tree species despite increasing public demand for stricter regulations that reduce the use of neonicotinoid insecticides.

Inappropriate use of neonicotinoid insecticides can negatively affect non-target organisms, such as insect pollinators. Strict adherence to the elements on the insecticide label is paramount for their protection. While pollinators are a critical component of all forest ecosystems, the protection of keystone tree species from invasive pests is vital to preserving forest health. Appropriate application of neonicotinoids to protect threatened forest resources poses little risk to pollinators.

The National Association of State Foresters supports the continued use of these insecticides on critically imperiled tree species. Removing this management option, in the absence of effective alternatives, will have irreversible long- term impacts on North American forests.

Protecting the Use of Neonicotinoids for Forest Pest Control

Neonicotinoid insecticides are used globally to suppress a variety of tree, crop, and ornamental plant insect pests. Neonicotinoids have been implicated as part of a suite of contributors to widespread pollinator population decline; however, forest health in eastern North America is currently being preserved by the ecologically sound use of neonicotinoid pesticides. Invasive forest pests, such as the hemlock woolly adelgid, *Adelges tsugae* (Annand) (HWA) and the emerald ash borer, *Agrilus planipennis* (Fairmaire) (EAB), threaten to eliminate entire species and reduce the ecosystem services of our eastern forests. Neonicotinoids such as Imidacloprid and dinotefuran are essential tools for the suppression of these invasive pests and the resulting protection of our forest resources.

Hemlock woolly adelgid has spread throughout much of the natural range of eastern hemlock since its introduction to Virginia in the 1950s. Millions of hemlock trees have been killed, devastating associated terrestrial and aquatic habitats. Eastern hemlock, a keystone species in eastern North American forests, provides a unique set of ecological services. Forest soil properties are affected by hemlocks (Jenkins et al. 1999), resulting in distinctive hemlock-associated floral and faunal communities. Hemlocks stabilize stream banks and shade streams, both of which are necessary for the survival of aquatic organisms. Unique aquatic insect and canopy arthropod communities are associated with hemlock forests (Snyder et al. 2002, Dilling et al. 2007). The loss of this species will have many negative cascading environmental effects on the forest ecosystem, including decreased water quality and the shift of these characteristic hemlock forest habitats into analogous forest types.

Emerald ash borer, first detected in Michigan in 2002, has killed millions of ash trees and continues to spread throughout the entire range of ash in North America. As ash species are common components of forests and urban landscapes, the demise of ash would have disastrous long-lasting ecological and economic impacts. Ash species are often dominant in overstory canopies and are present in over 25 forest cover types ranging from upland hardwoods to riparian areas and swamps (Erdmann et al. 1987, Burns and Honkala 1990).
Canopy cover in many urban forests are 10-40 percent ash (Coalition for Urban Ash Tree Conservation 2011). This large ash component contributes to storm water mitigation, improves air quality, increases shade, and adds aesthetic value to urban landscapes. Predicted EAB- induced economic costs for insecticide treatment, ash removal, and tree replacement in urban forests are staggering, ranging from $10-20 billion (Kovacs et al. 2010).

Neonicotinoids are critical to the effective management of these invasive forest pests. Imidacloprid, a common systemic neonicotinoid, can successfully suppress both HWA and EAB populations. Once absorbed by the plant, imidacloprid metabolizes into an insecticidal metabolite. The additive effect of imidacloprid and its insecticidal metabolite increases efficacy and longevity of insecticide treatments. Since hemlocks do not lose their foliage each year, insecticide residues persist resulting in HWA control for up to seven years after one imidacloprid application (Benton et al., 2015). Imidacloprid is important in EAB suppression programs, resulting in financial benefits for municipalities devastated by EAB. Chemically treating landscape ash is often less costly than hazard tree removal, and treatment may even be used as tool to delay expensive removal costs and safety hazards over multiple years through treat-until-removal methods. According to the imidacloprid product label, the insecticide is “highly toxic to bees exposed to direct treatment or residues on blooming crops/plants or weeds” (Bayer 2015). The exposure of pollinators to imidacloprid via translocation to blooms, drift, and direct spray is concerning, and reasonable measures should be taken to reduce pollinator exposure by these established routes. Hemlock and ash, however, are both wind-pollinated, and thus their pollen may not be a significant food source for bees and other pollinators. The soil and trunk application methods used in forested settings present a negligible risk to pollinators. While imidacloprid is often dispersed into air or on foliage in agricultural settings, this is not the case in forest settings. There is little risk of direct contact or indirect exposure of pollinators to imidacloprid when being used for HWA or EAB suppression.

In addition to minimal pollinator risks, non-target assessments of imidacloprid use in forests has shown no negative impacts to aquatic insects (Churchel et al. 2012, Benton 2016) and minimal impacts to soil and canopy arthropods (Knoepp et al. 2012, Dilling et al. 2009). The benefits of imidacloprid treatment far outweigh the slight risks, in comparison to the complete loss or degradation of arthropod habitat if hemlocks were left untreated.

Further restricting the low-risk use of neonicotinoids for forest pest suppression would be devastating to foresters, land managers, and home owners, leaving them with little to no options to protect natural and urban forests from these invasive insect threats.

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