

## New EPA and Minnesota labeling laws for protecting bees

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This information is relevant to professional nursery and greenhouse growers. A shorter version is available for distribution to garden center visitors.



### New federal and state legislation on conserving bees

In March 2014 the EPA has released new bee protection guidelines on neonicotinoid insecticide products (imidacloprid, dinotefuran, thiamethoxam, and clothianidin) to protect bees and other insect pollinators. The bee icon signals that the pesticide has potential to harm bees. The language in the new bee advisory and directions for use sections of the label explains application restrictions to protect bees. This information is presented below in a separate section

In addition, as of July 1 2014, Minnesota has a new plant labeling law in effect to protect pollinators. The new law requires plants that are sold as bee friendly cannot have certain insecticides used during their cultivation. This information is presented below in a separate section.

### Why are conserving pollinators and other beneficial insects important to Integrated Pest Management (IPM)

The conservation of beneficial insects, that includes bees, insect predators, parasitic wasps, and butterflies, is an essential part of Integrated Pest management (IPM) programs. IPM promotes multiple tactics to manage pests and to suppress the population size below levels that will damage the plant. IPM tactics include cultural control, sanitation, biological control, and finally the use of insecticides. IPM recognizes that the few remaining pest insects will support beneficial predators and parasitic wasps. Use spot treatments of contact insecticides, not systemic insecticides, which will help conserve pollen and nectar feeding beneficial insects.

Flowers that open after spraying with contact insecticides do not contain insecticide residue. Use contact insecticides, such as bifenthrin, cyfluthrin, flonicamid, and spinosad (less toxicity 3 hrs post spray when dried). Toxicity lasts 1-3 weeks. Do not spray flowers and foraging bees as most insecticides are harmful to insects. However, flowers that open after systemic insecticides are sprayed can contain the insecticide residue in pollen and nectar for months.

There are few systemic insecticides, while there are many systemic herbicides and fungicides. Systemic, neonicotinoid insecticides are the most widely used insecticides in the world, due to their low mammalian toxicity and the ability of the insecticide to move systemically from soil into the entire plant, including pollen and nectar. Treatment methods include seed treatments, foliar sprays, soil (granular and liquid) applications, trunk drenches, and trunk-injections. Flowers that open after systemic insecticides are sprayed can contain the insecticide residue for many months in both the leaves and pollen and nectar.

There are six neonicotinoid active ingredients, imidacloprid, dinotefuran, thiamethoxam, and clothianidin, of which acetamiprid and thiacloprid are the least toxic to bees. There is another systemic insecticide, fipronil, that is used around structures that is also toxic to bees. You will find these active ingredients listed on the insecticide label in small print.

Neonicotinoid systemic insecticides have been implicated in the decline of bees, butterflies, and other beneficial insects. The European Union

suspended the use of neonicotinoid insecticides from 2014-2016 on crops and plants that bees' visit. The concern was the residue in pollen and nectar and their negative effects on survival and foraging behavior of bees. The neonicotinoid class of insecticides is highly toxic to bees and kills bees at around 180 ppb in flower nectar or pollen. However, sublethal doses of neonicotinoid insecticide starting around 5 ppb, cause bees to lose navigation and foraging skills. The longevity and amount of the neonicotinoid in the pollen and nectar will depend on application method, concentration applied, and binding capacity of the soil.

The use of neonicotinoid insecticides as trunk injections and soil drenches for ash trees is important to slow the spread of the exotic, invasive Emerald Ash Borer and other invasive pests. As bees do not collect ash pollen in quantities, the risk to bee pollinators is low. In contrast, the use of neonicotinoid insecticides on flowering garden plants, shrubs and trees, including linden and basswood trees can potentially kill bees and beneficial insects that utilize the flowers for pollen and nectar. It is wise to avoid using systemic neonicotinoid insecticides on flowering plants that bees visit regularly. Instead use spot treatments of contact insecticides.

### **Creating a federal strategy to promote the health of honey bees and other pollinators**

As of October 2014 a federal task force suggests that systemic insecticides should not be used on bee friendly plants according to the 51 page document entitled "Supporting the health of honey bees and others pollinators" developed by the council on environmental quality and GSA to address the requirement of the presidential memorandum of June 20 2014. The wording on page 15 states "5. Acquire seeds and plants from nurseries that do not treat their plants with systemic insecticides". You can find the document at the url:

[http://www.whitehouse.gov/sites/default/files/docs/supporting\\_the\\_health\\_of\\_honey\\_bees\\_and\\_other\\_pollinators.pdf](http://www.whitehouse.gov/sites/default/files/docs/supporting_the_health_of_honey_bees_and_other_pollinators.pdf)

The presidential memorandum of June 20 2014 states that:

"Given the breadth, severity, and persistence of pollinator losses, it is critical to expand Federal efforts and take new steps to reverse pollinator losses and help restore populations to healthy levels. ...Therefore, by the authority vested in me as President by the Constitution and the laws of the United States of America, I hereby direct the following: .... hereby established the Pollinator Health Task Force, to be co-chaired by the Secretary of Agriculture and the Administrator of the Environmental Protection Agency. In addition to the Co-Chairs, the Task Force shall also include".... members from the various federal departments. ...The mission is to develop a pollinator research action plan, public education plan, increase pollinator habitat, and collect and share data on pollinator issues.

You can find the document at the url: <http://www.whitehouse.gov/the-press-office/2014/06/20/presidential-memorandum-creating-federal-strategy-promote-health-honey-b>

### **The new EPA bee icon and bee advisory box on labels**

As of March 2014 the EPA has added the new "Bee Advisory Box" to neonicotinoid insecticide products (imidacloprid, dinotefuran, thiamethoxam, and clothianidin) to protect bees and other insect pollinators. The bee icon above signals that the pesticide has potential to harm bees. The language in the new bee advisory box explains application restrictions to protect bees. Also, bee cautions can be found in the "Directions for Use" section of the insecticide label. You can find the document at the url: <http://www2.epa.gov/sites/production/files/2013-11/documents/bee-label-info-graphic.pdf>

**The bee advisory box states "Protection of pollinators"** "Application restrictions exist for this product because of risk to bees and other insect pollinators. Follow application restrictions found in Directions for Use to protect pollinators. Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators. This product can kill bees and other insect pollinators. Bees and other insect pollinators

will forage on plants when they flower, shed pollen, or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

1. Direct contact during foliar application or contact with residues on plant surfaces after foliar application.
2. Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar application.

When using this product take steps to:

1. Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
2. Minimize drift of this product onto beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives can result in bee kills.

Also, there is new language in the “Directions for use” section of the label, that states: “ Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless one of the following conditions....”

Information on protecting bees and other pollinators can be found at the Pesticide Environmental Stewardship website at: <http://pesticidestewardship.org/pollinatorprotection/Pages/default.aspx>

### **Minnesota’s new plant labeling law is in effect to protect pollinators**

As of July 1 2014 a new plant labeling law is now in effect in Minnesota to protect pollinators from exposure to toxic levels of insecticides. The new law requires that plants advertised as “beneficial to pollinators” must be free of detectable levels of certain systemic insecticides.

The Minnesota Department of Agriculture (MDA) Plant Protection Division (PPD) will enforce the law.

The law is meant to protect plant pollinators from exposure to detectable levels of insecticide residues that may persist in flowering plants sold in Minnesota nurseries.

The new law does not allow labeling or advertising of plants as “beneficial to pollinators” if the plants have been treated with certain systemic insecticides. Systemic insecticides are compounds that move within the tissues of a plant which means they can potentially reach the plant flowers where pollinators may be feeding or collecting pollen.

The MDA has developed a fact sheet about the new law that is posted on the agency’s website at [www.mda.state.mn.us/labelfactsheet](http://www.mda.state.mn.us/labelfactsheet) and <http://www.mda.state.mn.us/en/news/releases/2014/nr20140715-bees.aspx>

In addition, Minnesota business owners and residents with questions about the new law can send an email to [mda.nursery@state.mn.us](mailto:mda.nursery@state.mn.us) for information about the law, compliance, and labeling options. CONTACT: Margaret Hart, MDA Commun., 651-201-6131, [margaret.hart@state.mn.us](mailto:margaret.hart@state.mn.us)

### **18H.14 MN labeling and advertising of nursery stock**

**Nursery stock advertised as being beneficial to pollinators must now meet specific requirements according to a new law in Minnesota statute 18H.**

(e) A person may not label or advertise an annual plant, bedding plant, or other plant, plant material, or nursery stock as beneficial to pollinators if the annual plant, bedding plant, plant material, or nursery stock has been treated with and has a detectable level of systemic insecticide that: (1) has a pollinator protection box on the label; or (2) has a pollinator, bee, or honey bee precautionary statement in the environmental hazards section of the insecticide product label. The commissioner shall enforce this paragraph as provided in chapter 18J.

- Advertising is defined as an effort to bring public attention to promote something. Calling attention to an attribute or a characteristic of a plant would therefore be considered advertising. Any claims about attracting

butterflies or other pollinators are considered advertising. Therefore nurseries should avoid using terms or symbols to indicate that a particular species or variety is attractive or beneficial for pollinators if they have been treated with a systemic insecticide as defined in the statute. Company catalogs that include characteristics of the plant species offered for sale are subject to the provisions of this law.

- All insecticides that act systemically and that have a “bee box” or a pollinator, bee or honey bee precautionary statement in the environmental hazards section of the product label are affected by the law. The MDA will coordinate the development of a list of nursery/landscape insecticides potentially affected by the law.
- A nursery that advertises plants as beneficial to pollinators (including, for example, the terms “attracts” or “is attractive to” pollinators) will be expected to provide documentation on all insecticides used in the production of those plants. In addition, the MDA may initiate sampling of the plant to determine if there are detectable levels of systemic insecticides.
- The MDA intends to enforce this new statute using a phased approach. The initial focus of the MDA will be to inform and educate the nursery industry about the requirements of this new law. We will also begin conducting initial inspections with a focus on non-regulatory compliance assistance, and the possible collection of random samples of plants advertised as pollinator beneficial for the presence of systemic insecticides.

Send questions to: [MDA.Nursery@state.mn.us](mailto:MDA.Nursery@state.mn.us)

Note that the legislation does not disallow the use of insecticides that act systemically (whether whole-plant via plant vascular systems, or locally via translaminar uptake); rather, plants cannot be advertised as beneficial to pollinators only if they are treated with and have a detectable level of a systemic insecticide that:

1. has a pollinator protection box on the; or 2. has a pollinator, bee, or honey bee precautionary

statement in the environmental hazards section of the product label.

Therefore, it is how the plant material is labelled, in conjunction with the residue level of certain systemic insecticides in plant tissue, that establish whether nurseries are in compliance with the law, irrespective of the actual insecticide used.

In other words, the law does not mandate nor direct the development of a specific list of insecticides that may or may not be used. It simply says that if a nursery stock and other defined plants are advertised as beneficial to pollinators then those plants must not have detectable levels of systemic insecticides.

Enforcement of this statute by MDA PPD will therefore focus on verifying that nursery stock and other designated plants that are advertised as being “pollinator friendly” do not have detectable levels of systemic insecticide.

The following list of potential systemic insecticides affected by the law, the use of which (depending on their product labels) may render the labelling of plants as non-compliant with the law if residues are detected in the plant material, include:

On the list, but not registered for use on nursery, greenhouse, and landscape by the EPA (24 insecticides) are: **aldicarb, bendiocarb, demeton-s-methyl, ethoprop, dichlorvos, dicotophos (cotton only), fensulfothion (field crops), fenthion (mosquitoes in Florida), fipronil, methamidophos, methomyl, methyl bromide, mevinphos, oxydemeton-methyl phosphamidon, sulfoxaflor, terbufos, tralomethrin (roach), carbofuran (U.S. cancelled), dimethoate (U.S. cancelled), disulfoton (U.S. cancelled), mexacarbate (U.S. cancelled), phorate (U.S. cancelled), ronnel (U.S. cancelled).**

Here is the list of systemic insecticides affected by the law and not approved on bee-friendly-labeled plants. These insecticides are registered for use on nursery, greenhouse, and landscape by the EPA (18 insecticides): **abamectin, acephate, acetamiprid, avermectin, bifentazate, carbaryl, chlorfenapyr, clothianidin, cyantraniliprole, dinotefuran, emamectin benzoate, imidacloprid, milbemectin, oxamyl, pymetrozine, spinosad, thiacloprid, thiamethoxam.** Of these 18 insecticides, four are

systemic neonicotinoid insecticides and of the remaining 14 only 7 (abamectin, acephate, bifentazate, carbaryl, chlorfenapyr, pymetrozine, spinosad) are commonly used in greenhouse and nursery production.

1. New!! MDA Agricultural Landscapes

[http://www.mda.state.mn.us/protecting/bmps/~media/Files/protecting/bmps/pollinators/pollinator\\_sagland.pdf](http://www.mda.state.mn.us/protecting/bmps/~media/Files/protecting/bmps/pollinators/pollinator_sagland.pdf)

2. New!! MDA Yards and Gardens

[http://www.mda.state.mn.us/protecting/bmps/~media/Files/protecting/bmps/pollinators/pollinator\\_yardbmps.pdf](http://www.mda.state.mn.us/protecting/bmps/~media/Files/protecting/bmps/pollinators/pollinator_yardbmps.pdf)

**Which flowers do not attract bees?**

There are not any plant lists that identify plants not attractive to bees. Bees do not use double flowers, as male parts are bred to make additional petals, and the flower does not produce pollen and nectar. Most double flowers that show no pollen will not be fed on by bees. However, older varieties of zinnia, marigold, and dahlia, especially those that have visible yellow pollen, will be fed on by bees. Most annual bedding plants do not contain pollen and nectar and consequently are not attractive to bees. Bees will probe and visit flowers of plants that do not provide food. A feeding bee has a pulsating abdomen.

Many annual bedding plants, such as recent Tea roses with closed buds, Begonia, Impatiens, New Guinea Impatiens, Geranium, Callibachoa, petunia, pansy, Fuchsia, Gerbera, Coleus, marigold, Dusty Miller, and many other seasonal table top plants, such as chrysanthemum, Poinsettia, and Cyclamen are not attractive to bees. **You could use systemic insecticides on these plants, as** long as they are not advertised as bee-friendly.

**Which flowers attract bees?**

Avoid treating flowering plants that bees utilize with systemic, neonicotinoids. Bees prefer to feed on native plants and heirloom “garden” varieties of plants.

Some perennials very attractive to bees are: *Potentilla*, pussy willows, all flowering crabapple, apple, pear, hawthorn, and serviceberry, *Delphinium*, *Campanula*, *Liatris* blazing star, *Echinacea* cone flower, *Sedum*, *Penstemon*, *Digitalis* foxglove, honeysuckle, *Salvia nemorsa* Maynight,

*Salvia verticillata* Purple Rain, *Nepeta* catnip and catmint, *Sedum*, *Angelica gigas* Korean Angelica, *Solidago* goldenrod, New England aster, *Verbascum*, *Scabious*, *Viburnum*, and *Rosa rugosa* hybrids common milkweed, swamp milkweed, *Verbena bonariensis*, *Echinops* globe thistle.

Some annual bedding plants very attractive to bees are fennel, basal, dill, rosemary, thyme, lavender, heather, *Salvia*, *Tithonia* Mexican sunflower, *Asclepias* Mexican milkweed, *Buddleia*, *Gaillardia*, *Ganzania*, *Verbena*, *Portulaca*, *Lantana*, *Lobelia*, *Ageratum*, *Alyssum*, and snapdragons

There are numerous lists identifying plants attractive to bees. Some lists only contain native plants, while other lists contain heirloom “garden” varieties of plants:

1. The University of MN bee lab bulletin, Plants for Minnesota bees

[http://www.beelab.umn.edu/prod/groups/cfans/@pub/@cfans/@bees/documents/article/cfans\\_article\\_451478.pdf](http://www.beelab.umn.edu/prod/groups/cfans/@pub/@cfans/@bees/documents/article/cfans_article_451478.pdf)

2. Pollinator plants Midwest region

[http://www.xerces.org/wp-content/uploads/2014/09/MidwestPlantList\\_web.pdf](http://www.xerces.org/wp-content/uploads/2014/09/MidwestPlantList_web.pdf)

3. CUES: Pollinator Conservation, plants for bees and other pollinators

[www.entomology.umn.edu/cues/pollinators/plants.html](http://www.entomology.umn.edu/cues/pollinators/plants.html)

4. CUES: Poster, Save the bees plant flowers and trees

[http://www.entomology.umn.edu/cues/pollinators/plant\\_sposter.pdf](http://www.entomology.umn.edu/cues/pollinators/plant_sposter.pdf)

5. CUES: Bulletin, Plants for butterfly gardening

[www.extension.umn.edu/garden/yard-garden/landscaping/butterfly-gardening/](http://www.extension.umn.edu/garden/yard-garden/landscaping/butterfly-gardening/)

6. CUES: bulletin, Plants that provide pollen and nectar for beneficial insects

[www.entomology.umn.edu/cues/gervais/keytable.htm](http://www.entomology.umn.edu/cues/gervais/keytable.htm)



Information on insecticide toxicity to bees. In gray are insecticides not permitted by the MDA on bee-friendly-labeled plants. Systemic neonicotinoid insecticides (imidacloprid, clothianidin, dinotefuran, and thiamethoxam) are translocated to pollen and nectar of flowers for some time after application. Contact insecticides should not be translocated to pollen and nectar and should not be present in new flowers. Many contact insecticides are toxic to bees and should not be sprayed directly on foraging bees or flowers. In structures use contact insecticides during cultivation; when plants are sold, they will not contain residues of systemic insecticides in flowers. Modified from "Protecting honeybees from pesticides", Purdue Extension, E-53W, Krupke, C., G. Hunt, and R. Foster, June 2014 and "How to reduce bee poisoning from pesticides", A Pacific Northwest Extension Publication, OSU, UI, WSU, PNW 591, Hooven, L., Sagili, and E. Johansen. *The information given herein is supplied with the understanding that no discrimination is intended and no endorsement by the University of Minnesota Extension. Remember, the label is the law.*

Chemical class	Examples of common names	Bee Toxicity			
		Non	Low	Mod	High
Carbamates	carbaryl, methomyl				All x
Neonicotinoids	imidacloprid (I) thiamethoxam (T) clothianidin (C) dinotefuran (D) imid+bifenthrin (I,B)				All x
	Less toxic: acetamiprid (A) thiacloprid (T)		All x		
Organophosphates	acephate, chlorpyrifos, dimethoate, malathion, phosmet				All x
Pyrethroids	bifenthrin, cyfluthrin, fenpropathrin, lambda-cyhalothrin, permethrin				All x
Botanical	pyrethrum/pyrethrins azadirachtin			x	x
Insect growth regulators	diflubenzuron tebufenozide	All x			
	azadirachtin buprofezin pyriproxyfen	x x		x	
	novaluron			x	
	cyromazine			x	
Juvenile hormone	s-kinoprene		x		
Diamides	chlorantraniliprole cyantraniliprole	x			
Macrocyclic lactones	abamectin/avermectin				x
Miticides	acequinocyl, extoxazole, fenpyroximate, fenbutatin-oxide	All x			
	clofentezine, hexythiazox	x,x			
	bifenazate		x		
	pyridaben				x
	chlorfenapyr spiromesiifen	x		x	
Spinosyns	spinosad, less toxic when dry		x		
Tetronic acids	spirotetramat			x	
GABA-channel	fipronil				x
Pyridine carboxamide	flonicamid	x			
Pyridine azomethines	pymetrozine		x		
Avermectin	emamectin benzoate				x
Other insecticides	<i>Bacillus thuringiensis</i> ,	x			
	potassium salts fatty acids soaps	x			
	horticultural mineral oils, neem oil	x			

Vera Krischik is a tenured Faculty in the Entomology Department of the College of Food, Agricultural and Natural Resource Sciences at the University of Minnesota. One of the goals of the College is to develop viable food and agricultural systems, while maintaining healthy natural resources.

Vera obtained her PhD from the University of Maryland in 1984, held a Post Doc at the University of Maryland, was a researcher at the New York Botanical Garden (NSF sponsored Visiting Professor for Women, 1991-1993), and was an IPM coordinator at USDA, Washington DC from 1988-1994. Since 1995, she is a professor in the Department of Entomology at the St. Paul, University of Minnesota. She teaches 2 courses: ENT 5009, Pesticide Use and Misuse and ENT 4015, Ornamental and Turf IPM. She was author on three books: one published in 1991, the first USDA grain insect management manual, still being published today, a second book in 1991 by John Wiley entitled "Microbial Mediation of Plant Insect Interactions" and another published in 2004 by the MN Agricultural Experiment Station on "IPM of Midwest Landscapes", 316 pp. She has partnered with MDA, DNR, MNLA, MNTGF, and watershed districts for her outreach and research programs and publications. She has developed a plant restoration bulletin and poster in cooperation with the DNR and Ramsey Watershed District. She teaches at least 5 large workshops each year on proper pesticides use in cooperation with MDA and MNLA. She has trained 8 graduate students and 1 post doc. She is director of CUES: Center for sustainable urban ecosystems that promote natural resource management, online at [www.entomology.umn.edu/cues](http://www.entomology.umn.edu/cues). In 2010 and 2014 Krischik received an LCCMR grant" on Mitigating Pollinator decline". An outreach a poster on the right plants for bees, a protecting bee bulletin, pesticide and bee bulletin, and an online workshop are available at the CUES Website under "Pollinator Conservations" at [www.entomology.umn.edu/cues](http://www.entomology.umn.edu/cues)