Agricultural Innovation Board (AIB)
Agency of Agriculture, Food, and Markets
State of Vermont
116 State Street
Montpelier, Vt 05620-2901

October 21, 2024

**Re: Best Management Practices for Neonicotinoid Treated Article Seeds and Other Uses of Neonicotinoid Pesticides**

Dear Members of the Agricultural Innovation Board,

We, the undersigned experts in agriculture, entomology, and environmental sciences, are writing to introduce the attached draft Best Management Practices (BMPs) for the use of neonicotinoid treated article seeds, as well as specific additional uses of neonicotinoid pesticides. These BMPs have been developed as a reference point to assist the Board in its deliberations as it advises the Secretary of Agriculture, Food, and Markets on the forthcoming rules required under Act 182.

The law requires the Secretary, after consultation with the AIB, to adopt BMPs for the use of neonicotinoid-treated article seeds before January 1, 2029, as well as under specific exemption orders that allow for their continued use after the prohibition is in effect. These BMPs also cover uses of neonicotinoids prohibited after July 1, 2025 under approved exemption orders, as well as non-prohibited agricultural uses of neonicotinoids. We believe our draft BMPs can help provide a framework that balances agricultural needs and feasibility with the protection of pollinators and other sensitive wildlife.

We recommend clear criteria to ensure neonicotinoid-treated seeds are only used when risk assessment tools and/or prior field history indicate high risk of pest pressure and damage, bringing the use of these seeds in line with the principles of integrated pest management.

To ensure that these BMPs are feasible for Vermont growers, we encourage the AIB and AAFM to explore options for reducing burdens on farmers, such as:

- Develop and distribute educational materials, such as online guides, brochures, or databases, where farmers can access information on non-neonicotinoid seed options as well as equipment modifications to reduce dust-off at planting. Ideally, these resources would also include a directory of local dealers or manufacturers where growers could find seed and equipment options.
- Provide resources on available incentives and cost-share programs for the use of non-neonicotinoid seeds, as well as the creation and maintenance of windbreaks, shelterbelts, and vegetative buffers to reduce and capture dust, runoff/erosion, and leaching from treated fields.

- Foster the establishment of collection programs that allow end-users to return excess pesticide-treated seeds and related materials (e.g., seed bags, equipment filters) to the manufacturer or treatment entity for responsible disposal. This system would not only support environmental stewardship but also help farmers comply with hazardous waste regulations more easily and cost-effectively.

We also encourage AIB and AAFM to support research to inform best practices and educational materials, including information on the prevalence and risk of seed and seedling damage in different areas of the state, the efficacy of cultural practices for reducing seed pest populations and stand damage, and grower surveys to understand current practices and future needs. In order for Vermont growers to make appropriate use of pest risk assessment tools currently under development at Cornell University, additional data may be needed on pest incidence, weather, soil, and management practices in order to test and validate these models under Vermont-specific field conditions.

The adoption of sound BMPs will be critical for protecting Vermont pollinators and aquatic life, while ensuring that our agriculture remains productive and sustainable. We believe these BMPs represent a balanced, science-based approach that will help Vermont's farming community meet both environmental and economic goals.

We look forward to working with the Agricultural Innovation Board and the Agency of Agriculture, Food, and Markets to refine these BMPs and ensure their effective implementation. Thank you for your consideration, and we welcome any opportunity to further discuss these recommendations.

Sincerely,

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# Best Management Practices for the Use of Neonicotinoid Treated Article Seeds

These best management practices apply to the use of neonicotinoid treated article seeds when used prior to January 1, 2029, and when the Secretary issues a written exemption order authorizing the use of neonicotinoid treated article seeds after January 1, 2029.

## Use Integrated Pest Management to Assess Pest Risk

Integrated Pest Management (IPM) relies on carefully monitoring pests and diseases and applying treatments only when pest pressure exceeds economic thresholds. The widespread prophylactic use of neonicotinoid-treated seeds without clear pest incidence or economic benefit contradicts the basic principles of IPM. In Vermont, prophylactic use has led to neonicotinoid treated seeds being the single largest contributor to insecticide use in the state. Resulting contamination of soil, water, and plants poses risks to pollinators, aquatic invertebrates, and other wildlife. Reducing prophylactic use by incorporating seed treatments into an IPM framework is crucial to minimizing these harmful impacts.

- Do not use seed treated with neonicotinoids unless there is a specific pest problem identified via scouting and monitoring, risk assessment tool predictions, or prior field history of pest pressure and/or pest damage that can only be effectively managed with a neonicotinoid seed treatment.
- Scout and monitor for seed pests (e.g., wireworm, seed corn maggot) before and during the growing season.
    - Wireworms can be monitored with bait traps[1] or soil samples taken by shovel from different locations around the field.[2] Scouting records from the previous season that demonstrate pest pressure above economic thresholds (e.g., >1 wireworm per bait station at a rate of 1 bait station per 3-5 acres, 2+ wireworms per 10 shovels of soil) can be used to inform the use of treated seeds in the following season.
- Keep detailed records of crop yield, pest pressure, and damage. These records should include planting dates, varieties, and environmental conditions.
- Consult available risk assessment and prediction tools to determine field-scale risk of soil pests, as appropriate.
    - Cornell is developing a risk assessment and prediction tool for seed pests. Once available and trialed/validated with Vermont field conditions, this tool may be able to be used to identify fields with a high risk of soil pest pressure or damage to determine whether use of treated seeds is justified.
- Use preventive measures to minimize emergence and potential damage from seed pests. Preventive measures include:
    - Waiting to plant until soil temperatures are >50F. Warmer soils allow for faster seed germination, reducing potential injury from seed pests.

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[1] Darby, H., & Augarten, A. (2024). Wireworm and Neonicotinoid Treated Seed in Row Crops. University of Vermont Extension. https://www.uvm.edu/sites/default/files/Northwest-Crops-and-Soils-Program/Articles_and_Factsheets/Neonicotinoid_and_Wireworm_Final.pdf

[2] Gesell, S. &. D. C. (1983, updated 2023). Wireworms as Pests of Field Crops. Penn State Extension. https://extension.psu.edu/wireworms-as-pests-of-field-crops

  - Cover cropping with non-legumes, such as buckwheat or brown mustard.
  - Rotating crops.
  - Managing weeds in fields, especially grasses.
  - Avoiding spring applications of manure.
  - No-till planting. Research in PA found about 15 times more seedcorn maggot flies emerged from corn fields where cover crops were managed with tillage, compared to fields where cover crops were terminated with a roller-crimper followed by no-till planting (Regan et al. 2024).
  - Waiting 2-3 weeks to plant if using tillage to incorporate a living cover.

### Reduce Dust Off at Planting and Minimize Risks to Pollinators

Neonicotinoid-contaminated dust generated during the planting of treated seeds can drift off-site and cause acute harm to pollinators exposed to the dust cloud, as well as longer-term harm to wildlife when the dust is deposited on soil, water, and plants around fields. Minimizing dust drift is a critical element of best management practices for treated seeds.

- Avoid planting on windy days (>10 mph).
- Use no till planting and other reduced tillage practices to help avoid generating field dust. Plant residue on the soil surface can reduce the amount of particulate matter (PM) generated at planting and moved off-site with the wind. Conservation tillage can reduce PM emissions from dairy forage by 50-80% (Madden et al. 2008).
- If conditions are very dry, consider whether planting could wait for additional rainfall. Excessively dry soil conditions can increase dust generation during planting resulting from a drier soil surface and from increased pressure settings on planters. Adequate soil moisture at seeding depth in the first 48 hours post-planting also helps to ensure rapid and even seed germination; both too much or too little soil moisture at depth can result in uneven emergence and yield loss.
- Maintain planter speed below 6 mph. Dust emissions from vehicles are approximately linearly related to vehicle speed, as higher speeds cause greater soil disturbance. At higher planting speeds, greater downforce is also required to maintain correct seeding depth.
- On vacuum or positive air pressure planters, direct air exhaust downward towards the soil surface. This may require equipment modification such as tubes that divide the air stream generated by the fan and release it close to the ground. Consult with your equipment manufacturer or dealer to determine appropriate air deflectors (e.g., "bee kits") or other physical devices, such as filters, diffusers, cushions, or other modifications that reduce dust drift by filtration or reduction of air velocity for your equipment. Deflectors that reduce air speed and direct air close to the soil or into furrows can reduce airborne dust (Nuyttens and Verboven, 2015). Some air deflector kits can reduce the concentration of neonicotinoids in the air by 70-90%.
- Use the proper rate for any seed lubricant, including talc, graphite, or alternative fluency agents. Adding high rates of seed lubricants can increase dust drift.
  - Some research suggests that less abrasive synthetic seed lubricants can reduce net emissions of neonicotinoids from planting of treated seeds relative to talc or graphite

powder; however, mixed evidence leads us to refrain from specific recommendations on alternative fluency agents.

- Plant treated seed at a depth greater than 1 inch (2.5 cm). If the seed is broadcast on the soil surface, incorporate it immediately.
- Do not raise the seeder at the end of a row without switching off the seed supply.
- Immediately cover small quantities of treated seed that are spilled during loading and in areas such as row ends, and plant seed away from bodies of water. Collect larger quantities of spilled seed. Treated seed left on the surface can be harmful to wildlife.

### Improve Communication with Beekeepers and Neighbors to Minimize Risks

Advance communication between crop producers and beekeepers about the timing and location of treated seed planting can help to reduce the likelihood of planting-related bee mortality incidents.

- Before planting, notify beekeepers within 2 miles of fields that will be planted with treated seeds with at least 24 hours advance notice. Once available, beekeepers and growers can use the DriftWatch tool to register hive locations and identify relevant parties to communicate with ahead of planting.
- Post clear, visible, and legible warning signs at entrances to the crop field 48 hours or less before planting of neonicotinoid treated article seeds. Signs must remain posted for at least 3 days.

### Reduce Off-Site Movement with Mitigation Measures for Dust, Runoff, Erosion, and Leaching

A variety of mitigation measures can be implemented to help reduce off-field movement of neonicotinoids. Many of these measures are described in more detail in USDA's Agronomy Technical Note No. 9: *Preventing or Mitigating Negative Impacts of Pesticides on Pollinators*.

- Properly designed windbreaks can help capture drift, including dust emissions generated at planting. Plant windbreaks or shelterbelts between fields planted with neonicotinoid treated article seeds and perennial pollinator habitat or apiaries, particularly if those areas are typically located downwind of planting operations. Windbreaks planted with the purpose of drift and dust reduction should consist of trees and shrubs that are **not attractive to pollinators**, such as rows of dense conifers.
- Plant filter or buffer strips on the downslope edges of fields planted with treated seeds, and between treated fields and aquatic habitats. Mitigations designed to capture pesticides via runoff, erosion, or dust at the field edge should consist primarily of plants that are not attractive to pollinators, such as grasses and non-flowering trees and shrubs.
- Neonicotinoids can be transported to surface water and groundwater from fields with tile drainage (Schaafsma et al. 2019). Consider practices that limit their movement into drainage systems, such as saturated buffers or bioreactors.

### Loading and Cleaning Equipment

Loading of treated seed poses occupational safety risks to handlers. Properly cleaning and maintaining planter equipment reduces the risk of residual pesticide dust being released into the environment during future planting operations.

- Wear the proper personal protective equipment (PPE) when handling treated seeds. Always read the label on the bag. Most seed labels require at minimum a long-sleeve shirt, long pants, shoes, and chemical-resistant gloves (>14-mil thickness) be worn when handling treated seed; coveralls, a dust mask or respirator, and safety glasses or goggles are also recommended for loading and cleaning planting equipment.
- Handle seed bags with care to reduce abrasion and dust generation.
- When loading seeds, do not pour excess residue out of the seed bag into the seeder.
- After handling seed, wash gloves before removing them. After removing gloves, wash hands with soap and water. Wash, store, and/or dispose of PPE to avoid tracking dust out of treated areas and exposing others. Do not wash contaminated clothing with non-work clothing.
- Clean equipment away from pollinator habitat, honey bee hives, and other sensitive areas.
- Never pour rinse water in any location where there is a surface water contamination risk. Care should be taken to avoid runoff and leaching into water bodies, storm drains, wells, and septic systems.
- Rinse water from seed treatment or planting equipment may be applied to a crop or site for which the active ingredient is registered, but only if it will not result in an applied concentration above the labeled rate. Excess rinse water can also be stored in a sealed container and disposed of as hazardous waste.

### Treated Seed Disposal

Disposal of neonicotinoid-treated seeds can pose environmental risks and lead to contamination of soil, water, and wildlife habitats. Current label instructions for treated seed disposal inadequately protect wildlife by allowing practices like on-site burial, which can expose wildlife to neonicotinoids through accidental ingestion, particularly species such as birds and small mammals that may mistake buried seeds for food. Ensuring that excess seeds and associated byproducts are handled properly is important for protection of non-target wildlife.

- Keep records of the amount of excess treated seed produced by crop each year, as well as methods used for disposal.
- Treated seeds **must be kept covered** to prevent wildlife from ingesting seed, including at waste facilities and from accidental spills.
- Unless restricted by label statements, excess treated seed may be double planted within a portion of the field, or planted at a normal seeding rate in a non-cropped area of the farm. If there is an option for storage and future planting, return the excess seed to its original container. Do not spread and incorporate seed at higher than normal seeding rates.
- Burial of excess seeds introduces unnecessary risks into the environment and should be avoided.
- Do not burn or compost pesticide-treated seed or seed bags for any purpose.
- Excess neonicotinoid treated article seeds should not be used for ethanol, biodiesel, or other fermentation or oil processing.
- If the quantity of excess seed is larger than can be planted, or is not viable for planting, the seeds should be disposed of in a lined landfill with leachate collection and treatment, by high-temperature incineration in a waste management facility, or via other regional hazardous waste disposal streams.

- Dispose of any contaminated byproducts (e.g., seed bags, equipment filters, and other contaminated materials generated from the treatment, storage, disposal, or use of treated seeds) following the instructions on the seed bag, or through a hazardous waste collection process. Some companies may have return options for these materials. Used bags may also be incinerated either in a permitted hazardous waste incinerator or municipal solid waste incinerator with appropriate air emissions control equipment.

# Best Management Practices for Agricultural Use of Neonicotinoids (non-prohibited uses)

These best management practices apply to the agricultural use of neonicotinoid pesticides after July 1, 2025, the use of which is not otherwise prohibited under law.

## Use Integrated Pest Management to Inform Decisions

Integrated Pest Management (IPM) relies on carefully monitoring pests and diseases and applying treatments only when pest pressure exceeds economic thresholds. By using scouting, monitoring, and economic thresholds, farmers can ensure that neonicotinoid applications are made only when and where justified, reducing the risk to pollinators and beneficial insects.

- Scout fields regularly to identify and monitor pest populations and any associated damage. Ensure insects are accurately identified and management is targeted to the biology of the specific pest.
- Keep records documenting scouting and monitoring. Detailed records support long-term pest management planning and provide data to justify pesticide applications.
- Use non-chemical preventive measures such as cultural, physical, and biological controls, and select insect resistant/tolerant crop varieties to avoid or reduce pest risk. These practices can help reduce the need for chemical interventions.
- Use predetermined thresholds to help determine if, when, and where to apply based on scouting and monitoring of pest activity, pressure, and damage. These shall be determined as economic thresholds for agricultural uses, with other predetermined thresholds for non-agricultural uses, such as grub treatments in turfgrass.
- Refer to the New England Tree Fruit and Vegetable Management Guides for economic thresholds in agricultural crops. Consult with a local Extension agent or independent crop consultant for more information.
    - *New England Vegetable Management Guide* https://nevegetable.org/
    - *New England Tree Fruit Management Guide* https://netreefruit.org/

## Always Read and Follow the Label

The label is the law. Labels must be read and followed for all requirements. Some label directions are mandatory ("must" and "do not") and some are advisory ("should," "may," and "recommend").

- Ensure that you and any additional pesticide handlers, including any who do not read or speak English, understand the label directions. The National Pesticide Information Center (NPIC) can be reached with questions about pesticide products, including label directions, at 1-800-858-7378 (8:00am - 12:00pm PST), or npic@ace.orst.edu.

### Reduce/Optimize Use in Agricultural Fields

While certain crops may continue to rely on neonicotinoid applications, there are still opportunities to reduce their use and associated impacts to pollinators and other wildlife. Limiting treatment areas, using the lowest effective label rate, and leveraging precision agriculture technologies that allow for more targeted use can help reduce inputs and non-target impacts.

- If a chemical application is justified based on scouting and economic thresholds, consider less toxic and less persistent alternatives before choosing to use a neonicotinoid. Use resources to assess pesticide toxicity to pollinators, such as:
  - Cornell Pollinator Protection Guides (https://cals.cornell.edu/pollinator-network/conservation/pollinator-protection-guides).
  - UC IPM Bee Precaution Pesticide Ratings tool (https://ipm.ucanr.edu/bee-precaution-pesticide-ratings/)
  - PNW Extension, *How to Reduce Bee Poisoning from Pesticides* (https://extension.oregonstate.edu/catalog/pub/pnw-591-how-reduce-bee-poisoning-pesticides)
- Only treat the areas that exceed the predetermined economic thresholds based on monitoring of pest levels. Use spot sprays, perimeter trap crop treatments, and other targeted methods when pest thresholds are only exceeded in part of a field or block.
- Use the lowest labeled application rate that will effectively control the pest. Recommended label rates will vary with the target pest species.
- Where possible, apply with electrostatic, image-responsive, or other precision agriculture and sensor-based technology designed to reduce pesticide input and target applications only where needed (for example, image-responsive sprayers that turn on/off when they detect foliage).
- Rotate neonicotinoids with other classes of insecticides to avoid resistance development in pest populations. Avoid sequential applications of neonicotinoids following seed, soil, trunk injection, or foliar applications of a neonicotinoid.

### Reduce Drift and Off-Site Movement From Foliar Applications

Drift of neonicotinoids poses significant risks to pollinators and other non-target wildlife. When neonicotinoid particles move off-site during application, they can settle on nearby flowering plants, soil, and water bodies, leading to unintended exposure. Since neonicotinoids are systemic, they are absorbed by plants and can be present in nectar and pollen, which bees and other flower-visiting beneficial insects rely on for food. Even small amounts of drift can contaminate foraging areas, exposing beneficial insects to harmful residues long after the application. Reducing drift is critical to protecting pollinator health and minimizing environmental contamination.

- Do not apply aerially. Aerial applications significantly increase the risk of off-site drift.
- Monitor weather conditions and apply during favorable conditions, which include:
  - Wind speeds 3 to 9 mph.
  - Temperatures <85F. High temperatures and low relative humidity can increase evaporation of spray droplets and reduce droplet size, increasing drift potential.

    - Wind direction is away from non-target areas of concern (e.g., hives and flowering pollinator habitat). Monitor carefully, as wind direction may change over the course of an application.
- Avoid applying in these conditions:
    - Temperature inversions (e.g., dead calm conditions, where aerosols can remain suspended and move unpredictably; these inversions typically occur in the early morning or evening).
    - During rain or when soil is saturated, which favors runoff. Avoid foliar applications if rain is predicted in the next 48 hours.
- Use the coarsest effective droplet size recommended by label directions. Select nozzles that produce medium or coarser droplet sizes to minimize drift (e.g., 200-400 microns, ASABE S572.l). Larger droplet sizes decrease spray drift potential.
- Consider using precision application technology (e.g., auto-steer, auto-boom shutoff and variable rate sprayer) to avoid overspray, spray overlap, and higher than recommended application rates.
- Where possible, use hooded or shielded sprayers to contain the spray and reduce drift.
- Consider using drift reduction agents that increase droplet size and reduce the likelihood of drift. Always check for compatibility with the pesticide being applied and follow label or manufacturer guidelines.
- Regularly maintain and calibrate spray equipment to ensure the correct rate of pesticide delivery. Check for worn nozzles, cracked spray lines, and other equipment issues that can lead to inconsistent spraying or smaller droplet sizes, which are more prone to drift.

### Minimize Risk to Pollinators from Foliar Applications

Pollinators can be exposed to neonicotinoids directly, as well as through contaminated nectar, pollen, soil, and puddles. In addition to direct exposure, certain tank mixes can increase the toxicity of neonicotinoids to bees through synergistic interactions. To reduce these risks, it is critical to prevent applications from reaching flowering plants, avoid known synergists, and carefully time applications to when pollinators are least active.

- Do not apply to or allow applications to drift onto flowering plants, including weeds in turf or row middles. Mow weeds or terminate flowering cover crops in a field, vineyard, or orchard to remove flowers attractive to pollinators before application.
- Avoid tank mixes with other insecticides and fungicides, and do not apply neonicotinoids within three days of applications of known synergists (e.g., DMI fungicides, piperonyl butoxide). During pesticide registration and review, the US EPA typically evaluates chemicals individually, without accounting for or testing the combined effects of tank mixes. When bees are exposed to neonicotinoids along with other pesticides, it can unintentionally amplify the toxicity of the mixture to pollinators.
- Time applications when pollinators are least active (e.g., immediately after dark).
    - Where possible, avoid applying when dew formation is expected overnight. Dewy nights may cause re-wetting of insecticides on foliage and lengthen their residual toxicity.
- Notify beekeepers within 1 mile with at least 48 hours advance notice before a full field foliar neonicotinoid application. Once available, beekeepers and growers or hired commercial

applicators can use the DriftWatch tool to register hive locations and identify relevant parties to communicate with ahead of applications. For smaller scale treatments, a discussion with adjacent beekeepers is recommended if the activity is occurring within 100 meters of the apiary. Prior notification is required for any established apiaries located on the premises.

### Reduce Risk from Trunk Injections and Soil Applications

Trunk injections and soil applications of neonicotinoids can result in long-term residue buildup in trees and soil. Research has shown that some neonicotinoids applied by trunk injection or soil drench, where residues are protected from UV degradation, can persist in some tree species for a year or more, maintaining toxic levels in pollen and nectar for more than one growing season. The use and timing of trunk injection and soil applications should be carefully considered alongside alternative management options.

- Where possible, avoid application of neonicotinoids by trunk injection or soil application to pollinator-attractive species.
- Do not apply when trees and shrubs are in flower or shortly before flowering. Given the persistence of neonicotinoids in woody tissues, it may be advisable to apply soil drenches or trunk injections at least 6 to 11 months before the expected flowering period. This includes the flowering period for species that produce only pollen, as wind pollinated trees are also visited by pollinators.

### Reduce Off-Site Movement with Buffers and Filter Strips

Establishing vegetative barriers, filter strips, and buffer zones can reduce the movement of neonicotinoids off-site, protecting water sources and nearby habitats. Buffers around pollinator foraging sites and drinking water sources are required under the Vermont Rule for Control of Pesticides (CVR 20-031-012).

- Establish no-spray buffers around sensitive areas such as pollinator habitats and water bodies, and/or plant a dense vegetative barrier designed to capture and reduce spray drift before it reaches sensitive areas.[3]
  - Do not apply within 50 feet of pollinator foraging sites, such as natural and semi-natural areas or intentional pollinator plantings, or:
  - Establish a 20-foot-wide non-pollinator-attractive vegetative barrier higher than the spray release height with an established 60% plant density. Windbreaks planted for the purpose of drift reduction should consist of trees and shrubs that are not attractive to pollinators, such as rows of dense conifers.
- Maintain the following buffers when applying to soil or vegetation around potable water sources, unless the label prescribes a greater buffer:[4]

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[3] Vermont Rule for Control of Pesticides, Chapter 012. Vermont Agency of Agriculture, Food and Markets, Public Health and Agricultural Resource Management Division. Effective February 2023. https://agriculture.vermont.gov/sites/agriculture/files/Vermont%20Rule%20for%20Control%20of%20Pesticides%20in%20Accordance%20with%206%20V.S.A.%20Chapter%2087%20(3.8.23).pdf

[4] Table 11-1 of the Wastewater System and Potable Water Supply Rules, Vermont Agency of Natural Resources, Drinking Water and Groundwater Protection Division. Effective April 2019.

    - (1) 100-foot buffer for all potable water sources in bedrock or confined aquifers;
    - (2) 200-foot buffer for all potable water sources in unconfined aquifers;
    - (3) 50-foot buffer for water service lines and pipes (pressure);
    - (4) 100-foot buffer for all water service lines and pipes (suction);
    - (5) 50-foot buffer for all water storage tanks (atmospheric below ground surface).
- Maintain a minimum buffer distance around any public water source when applying to soil or vegetation, unless the label prescribes a greater buffer:
    - (1) 100-foot buffer for all public non-community groundwater drinking water sources; and
    - (2) 200-foot buffer for all public community drinking water sources and intakes, and surface water public non-community drinking water intakes.
- Construct and maintain filter strips or other vegetative buffers (minimum of 10 feet wide) along waterways at the application site to capture pesticide runoff and reduce contamination of aquatic environments. Mitigations designed to capture pesticides via runoff, erosion, and leaching at the field edge should consist primarily of plants that are not attractive to pollinators, such as grasses and non-flowering trees and shrubs.
- Maintain grass or vegetation buffers near tile outlets, in drainage ways, and along field boundaries.

### Provide Safe Habitat for Pollinators Away from Treatment Areas

Establishing and maintaining pollinator-friendly habitat that provides nectar, pollen, and shelter away from areas where neonicotinoids are applied can help support healthy pollinator populations.

- Where possible, create pollinator habitat in non-crop areas sheltered from pesticide drift. Suitable areas for pollinator plants could include marginal or fallow areas outside of crop fields, especially upslope and upwind of treatment areas, areas around farmhouses or outbuildings, and along roadsides or treelines. Habitat areas can also be prioritized in areas sheltered from drift by windbreaks or shelterbelts.
- Pollinator habitat areas should provide continuous flowering resources with species that bloom at different times throughout the growing season, attracting and supporting pollinators when nearby crops are not in bloom. Diverse plantings of locally adapted native species will support many types of wild and managed pollinators.

### Personal Safety and Training

Neonicotinoids can pose risks to human health during occupational exposure, particularly through skin absorption and inhalation during mixing, loading, and application. To protect applicators and other farm workers, it is critical that all handlers are trained on safety protocols.

- Ensure that applicators wear appropriate PPE as specified on the product label (e.g., gloves, masks, protective eyewear, long-sleeved clothing), and that PPE is properly maintained, cleaned, and stored to prevent contamination and degradation.

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https://dec.vermont.gov/sites/dec/files/dwgwp/rorules/pdf/Wastewater-System-and-Potable-Water-Supply-Rules-April-12-2019.pdf

- Require all users be trained on the safe handling, application, and disposal of neonicotinoids, emphasizing the risks of inhalation or skin absorption during mixing, loading, and application.
- Post clear, visible, and legible warning signs at all entrances to treated areas 24 hours or less before the pesticide application. Use signs that comply with the Worker Protection Standard and clearly indicate the re-entry interval for treated areas.

### Loading, Cleaning, and Maintaining Equipment

Well-maintained and properly calibrated and cleaned equipment is important for reducing over-application, and preventing residues from building up in equipment and cross-contaminating future pesticide applications.

- Regularly calibrate application equipment. Incorrect calibration can lead to off-label application rates, increasing risk to non-target organisms and humans.
- Conduct routine maintenance checks on equipment and storage containers to prevent leaks or malfunctions.
- Use an anti-siphon device or an air gap when filling sprayers to prevent backflow into water sources.[5]
- Where possible, use closed mixing/loading systems to reduce the potential for worker exposure or spills.
- Ensure that equipment used for neonicotinoid applications is cleaned promptly and appropriately after use in a designated area located far from pollinator habitats and surface water (e.g., rivers, ponds, drainage ditches). Where possible, clean equipment at the site of application.
- Dispose of any waste materials, including filters, rags, or containers used during the cleaning process, in accordance with local hazardous waste disposal regulations.
- Never dump or discharge rinse water, cleaning solutions, or residues into storm drains, sewers, or any water source.

### Storage and Disposal

Improper storage or disposal of neonicotinoids can lead to contamination of water bodies and other sensitive areas. Safe handling of these chemicals requires strict adherence to disposal regulations and careful storage in secure, well-labeled facilities.

- Never dispose of neonicotinoids by pouring them down drains, toilets, storm drains, or any water systems. This can lead to contamination of water supplies, posing risks to aquatic life and human health.
- Do not pour leftover neonicotinoids in a single spot in a field.
- Keep records of all pesticide disposal activities, including dates, quantities, methods, and locations of disposal.
- Clean and dispose of pesticide containers according to label directions (e.g., triple rinse or pressure rinse).

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[5] Pesticide Safety Tips for the Workplace and Farm. Purdue Pesticide Programs, Purdue University Cooperative Extension Service. https://www.extension.purdue.edu/extmedia/ppp/ppp-61.pdf

- Store neonicotinoids in a locked, well-ventilated, and clearly labeled pesticide storage area that is not accessible to children, pets, or unauthorized personnel. Always keep pesticides in their original containers with labels intact.
- Provide training to all individuals handling or disposing of neonicotinoids in proper storage, handling, and disposal procedures.

## Best Management Practices for Use of Neonicotinoids (prohibited uses under written exemption order)

These best management practices apply to the use of neonicotinoid pesticides when the Secretary issues a written exemption order pursuant to section 1105c of this chapter authorizing the use of neonicotinoid pesticides, after July 1, 2025.

- Prohibited uses that could receive an exemption order and should be included in these BMPs include:
    - outdoor application of neonics to any crop during bloom
    - outdoor application of neonicotinoid pesticides to soybeans or any crop in the cereal grains crop group
    - outdoor application of neonicotinoid pesticides to crops in the leafy vegetables; brassica; bulb vegetables; herbs and spices; and stalk, stem, and leaf petiole vegetables crop groups harvested after bloom, and
    - application of neonicotinoid pesticides to ornamental plants.

**Applicators should follow the best management practices for non-prohibited agricultural uses in addition to the practices specified here for prohibited uses. Some uses prohibited under Act 182 are also prohibited by the federal product label (e.g., applications of certain neonicotinoids to crops in bloom). Always read and follow label directions.**

### Use Integrated Pest Management to Inform Decisions

IPM should form the basis of any decision to apply neonicotinoids, especially in cases where exemptions are being considered for otherwise prohibited uses. IPM focuses on long-term pest prevention using a combination of biological, cultural, mechanical, and chemical controls, only resorting to chemical treatments when necessary.

- Regularly scout to correctly identify and monitor pest populations. Use scouting results to inform decisions about interventions.
- Adopt multiple non-chemical methods including prevention, mechanical, and cultural methods to limit insect pests. These methods should always be used first before a chemical application is considered.
- Apply only when pest pressure reaches a predetermined threshold where control is necessary to prevent significant yield loss or where pest damage threatens the survival of ornamental plants, and other methods of control are not feasible or effective.
- Do not use neonicotinoids for cosmetic pest problems or routine maintenance.

### Outdoor Applications of Neonicotinoids to Crops During Bloom

Blooming crops attract pollinators, and neonicotinoids can contaminate nectar and pollen. Many of these uses are prohibited by the federal label because of the risk to pollinators. Always follow all relevant restrictions and label directions.

- Do not apply or allow to drift onto flowering weeds in or around treated areas. Mow or remove weeds in and around the treated field to reduce risks to pollinators during pesticide application.
- Notify beekeepers within 2 miles with at least 48 hours advance notice before a planned spray. Once available, beekeepers and growers or hired certified applicators can use the DriftWatch tool to register hive locations and identify relevant parties to communicate with ahead of applications.

### Outdoor Application of Neonicotinoid Pesticides to Soybeans or any other Cereal Grain

Pollinators will visit soybeans for nectar and pollen, and will occasionally visit other pollen-producing cereal grains. Pesticide drift from these fields can contaminate flowering resources in nearby areas.

- Target applications to specific areas of the field where pest thresholds are exceeded, rather than using blanket or broadcast spraying.
- Where possible, apply with hooded or shielded sprayers and use precision agriculture technology to minimize overapplication and drift. Always turn off nozzles before turning around at the edge of a field.
- For equipment-mounted sprayers, maintain speed at or below 7mph. Faster drive speeds increase air turbulence, field dust, and drift. Spray booms can also be maintained at lower heights when driving slowly.

### Outdoor Application to Leafy Vegetables, Brassica, Bulb Vegetables, Herbs and Spices, and Stalk, Stem, and Leaf Petiole Vegetables (Harvested After Bloom)

Neonicotinoid applications were prohibited for these crops due to the high risk of treatments that occur before bloom. Pollinators can be exposed to residues in nectar and pollen of crops treated before bloom.

- Avoid soil applications of neonicotinoids. Soil drenches and other systemic application methods can be more persistent than foliar uses.
- Do not apply within six weeks before bloom to minimize contamination of pollen and nectar.

### Application of Neonicotinoids to Ornamental Plants

Ornamental plants are defined as perennials, annuals, and ground cover planted for aesthetic reasons.[6] Neonicotinoid application to flowering ornamental plants, landscape trees and shrubs, and lawns maintained for aesthetic reasons pose risks to pollinators. If an exemption is granted, treatment should be limited to specific high-value plants that are not attractive to pollinators or where other pest control methods have failed.

- Do not use neonicotinoids for cosmetic pest problems or routine maintenance.
- Consider less toxic and persistent alternatives before resorting to a neonicotinoid.

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[6] Vermont Agency of Agriculture, Food, and Markets, *Vermont Pesticide Rules*, Chapter 11, § 2.15

- When a chemical application is justified and alternatives are not feasible, target application only to the affected plants. Spot treatments reduce unnecessary use and non-target impacts.
- Do not apply when pollinators are actively foraging in the vicinity of the application. Never apply directly to flowers, foraging bees, or other beneficial insects.
- Avoid applications to flowering plants that are attractive to bees.[7] If no alternatives are available, do not apply to flowering plants within six weeks before bloom or three weeks before shipping and sale.
- Avoid use of trunk injections, basal bark applications, and soil drenches of clothianidin, dinotefuran, imidacloprid, or thiamethoxam on plants known to be attractive to pollinators. Reserve systemic application methods for high-value or specimen woody plants that require protection due to significant pest pressure and where other management options are not feasible.
- Do not apply in misting or fogging systems unless they are contained within closed greenhouses.
- Do not apply on lawns with clover, dandelions, or other flowering plants in bloom. Consider alternatives for grub management.

[7] Bees are attracted to a wide variety of plants that provide nectar and/or pollen. Some wind pollinated species are actively visited by foraging bees (e.g., oaks, ash, beech). Plants that are generally not highly attractive to bees are those with limited or inaccessible pollen and nectar, such as conifers, ornamental grasses, and some showy cultivars, such as hybrid roses with dense petal structure or some double-flowered or sterile floret cultivars.

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