



# Stewardship Guidelines and Best Management Practices for HOME AND RESIDENTIAL USE OF NEONICOTINOID INSECTICIDES

May 2019

**m** DEPARTMENT OF  
AGRICULTURE

For decades, neonicotinoid insecticides have been widely used to manage insects on agricultural crops, residential and commercial landscapes, lawns (turf), and household plants. When used properly and with good judgement, these insecticides can be highly effective and pose minimal risk to humans and other organisms. However, neonicotinoids have the potential to harm beneficial insects, including pollinators, if certain precautions are not taken.





## BACKGROUND

Neonicotinoid insecticides include a variety of active ingredients including: acetamiprid, clothianidin, dinotefuran, imidacloprid, and thiamethoxam. These ingredients are combined in different ways to create a variety of formulations and products to control household, yard and garden, and turf insect pests. Neonicotinoid insecticides can control a wide range of pests that live in the soil or on plants. They are controlled by direct contact with the insecticide or by ingestion, which can occur when the insect feeds on the treated plant. Neonicotinoid insecticides are systemic, which means the insecticide can move into different parts of the plant. As insects feed on the plant, they also take in the insecticide.

Two of the key benefits of neonicotinoid insecticides are that they are effective at very low concentrations and are often less toxic to mammals (including humans) than other available insecticide chemistries such as organophosphates and carbamates. (*Reference 1*)

Insect pollinators (bees, flies, wasps, butterflies, etc.) play an important role in the pollination of agricultural and wildland plants throughout Minnesota and the United States. In the last few decades, however, numerous observations have noted that insect pollinator populations, particularly bees, are declining in the U.S. These declines have been attributed to a variety of factors including lack of habitat, lack of foraging sites, diseases, parasites, and pesticides, including neonicotinoid insecticides.

A variety of neonicotinoid products are available to homeowners to control insect pests in Minnesota, but unfortunately they can harm both the intended pest as well as beneficial insects – such as pollinators. Pollinators can be exposed to neonicotinoid residues through several pathways including contaminated plant parts (pollen, nectar, and spray residue on leaves), pesticide drift, and contaminated surface water. Exposure to neonicotinoid residues can, in turn, impact their behavior, growth, and reproduction. Minimizing these unintended or non-target exposures to insect pollinators is an important goal when applying pesticides including insecticides. The following guidelines are designed in cooperation with the University of Minnesota Extension and others to promote awareness and provide guidance to homeowners so that they can safely use insecticide products containing neonicotinoids, and pesticides in general, for pest control in their yards and gardens.



# BEST MANAGEMENT PRACTICES (BMPs) FOR HOME AND RESIDENTIAL USE OF NEONICOTINOID INSECTICIDES

While many of the listed BMPs associated with pesticide use are voluntary, some BMPs refer to mandatory statements on the product label (e.g., apply only at labeled rates, do not apply directly to water, read and follow the product label, etc.). Depending on the product, these mandatory statements can be found in the “Environmental Hazards,” “Use Restrictions,” or “Directions for Use” etc., sections of the product label. Pesticide labels provide directions on how to mix, apply, store, and dispose of pesticides. Using pesticides in a manner inconsistent with their labeling is a violation of federal law. Everyone, including homeowners, is required to carefully review and follow the insecticide product label. In addition, it is highly recommended that homeowners follow the voluntary BMPs to reduce the potential impact of neonicotinoid and other insecticide products on insect pollinators and their habitat. (Reference 2)

## BEST MANAGEMENT PRACTICES RELATED TO THE USE OF NEONICOTINOID AND OTHER INSECTICIDE PRODUCTS INCLUDE

### Regular Scouting for Insect Pests

Inspect (scout) the lawn, flowers, trees, shrubs, and other landscape plants for the presence of insect pests regularly throughout the year. When an insect pest is discovered, accurately identify the insect and carefully match insect pest control options with the identified insect pest. Consult with University of Minnesota Extension to help in identifying insect pest. Keep a record of pest infestations, as well as insecticide treatments and their effectiveness.

### Understand and Follow Pest Thresholds

Apply insecticides only when necessary and use insecticides to prevent insect pests from causing unacceptable levels of damage. The simple presence of an insect pest may not justify the use of an insecticide. Pest thresholds (i.e., the density of pest at which a control treatment is required) are developed by incorporating several factors such as economics, aesthetics, and environmental impacts; however, thresholds have not been determined for most landscape plants and can be subjective. As a result, regular scouting and a thoughtful, independent assessment of the acceptability of the damage is usually required to determine whether control is justified and the best method to use. Consult the University of Minnesota Extension for the pest thresholds for yards and gardens. (Reference 3)

### Create Pollinator Habitat

Include pollinator attractive plants that have not been treated with neonicotinoid, or other insecticides, in the landscape to increase foraging opportunities for pollinators. Work with

garden centers and nurseries to understand pesticide use during plant production, and to select and install landscape plants that will benefit pollinators. According to the Minnesota nursery label and pollinator statute, systemic insecticide treated plants may not be labeled or advertised as beneficial to pollinators if certain conditions exist (Reference 4). A list of pollinator attractive plants can be found in the Minnesota Department of Agriculture (MDA) publication, *Insect Pollinator Best Management Practices for Minnesota Yards and Gardens*. (Reference 5)



### Adopt Non-Chemical Methods of Pest Control

The MDA encourages homeowners to use non-chemical methods including prevention (sanitation, mulch), mechanical (hand removal), and cultural (timely watering and fertilization, promoting populations of beneficial insects) methods to control insect pests. When the populations of insect pests are low, insect pests may be controlled naturally by beneficial insects that are predators.





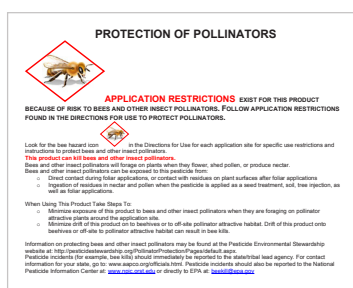
The adoption of alternative methods may reduce the need for insecticides to control insect pests in yards and gardens.

### Consider Using Insecticides with Lower Toxicities

When possible, select insecticide products with low toxicity to pollinators. In some cases, certain insecticide formulations (e.g., granular formulations) may be less likely to move off-target and may be safer for applicators, neighbors, and non-target organisms including pollinators. Consult the MDA Pesticide Management Division or the University of Minnesota Extension for assistance in the selection of insecticides with low toxicity that can be used on lawns and other landscape plants. (Reference 5)

### Read the Product Label for Statements Related to Pollinators

Insecticide users must carefully read the product label and follow the requirements for pollinator protections – the label is the law. Several insecticide products have statements on bee protection either under “Environmental Hazards” or in a “Bee Advisory” box. Label statements may include “this active ingredient is toxic to bees.” Look for the “bee sign” on the product label.



### Look for Foraging Bees Prior to Insecticide Applications

Do not apply insecticides when pollinator attractive plants are blooming or bees are foraging in the garden. Several

insecticides have a “bee sign” on the label (see picture) and include restrictions like “Do not apply this product while bees are foraging.” Never directly spray flowers or foraging bees and other pollinators or other beneficial insects. Mow weedy turf prior to making insecticide application. Where the product label allows, consider spraying in the early morning or evening when pollinators foraging activity is generally lower. (Reference 5)

### Use Spot Treatments

Reduce insecticide use by spot treating insect pests if the insect pest population is limited to one location and is not likely to spread throughout the property. Limit the use of insecticide-fertilizer combination products as these products prevent spot treatment. Spot treatment reduces the impact on pollinators and their environment by avoiding blanket applications and the unnecessary application of insecticides to non-infested areas.

### Inspect Application Equipment Regularly and Carefully

Regularly inspect spray and other pesticide application equipment for any wear and tear, and carefully replace or repair when needed. Use an anti-siphon (backflow) device while applying insecticide products using a water hose.

### Apply Insecticides at Labeled Rates

Never apply more insecticide than the label allows or apply insecticides more frequently than the label allows. Applying insecticides at the labeled rate promotes effective control, helps prevent the reoccurrence of pests, and reduces the chances of harm to people and the environment. Apply pro-rated application rates depending on the size of the area



(lawn or tree) you are intending to treat. Using pesticides outside the boundaries specified on the label violates the law and increases the chances for injuries to non-target organisms and the environment.

### Follow Insecticide Drift Management Practices

Minimize the movement of insecticides by following the label directions under “Spray Drift Management”. For example, select the proper spray nozzle and spray application height, and only apply pesticides when the weather conditions are



favorable (wind speed and direction, not applying pesticides during temperature inversions, etc.). Avoid applying pesticides if rain is expected soon after application (as indicated on the label) and, when applicable, use insecticide

formulations that are less prone to volatilization. Volatilization is the process through which the chemical evaporates or vaporizes and is able to move in the air.

### Avoid Using the Same Product Repeatedly

Do not use the same product or products with the same active ingredient or mode of action to control an insect pest repeatedly. Frequent use of the same active ingredient can promote insecticide resistance. Consult the University of Minnesota Extension for information on insecticide products with different active ingredients.

### Inform Neighbors Regarding Insecticide Applications

Always place signs in your yards immediately after insecticide application



to let neighbors know a pesticide has been applied and to help keep children and pets out of treated areas. Place signs where they will be clearly visible before entering treated areas and include the reentry interval specified on the product label. (Reference 6)

### Clean Application Equipment Properly

Follow product label directions for cleaning application equipment. Clean pesticide equipment after each use. Check pesticide equipment for any leaks during cleaning. Dispose of leftover pesticide solution properly by following the label.

### Store Insecticides Properly and Safely

Follow the label for storage requirements. Store insecticide products in a safe and secure place. Keep insecticides in their original containers and placed in a secondary, leak-proof container to trap potential leaks. Keep insecticides out of the reach of children.

### Spread the Word

Share these BMPs with neighbors and others in your community to increase awareness regarding the proper use of insecticides. Communicate with neighbors who have beehives before applying insecticides. Homeowners are highly encouraged to contact the University of Minnesota Extension or the Pesticide & Fertilizer Management Division of MDA with any questions related to the proper use of insecticides in landscapes.

### Report Bee Death Incidents

The MDA investigates honey bees allegedly killed by pesticide poisoning. The MDA responds to formal and written complaints on bee death incidents related to pesticides. (Reference 7)





## REFERENCES\*

- 1 Review of Neonicotinoid Use, Registration, and Insect Pollinator Impacts in Minnesota  
[www.mda.state.mn.us/sites/default/files/inline-files/neonicreviewrpt2016.pdf](http://www.mda.state.mn.us/sites/default/files/inline-files/neonicreviewrpt2016.pdf)
- 2 Best Management Practices for Turfgrass Pesticides  
[www.mda.state.mn.us/turfgrass-best-management-practices](http://www.mda.state.mn.us/turfgrass-best-management-practices)
- 3 Insects  
[extension.umn.edu/insects](http://extension.umn.edu/insects)
- 4 Nursery Label/Pollinator Statue Revised  
[www.mda.state.mn.us/plants-insects/nursery-label-and-pollinator-statute-revised](http://www.mda.state.mn.us/plants-insects/nursery-label-and-pollinator-statute-revised)
- 5 Insect Pollinator Best Management Practices for Minnesota Yards and Gardens  
[www.mda.state.mn.us/sites/default/files/inline-files/pollinatoryardbmps.pdf](http://www.mda.state.mn.us/sites/default/files/inline-files/pollinatoryardbmps.pdf)
- 6 Warning Signs for Applying Pesticides to Turf  
[www.mda.state.mn.us/warning-signs-applying-pesticide-turf](http://www.mda.state.mn.us/warning-signs-applying-pesticide-turf)
- 7 Pesticide Investigation into Honey Bee Death  
[www.mda.state.mn.us/beekillcompensation](http://www.mda.state.mn.us/beekillcompensation)

---

*\*References were last accessed on 5/20/2019*

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider.