



Treated cotton seeds. Image courtesy of Scott Stiles, University of Arkansas System Division of Agriculture, May 1, 2015. <https://creativecommons.org/licenses/by-nc/2.0/>



POLICY BRIEF: NEONICOTINOIDS AS RESTRICTED-USE PESTICIDES

SUMMARY

Pollinators are essential to maintaining modern agriculture, both conventional and organic. It is estimated that one third of all the food we eat was produced through pollination by animals like honeybees, birds, and butterflies. Neonicotinoids – a class of highly water-soluble systemic pesticides applied through seed coating and contained within the plant’s vascular tissues, nectar, and pollen - and other pesticides have threatened the stability of pollinator communities through their widespread use in agriculture, commercial pest control, and consumer use. Consumer misuse, while not the sole source of neonicotinoid contamination, contributes not only to the decline in pollinator populations, but can also contaminate surface water and threaten aquatic wildlife. While the EPA provides guidelines for what they and industry consider ‘safe’ use of neonicotinoids, researchers are now finding these guidelines to be far too weak to adequately protect pollinators and other invertebrates. In response, Maryland passed legislation in 2016 that restricts

neonicotinoids to use by qualified professionals, farmers, and veterinarians, thereby reducing the amount of neonicotinoid contamination and subsequent pollinator decline that originates from consumer use and misuse. Because North Carolina’s economy depends on its \$70.5 billion agricultural industry and \$93 million commercial fishing industry, it is imperative that the state adopt policies that classify neonicotinoids as restricted-use pesticides.

MONITORING CONCERNS

The Bee-Informed Partnership (BIP) – the primary source of information on honeybee decline - is a voluntary survey of US beekeepers, which asks for their opinion as to the cause of annual losses in their hives. The survey minimizes the role of pesticides, and inflates the contribution of the Varroa mite in bee deaths by regularly decreasing thresholds for fatal Varroa infestation. Additionally, because the survey offers testing for a cost-prohibitive fee (\$844 for pesticides), the responses of the survey alone may be much lower than the actual losses.

Policy decisions informed by the BIP may divert resources and time toward overt contributors like Varroa, while ignoring the underlying causes, such as pesticides.

THREATS TO AQUATIC SPECIES

Neonicotinoids in surface water have demonstrated adverse effects on a wide range of aquatic species,¹ which, in North Carolina, could adversely affect commercially important species such as the blue crab, as well as endangered species. Because of the high water-solubility of neonicotinoids, even when used as directed, they are difficult to contain to the area of use, particularly after heavy rainfall. This threat is concerning, as the commercial fishing industry generates significant income for the state, and adverse effects of neonicotinoids on blue crab have been documented.²

CONTAINMENT PROBLEMS

As mentioned previously, the solubility of neonicotinoids makes them extremely difficult to contain to one area. While pesticide manufacturers maintain, in their defense, that neonicotinoids are not a



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danger to pollinators if used as directed by the product label, recent research has found that despite directed use, neonicotinoids – specifically clothianidin – was detected in non-target plants and honey in both organic and seed-treated farming operations.³ Concentrations of clothianidin found in nectar that bees collected had concentrations as high as 1.6 ppb, and samples of plant tissue had concentrations of 14 ppb, both well above EPA guidelines (Fig. 1).³ This issue also presents an economic difficulty for organic farmers, as pesticide-free production is the primary selling point for their products.

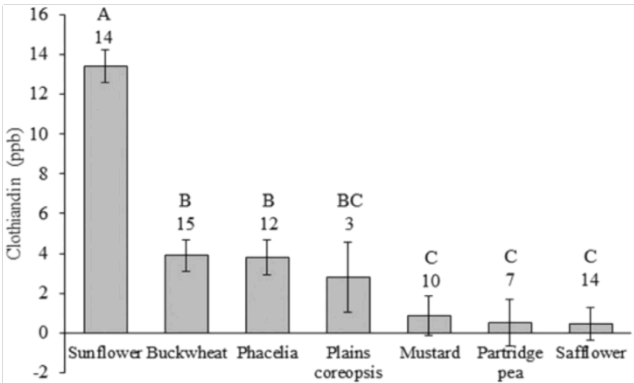


Figure 1. Concentrations of clothianidin in leaf tissues (mean ± SE). Letters above bars show significant differences between plant species and numbers represent the number of site-years in which a particular species was analyzed.³

ANALYSIS

The compound threats that neonicotinoids pose could be extremely costly to the state, and as such, present economic as well as environmental concerns for North Carolina. Agriculture generates approximately \$70 billion for North Carolina annually,⁴ and the state’s blue crab industry generates approximately \$30 million annually, while the entire NC commercial fishing industry generates approximately \$95 million.⁵ The Maryland Pollinator Protection Act, which reclassified neonicotinoids as restricted-use pesticides (RUPs), limiting their use to farmers, qualified applicators, and veterinarians, provides a model for North Carolina consumer use regulations. A reduction in the use of neonicotinoids through RUP classification could prevent or at least reduce devastating economic losses as well as significant harms to endangered species and other wildlife.

RECOMMENDATIONS

- 1) In order to prevent previously mentioned economic losses and environmental degradation, we recommend that neonicotinoids be reclassified as Restricted Use Pesticides (RUPs).
- 2) Allocate sufficient funding to Department of Environmental Quality to monitor for neonicotinoids, which are currently not monitored.
- 3) Allocate sufficient funding to enforce these restrictions. Although NC law forbids pesticide misuse, the current lack of enforcement makes misuse a low-risk activity for consumers.

WORKS REFERENCED

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2. Osterberg et al. (2012). "Acute toxicity and sub-lethal effects of common pesticides in post-larval and juvenile blue crabs, *Callinectes sapidus*." *Journal of Marine Biology and Ecology*.
3. Mogren, Christina L., and Jonathan G. Lundgren. "Neonicotinoid-contaminated Pollinator Strips Adjacent to Cropland Reduce Honey Bee Nutritional Status." *Scientific Reports* 6 (July 14, 2016): 29608. doi:10.1038/srep29608.
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Toxic Free NC's mission is to engage North Carolinians in the transition to a toxic-free society through initiatives that promote human and environmental health.

