D. Pesticide Safety

1. General Information

Pesticides are hazardous substances that can cause harm if used improperly. Federal and state pesticide laws and regulations are designed to protect people, crops, and the environment. These laws and regulations also indirectly protect the integrity of pest management systems. Without proper management of pesticides, a product could lose its effectiveness due to overuse, misuse, or other improper or illegal applications. Such misuse can also lead to restrictions or cancellation of a product's registration.

1.1. Pesticide Registration

All pesticides sold or distributed in the United States must be registered with the **United States Environmental Protection Agency (EPA)** under the requirements of the **Federal Insecticide Fungicide Rodenticide Act (FIFRA)**, unless they qualify for an exemption. In addition to federal registration, states also require product registration, which may be more restrictive. For example, some states require registration of "minimum risk pesticides" even though these products are exempt from federal registration. However, no state may authorize the registration or use of a pesticide that has not first been registered or exempted by EPA.

Pesticides are inherently toxic, meaning they have the potential to cause harm to living organisms. Under FIFRA, EPA may register only those pesticide uses that do not pose an unreasonable risk of harm to human health and the environment. The Agency's registration decisions are based on scientific data and a comprehensive assessment of the risks and benefits associated with the pesticide's intended use.

Before granting registration, EPA requires extensive scientific data on the pesticide's potential effects. This evaluation process, known as a **risk assessment**, examines the likelihood of harm to humans, wildlife, fish, plants, and other non-target organisms, including endangered species. It also considers the potential for contamination of surface water or ground water through runoff, leaching, or spray drift.

As a part of the registration process, EPA must also review and approve the product label. To reduce risks to human health and the environment, the label outlines specific conditions of use, including who may use the pesticide, where and how it may be used, and the allowable quantity and frequency of application. Once approved, EPA assigns a unique **EPA registration number** to the product. Pesticide labels are legal documents and applicators are required to follow all instructions; **the label is the law**.

IMPORTANT

The following statement is found on all registered pesticide labels in the United States:
"It is a violation of Federal law to use this product in a manner inconsistent with its labeling."

EPA is required to review each registered pesticide at least once every 15 years to ensure that it continues to meet current scientific and regulatory standards for safety and effectiveness. The Agency may also initiate a registration review or take other regulatory actions at any time during a pesticide's life cycle if new data or information warrant reevaluation. If EPA determines that a pesticide's continued use would result in unreasonable risks to human health or the environment, the Agency has the authority to suspend or cancel the pesticide's registration.

1.2. Pesticides and Food Safety

Under the **Federal Food, Drug, and Cosmetic Act (FFDCA)**, EPA is required to establish maximum allowable pesticide residue levels, known as **tolerances**, for food and feed crops. These tolerances are designed to protect consumers from exposure to potentially harmful pesticide residues in or on treated commodities. Tolerances, or exemptions from the requirement of a tolerance, are published in the Code of Federal Regulations at 40 CFR 180. More information about pesticide tolerances is available at *https://www.epa.gov/pesticide-tolerances/about-pesticide-tolerances*.

The **Food Quality Protection Act (FQPA)** of 1996 established a single, uniform standard for pesticide residue in food and feed. It required that all existing pesticide tolerances be reassessed to ensure that they meet the safety threshold of "a reasonable certainty of no harm" when the products are used according to their label. This standard is reassessed during EPA's registration review process, conducted at least once every 15 years, to ensure that each pesticide continues to meet current scientific and regulatory criteria.

Tolerances are enforced by the United States Department of Agriculture (USDA) and the Food and Drug Administration (FDA). **Compliance with food safety standards requires strict adherence to pesticide labeling**. **Violations such as exceeding the labeled application rate, applying a pesticide to an unlabeled crop, or harvesting before the labeled pre-harvest interval are considered illegal and unsafe.** If pesticide residues exceed the established tolerance, the affected crop cannot be sold or marketed, and is subject to seizure and destruction by federal or state authorities.

2. Certification of Pesticide Applicators

EPA classifies certain pesticides as having the potential to cause unreasonable adverse effects on the environment, or to pose risk of injury to applicators or bystanders unless users are specially trained in their proper handling and application. As a condition of registration, EPA may restrict these products (or specific uses of them) to certified applicators or those under their direct supervision. These products are designated as **"restricted use pesticides" (RUPs)** and may only be applied by, or under the direct supervision of, trained and certified users.

In 1972 under FIFRA, EPA required states to establish programs to train and certify applicators of RUPs to ensure these products are used safely without endangering human health or the environment. Applicators become certified by demonstrating their competency to apply or supervise the use of RUPs, typically by passing an examination. Certification requirements and procedures can vary by state and may be more restrictive than federal standards. For example, **most states require certain individuals to be certified applicators to use ANY EPA-registered pesticide,** not just those classified as restricted use.

Certified pesticide applicators are classified as either private or commercial, as defined below.

Private Applicator. Any person who uses or supervises the use of RUPs to produce an agricultural commodity on property owned or rented by the applicator or the applicator's employer. Examples of private applicators include vegetable or fruit growers, greenhouse growers, and ranchers that apply RUPs only within their own operations. Note that agricultural producers in New Jersey who use **ANY** pesticide must be certified and licensed as private applicators, unless they qualify for a specific exemption [For more information, see New Jersey Administrative Code (NJAC) 7:30-8.1 at *https://dep.nj.gov/wp-content/uploads/rules/rules/njac7_30.pdf*].

Commercial Applicator. Any person who uses or supervises the use of **ANY** pesticide on a "for-hire" basis, or applies pesticides as a part of their job duties not covered under the definition of a private applicator. This includes employees of federal and state government agencies. Examples of commercial applicators in agriculture include individuals working for pesticide businesses that provide application services during the growing season.

EPA REVISIONS TO THE CERTIFICATION AND TRAINING STANDARDS OF PESTICIDE APPLICATORS

In 2017, EPA finalized revisions to 40 CFR Part 171 to strengthen national standards for pesticide applicator certification and training. The updated rule raises competency standards for core pesticide knowledge, requires specialized certifications for individuals using specific application methods (*e.g.*, fumigation and aerial), and establishes a nation-wide minimum age of 18 for certified applicators and those working under their direct supervision, among other provisions. For complete details, see *https://www.epa.gov/pesticide-worker-safety/certification-standards-pesticide-applicators*.

Each state was required to submit a revised certification and training plan to the EPA by November 2023, outlining how it would implement these changes. All state pesticide regulatory agencies must adopt and enforce the updated standards for both private and commercial applicators, unless their existing regulations already meet or exceed the federal requirements. Because most states must revise their pesticide regulations to align with the federal rule, implementation timelines will vary by state.

For state-specific regulatory changes regarding certification and training, contact your state pesticide regulatory agency or your state Cooperative Extension Pesticide Safety Education Program.

D. Pesticide Safety

When agricultural establishments hire commercial pesticide application services, they must verify that the supervising applicator is certified as a commercial applicator in the state where the application will occur. The applicator's certification must include the appropriate category of use required by the state for the application being made (*e.g.*, Agricultural Pest Control, Agriculture Plant Pest Control, Aerial Application, Fumigation of Soil and Agricultural Products).

3. The Pesticide Label

Directions for the correct, safe, and legal use of any pesticide are always found on the product label. Pesticide labels contain essential information, including the brand or trade name, the amount of active ingredient, directions for use, environmental hazards, first aid information in case of an accident, and storage and disposal instructions.

Each pesticide product must display its EPA registration number on the container label. This number serves as a unique identifier and is critical in cases of accidental poisoning, claims of misuse, poor performance, phytotoxicity, or liability claims.

3.1. Labels and Labeling

Pesticide applicators are legally obligated to follow the labeling found on and accompanying the pesticide container in their possession. Labels are the written, printed, or graphic materials that appear on or are attached to the pesticide, its device, or any of its containers or wrappers. "Labeling" includes the label itself and any technical bulletins, circulars, leaflets, or other printed or graphic materials referenced by the label or distributed with the product. Advertising materials that do not accompany the product are not considered labeling.

The **Safety Data Sheet SDS** [formerly known as the Material Safety Data Sheet (MSDS)], is prepared by the manufacturer or importer and describes the physical and chemical properties of a hazardous chemical in accordance with specific regulatory guidelines. The SDS becomes part of the pesticide labeling only when it accompanies the pesticide during distribution or sale.

Webpages cited on or within the label are legally considered part of the labeling. This includes cases where a label contains a Quick Response (QR) Code linking to consumer information. Other examples include labels that provide a web link for access to required EPA-approved training or Endangered Species Protection Bulletins.

"Web-distributed labeling" is legally valid, enforceable pesticide labeling that is accessible online. The product label provides a link that directs users to the website containing the web-distributed labeling. The complete online label must be printed and in the possession of the applicator when using the product. Web-distributed labeling is currently voluntary for pesticide manufacturers and has not been widely adopted.

Except for "web-distributed labels" or specific links found directly on the product label, **pesticide labels downloaded from the internet are NOT considered legal documents**. Sources of online labels include state regulatory agencies, EPA, and labeling services such as Kelly Solutions, CDMS, the National Pesticide Information Retrieval System (NPIRS), and others. These sources typically include disclaimers stating that the labels are only "specimens." While online labels may be useful for reference, they should not be substituted for the labeling distributed with and on the pesticide container. Product formulations and label directions can change over time. Even if a container looks identical to a previous purchase, never assume it contains the same product or labeling.

Labeling may also include **Supplemental Labels** distributed with the product or available online from the manufacturer. These partial labels are EPA-approved for new uses not previously registered and are typically incorporated into future product labels. Supplemental labels must include the product's EPA registration number, and direct users to the main label for complete instructions and precautions. Another type of Supplemental Label is the "**Section 24(c) Local Needs**" label, issued by a state regulatory agency to authorize additional uses of a federally registered pesticide, or a new end-use product to meet special local needs. Applicators must comply with both the product label and any supplemental labeling to use these products safely and legally. When using a pesticide according to supplemental label directions, **applicators must have both the product label AND supplemental labeling in their possession during use.**

3.2. Label Statements

Under FIFRA, each pesticide product label must include hazard and precautionary statements addressing risks to humans and domestic animals. Hazard statements identify the type of harm that may occur, while precautionary statements direct or inform users on how to prevent or reduce exposure to identified hazards. EPA's decision to register a pesticide product is partially based on the expectation that applicators will adhere to the label's use directions, restrictions, and precautionary measures. This section outlines key labeling statements commonly found on pesticides.

3.2.1 Restricted Use Pesticide Classification Statement

The restricted use statement and its justification must appear prominently at the top of the label's front panel. EPA assigns a restricted use classification when a pesticide or its application poses elevated risks, such as high acute toxicity, a history of accidents, or potential oncogenic (cancer), teratogenic (birth defects), fetotoxic (developmental), or reproductive (*e.g.*, reduced sperm count) effects, or when it threatens groundwater quality or wildlife.

As a condition of registration, any pesticide designated as restricted use must include the following statement: "For retail sale to and use only by certified applicators or persons under their direct supervision and only for those uses covered by the certified applicator's certification."

The RUP statement must also specify the reason for the restriction. The RUP statement for a product containing the active ingredient atrazine is depicted in the box directly below**.** The label signal word for this product is "Caution" and would not normally warrant RUP classification based on acute toxicity. However, in this instance, EPA has restricted its use to certified applicators and those under their direct supervision due to concerns about contamination of ground and surface water.

RESTRICTED USE PESTICIDE

(GROUND AND SURFACE WATER CONCERNS)

FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

THIS PRODUCT IS A RESTRICTED-USE HERBICIDE DUE TO GROUND AND SURFACE WATER CONCERNS. USERS MUST READ AND FOLLOW ALL PRECAUTIONARY STATEMENTS AND INSTRUCTIONS FOR USE IN ORDER TO MINIMIZE POTENTIAL FOR ATRAZINE TO REACH GROUND AND SURFACE WATER.

EPA may impose more stringent RUP statements for certain products based on risk management decisions. Paraquat is a recent example; its label includes the statement: "Restricted Use Pesticide due to acute toxicity. For retail sale to and use only by Certified Applicators Only - Not to be used by uncertified persons working under the supervision of a certified applicator." Refer to section D 3.3.2 for further details.

In addition, some states may impose further restrictions on a RUP, such as limiting sales to certain certified applicators, or requiring additional training. C**ontact your state pesticide regulatory agency or your state Cooperative Extension Pesticide Safety Education Program for state-specific requirements and regulations.**

3.2.2 Signal Words

An important feature of pesticide labels is that they are required by law to carry certain "**signal words**" on the front panel of the label to indicate the product's relative acute toxicity to humans. The signal word on EPA-registered pesticide products can be **DANGER**, **WARNING**, or **CAUTION**. Signal words alert users to the acute (short-term) toxicity of the pesticide formulation.

The signal word is assigned based on results from a series of acute toxicity studies conducted on the complete product formulation, not just the active ingredient. These studies include acute oral, dermal, and inhalation toxicity tests, as well as evaluations of primary eye and skin irritation and dermal sensitization. Systemic toxicity is assessed through all exposure routes, while eye and skin studies measure irritation or corrosive effects, and dermal sensitization tests determine the potential for allergic contact dermatitis. Toxicity data are derived from laboratory studies conducted on small mammals, such as rats or mice. These studies typically measure the lethal dose (LD_{50}) or lethal concentration (LC_{50}) that results in death for 50 percent of test animals following a single or short-term exposure.

D. Pesticide Safety

EPA classifies pesticide acute toxicity into four categories (I - IV) based on LD_{50} or LC_{50} data, as outlined in the Code of Federal Regulations at 40 CFR 156.62. A chemical is considered highly toxic when the LD_{50}/LC_{50} value is low (Toxicity Category 1) and practically non-toxic when the value is high (Toxicity Category IV).

- **EPA Toxicity Category I: DANGER POISON *(in red)***. Highly toxic, causing acute systemic illness if ingested, absorbed through the skin, or inhaled. The approximate lethal dose by ingestion ranges from a taste to a teaspoon. Products labeled "Danger-Poison" must display the skull and crossbones symbol, the word "POISON" prominently printed in red on a contrasting background, and a first aid statement that includes treatment instructions and antidotes if applicable.

- **EPA Toxicity Category I: DANGER**. Highly toxic due to corrosivity, causing irreversible damage to the skin or eyes. The word "Poison" must not be used for Category I products when the determining effect is corrosivity rather than systemic toxicity (from oral, inhalation, or dermal exposure).
- **EPA Toxicity Category II: WARNING**. Moderately toxic if ingested, absorbed through the skin, inhaled, or if it causes moderate eye or skin irritation. The approximate lethal dose by ingestion ranges from a teaspoon to an ounce.
- **EPA Toxicity Category III: CAUTION**. Slightly toxic if ingested, absorbed through the skin, inhaled, or if it causes slight eye or skin irritation. The approximate lethal dose by ingestion ranges from an ounce to more than a pint.
- **EPA Toxicity Category IV: None Required (CAUTION optional)**. This is the lowest EPA toxicity category (IV) for all routes of exposure (oral, dermal, inhalation) and indicates minimal or no eye or skin irritation. Products in this category do not require a signal word; however, manufacturer's may voluntarily use "Caution."

Table D-1. EPA Signal Words According to Toxicity Categories (I, II, III, IV) of Pesticide Products[1]

Study	Category I		Category II	Category III	Category IV
	 **Danger Poison** *(in red)*	**Danger**	**Warning**	**Caution**	**None or Caution**
Acute Oral	$LD_{50} \leq 50$ mg/kg	–	$LD_{50} > 50$ - 500 mg/kg	$LD_{50} > 500$ - 5,000 mg/kg	$LD_{50} > 5{,}000$ mg/kg
Acute Dermal	$LD_{50} \leq 200$ mg/kg	–	$LD_{50} > 200$ - 2,000 mg/kg	$LD_{50} > 2{,}000$ - 5,000 mg/kg	$LD_{50} > 5{,}000$ mg/kg
Acute Inhalation	$LC_{50} < 0.05$ mg/liter	–	$LC_{50} > 0.05$ - 0.5 mg/liter	$LC_{50} > 0.5$ - 2 mg/liter	$LC_{50} > 2$ mg/liter
Primary Eye Irritation	–	Corrosive; irreversible destruction of ocular tissue; corneal involvement or irritation persisting more than 21 days	Corneal involvement or irritation clearing in 8-21 days.	Corneal involvement or irritation clearing in 7 days or less	Minimal effects clearing in less than 24 hours
Primary Skin Irritation	–	Corrosive (tissue destruction into the dermis and/or scarring)	Severe irritation at 72 hours (severe erythema or edema)	Moderate irritation at 72 hours (moderate erythema)	Mild or slight irritation (no irritation or slight erythema)
Dermal Sensitization	Positive		Negative		
	Product is a sensitizer or is positive for sensitization		Product is not a sensitizer or is negative for sensitization		

[1] Adapted from EPA Label Review Manual Chapter 7, rev March 2018.

Assignment of Signal Words

The signal word is determined by the most severe toxicity category assigned from the six required acute toxicity studies (see Table D-1). For example, if a pesticide product is classified as Toxicity Category III for dermal exposure but Category II for inhalation, the signal word "WARNING" would appear on the label, reflecting the more hazardous Category II. A signal word is required on all registered pesticide products unless the product falls within Toxicity Category IV for all exposure routes and shows no evidence of dermal sensitization.

Signal Words alert applicators to the relative acute toxicity associated with short-term exposure during pesticide use. However, it is important to understand that LD_{50} and LC_{50} values are limited to assessing acute toxicity and do not provide a complete picture of a pesticide's health risks. For instance:

- They do not account for less severe acute effects, localized irritation, or delayed systemic effects.
- They do not account for long-term health effects (*i.e.*, cancer, birth defects, or developmental/reproductive toxicity) that may occur at exposure levels below those that cause death.
- They do not translate directly to humans because human physiology differs from that of test animals (*e.g.*, rats, mice, etc.).
- They reflect toxicity from a single exposure and do not account for cumulative effects from repeated or chronic exposure.

The results of the six acute toxicity studies also determine the appropriate precautionary statements for humans and domestic animals, personal protective equipment (PPE) requirements, and first aid statements. Products classified in Toxicity Categories I, II, or III, or those that test positive for skin sensitization, must include a "Hazards to Humans and Domestic Animals" section. This section may contain both mandatory actions and advisory information.

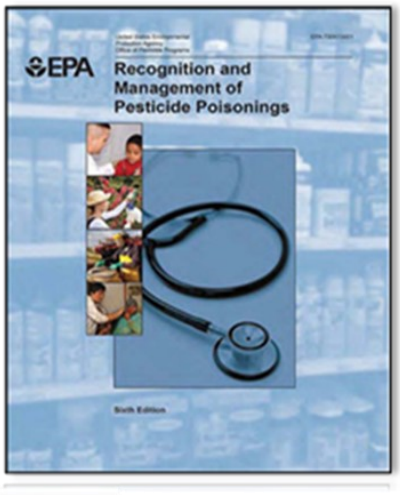
IMPORTANT

Hazard is a function of both toxicity and exposure.

The danger in handling pesticides does not depend exclusively on toxicity of the product. Even relatively low-toxicity pesticides can pose hazards if label instructions are not followed. Do not confuse the acute hazard indicated by signal words with overall risk! A compound may be highly toxic but presents little hazard to the applicator if exposure is limited. Conversely, a compound of relatively low toxicity may pose a significant hazard if exposure is frequent, prolonged, or occurs at high levels.

3.2.3 First Aid Statements

First aid statements on pesticide labels outline the immediate steps to take in the event of accidental exposure, and may guide medical professionals in treating pesticide poisoning. These statements are mandatory for products in Toxicity Category I, II, or III, and may also appear for specific use dilutions listed on the label.



Before using any pesticide, review the "First Aid" section of the label so you can recognize early signs or symptoms of poisoning or contact-related effects in yourself or others. Prompt recognition and immediate response can prevent serious injury or save a life.

The "*Recognition and Management of Pesticide Poisonings: 6th Edition*" manual serves as a quick reference for healthcare providers, offering toxicology information and treatment guidance for pesticide exposures. It is available for free download in full or by chapter at https://www.epa.gov/pesticide-worker-safety/recognition-and-management-pesticide-poisonings. A Spanish language version is also available online.

Do not wait until you or someone else becomes dangerously ill before contacting a physician or going to a hospital. It is better to be too cautious than to act too late. **Any time you experience a medical emergency related to pesticide use, call 911 immediately**. Prompt action and treatment may save a life.

Seek medical attention immediately if you or any of your coworkers develop unusual or unexplained symptoms within 24 hours of pesticide exposure. If you experience any of the following symptoms during or shortly after using pesticides - headache, blurred vision, pinpoint pupils, weakness, nausea, cramps, diarrhea, or discomfort in the chest - **call a physician or the National Poison Control Center hotline (1-800-222-1222).** This toll-free number is available nationwide and provides first aid guidance and referrals to local treatment centers. **Bring the pesticide label with you**, either a duplicate copy or a photo of the one attached to the container (or at minimum, record the EPA registration number of the product) when seeking medical care. To prevent further exposure, never transport pesticide containers in the passenger area of a vehicle.

If you are having a medical emergency after using pesticides, always call 911 immediately.

POISON Help®
1-800-222-1222

In Case of an Accident

- **Remove the person from exposure**
- **Get away from the treated or contaminated area immediately**
- **Remove contaminated clothing**
- **Wash with soap and clean water**
- **Call a physician and/or the National Poison Control Center (1-800-222-1222). Your call will be routed to your State Poison Control Center.**
- **Have the pesticide label with you!**
- **Be prepared to give the EPA registration number to the responding center/agency**

3.2.4 Other Label Statements

If risks or concerns are identified during the risk assessment process, EPA evaluates appropriate risk management strategies. Precautionary statements intended to reduce risk are included on the pesticide label, such as:

- Reducing application rates or modifying directions for use;
- Extending the restricted-entry interval (REI);
- Requiring engineering controls, such as closed systems for mixing and loading, to minimize worker exposure;
- Following safe handling procedures to prevent spills;
- Avoiding pesticide application when crops are in bloom to protect pollinators; or
- Establishing buffer zones of unsprayed areas near water bodies to reduce runoff and surface water contamination, among other measures.

In some cases, EPA may approve a pesticide for use only if specific risk mitigation measures are implemented. In other cases, a pesticide may not be re-registered for certain use sites (or at all) if risks are deemed unacceptable. When EPA determines that labeling alone is insufficient to mitigate pesticide-related risks, it may require additional, more stringent risk reduction measures. Refer to section D 3.3 for recent label changes that support the continued registration of certain pesticide products.

3.3. Significant Labeling Changes

3.3.1 Soil Fumigants

EPA has required specific safety measures to protect handlers, re-entry workers, and bystanders from exposure to the soil fumigants **chloropicrin, dazomet, 1,3-dichloropropene, dimethyl disulfide, metam sodium/potassium, and methyl bromide**. Because these fumigants are applied as gases, they can volatilize from the soil into the air and drift off-site at concentrations that may cause adverse health effects hours or even days after application. Health effects vary by fumigant and exposure level, ranging from mild, reversible eye irritation to more serious and potentially irreversible outcomes.

To address these risks, EPA has incorporated revised safety measures into the product labels. Each of these fumigants is now classified as a RUP due to acute toxicity and **may only be applied by certified applicators or individuals under their direct supervision.** Labels further specify that only trained handlers may assist with application. These fumigants are among the first pesticide groups to require product-specific, label-mandated training. EPA-approved soil fumigant training for certified applicators must be completed every 3 years unless a state certification category fulfills the label requirement. Training resources are available at *https://www.epa.gov/soil-fumigants/soil-fumigant-training-certified-applicators*.

IMPORTANT FEDERAL REGULATORY CHANGE FOR SOIL FUMIGATION

Under revised federal pesticide applicator certification regulations, all state pesticide regulatory agencies are now required to implement separate, method-specific soil fumigation certification for both private and commercial applicators, if such certification is not already provided under current state pesticide regulations. Because these changes often necessitate revisions to state pesticide regulations, the implementation dates will vary by individual state. If you hire commercial fumigators, ensure that their license category is valid for your state.

For state-specific regulatory changes regarding certification and training, contact your state pesticide regulatory agency or your state Cooperative Extension Pesticide Safety Education Program.

In addition, soil fumigant labels require applicators to prepare a site-specific **Fumigation Management Plan (FMP)** before application. EPA provides chemical specific FMP templates to meet this requirement; see *https://www.epa.gov/soil-fumigants/fumigant-management-plan-templates-phase-2-files-listed-chemical*.

Applicators may also develop their own FMP or use one provided by a third party. Labels further inform users that some states and tribal authorities require advance notification before fumigant application. EPA maintains a list of these jurisdictions and their contact information at *https://www.epa.gov/soil-fumigants/complying-required-state-and-tribal-notification-soil-fumigations*. In the Mid-Atlantic region, Maryland and West Virginia currently require applicators to notify the state pesticide regulatory agency before applying soil fumigants.

3.3.2 Paraquat Dichloride (Paraquat)

Paraquat dichloride (commonly referred to as "paraquat") is highly toxic to humans. Even a small accidental sip can be fatal, and there is no known antidote. Dermal or eye contact can also cause serious lasting effects. Due to widespread public concern and EPA's analysis of incident data, the agency initiated a comprehensive review of paraquat-related health incidents ahead of its standard 15-year registration review cycle.

EPA's "Paraquat Dichloride Human Health Mitigation Decision" required changes to the permitted uses of paraquat to reduce the risk of human health incidents. These risk mitigation measures were based on the frequency and severity of reported poisonings and misuse.

Sample revised RUP statement for a paraquat product label.

D. Pesticide Safety

To meet FIFRA registration standards, EPA determined that the following risk mitigation measures are necessary for continued registration of paraquat-containing products:

- Paraquat use is restricted to certified pesticide applicators only (see RUP statement graphic on the previous page).
- Noncertified individuals, even those working under the supervision of a certified applicator, are prohibited from using paraquat (including mixing, loading, applying, or performing any other pesticide-related activities).
- Applicators must complete an EPA-approved paraquat training program every three years to legally mix, load, apply, or handle paraquat.
- Pesticide labels and warning materials have been updated (see cap seal to right) to clearly communicate the extreme toxicity and associated risks of paraquat.
- New closed-system packaging has been introduced to prevent transfer or removal of the pesticide except directly into approved application equipment.

Paraquat Cap Sticker

All paraquat handlers are required to complete EPA-approved training every three years and maintain documentation of successful completion. EPA-approved paraquat training for certified applicators is available online in both English and Spanish at *https://npsec.us/paraquat*.

3.3.3 Chlorpyrifos

Chlorpyrifos is an organophosphate insecticide commonly used in agriculture to control a variety of pests on food and feed crops. Due to concerns about its potential neurotoxic effects (refer to section D 4.1 for medical monitoring information), especially in children, EPA revoked all food tolerances for chlorpyrifos in 2021. This decision was later challenged in the U.S. Court of Appeals for the Eighth Circuit. On November 2, 2023, the court vacated EPA's 2021 final rule, and on December 28, 2023, reinstated all chlorpyrifos tolerances, consistent with labeled directions for use.

These regulatory developments followed earlier EPA efforts to refine chlorpyrifos tolerances based on crop-specific risk assessments. Prior to revoking all food tolerances, EPA had identified 11 crops (alfalfa, apples, asparagus, tart cherries, citrus, cotton, peaches, soybeans, strawberries, sugar beets, and spring and winter wheat) as candidates for modified tolerances in its 2020 Proposed Interim Decision (PID) for chlorpyrifos. Following this guidance, registrants in 2022 began voluntarily requesting cancellation of food and feed uses not associated with those 11 crops. Updated labels reflecting these cancellations and geographic/application restrictions identified in the 2020 PID were approved by EPA on September 30, 2024. The registration review for chlorpyrifos remains ongoing. EPA plans to issue an amended PID for public comment in 2026. The Agency will continue to keep the public informed about its evaluations and any future regulatory actions related to chlorpyrifos use.

IMPORTANT
Growers are advised to verify the current legal status of chlorpyrifos with their state pesticide regulatory agency or state Cooperative Extension Pesticide Safety Education Program before considering its use. Growers are also reminded that additional restrictions may apply based on geographic location and application rate.

4. Handling Pesticides

4.1. Prior to Pesticide Application

Use pesticides only on crops specified by the product label, and only those products that have both state and federal registration. Using a pesticide in any manner not explicitly authorized by the label is a violation of federal law. Before applying pesticides, applicators must carefully read and follow all label directions and precautions.

Consult the "Precautionary Statements" section for all legally required PPE. Refer to sections D 5.2.1 and D 5.2.2 for further guidance on selecting and using PPE in accordance with label directions. When a pesticide label

requires the use of a respirator, applicators must undergo a medical evaluation and receive clearance to use the respirator under the specified conditions. Refer to section D 5.2.2 for details.

Ensure that all pesticide application equipment is properly maintained, calibrated, and is in good working condition before use. Review the label's first aid statements and inform your physician about the types of pesticides you use. This is especially important for cholinesterase-inhibiting organophosphate and N-methyl carbamate pesticides, which may require medical monitoring (see box below). If a pesticide is a cholinesterase inhibitor, this will be indicated in the label's first aid section.

Before handling or applying pesticides, ensure access to clean water and soap for emergency washing. If eye protection is required, employers must provide at least one pint of water per handler in portable containers that are immediately accessible. Where protective eyewear is required for mixing or loading (or when using a closed system operating under pressure), employers must provide either a system capable of delivering gently running water at a rate of at least 0.4 gallons per minute for 15 minutes, or at least six gallons of water in containers suitable for providing a 15-minute eye-flush.

Medical Monitoring Cholinesterase-Inhibiting Pesticides

If you plan to use organophosphate or N-methyl carbamate pesticides, it is strongly recommended that you inform your physician. Monitoring of blood cholinesterase levels is advised for individuals who will be using these pesticides for more than 30 hours within any 30-day period. Before the spray season begins, the applicator should establish a baseline blood cholinesterase level. The baseline should be re-evaluated using the same lab once the 30-hour threshold is reached or exceeded during the season.

The Migrant Clinicians Network provides a website, "Cholinesterase Testing Protocols for Healthcare Providers," that outlines protocols for when medical removal from pesticide-related duties is necessary and when return to work is appropriate; see *https://www.migrantclinician.org/toolsource/resource/cholinesterase-che-testing-protocols-and-algorithm-healthcare-providers.html*.

4.2. Pesticide Application and Recordkeeping

Always keep the pesticide label accessible during application. In addition, keep the following points in mind.

- Do not handle or apply pesticides if you have a headache or are not feeling well.
- Never smoke, eat, drink, or use cell phones while handling pesticides.
- Avoid inhaling pesticide sprays, dust, or vapors. If respiratory protection is required, the label will specify the type of respirator needed (refer to section D 5.2.2).
- Wash hands and exposed skin thoroughly before eating, drinking, using tobacco products, using the bathroom, or using your cell phone. Wash gloves with soap and water before removing them, then wash your hands and face.
- If hands, or other body parts become contaminated, wash immediately with clean water and soap. If clothing becomes contaminated, remove it immediately. Garments soaked with concentrated pesticide must be discarded and should not be washed or reused.
- After each application, bathe and change into clean clothes; always begin the day with clean clothing. Wash clothing used during an application separately from other garments and run an additional rinse cycle afterwards.
- Always have another person present or nearby when using highly toxic pesticides (those with the signal word DANGER and the skull and crossbones symbol).

Always follow a pesticide label's "Directions for Use" exactly. This section specifies who may use the product, where and how it may be applied, and the application rate and frequency. Never exceed the labeled application rate. In addition to mandatory statements, labels may also include advisory information to optimize effectiveness.

Application Records (Private Applicators Only)

On July 11, 2025, USDA ended the federal rule (Title 7, Part 110 of the Code of Federal Regulations) requiring private applicators to maintain records of RUP applications. Although this rule is no longer federally enforceable, some states may still require similar documentation. In addition, EPA has included some of the same recordkeeping requirements in its Worker Protection Standard (WPS). The WPS requires growers who hire agricultural workers or handlers to make, maintain, and post pesticide application information and SDSs for all pesticides in a central

area no later than 24 hours after an application (refer to section D 5.1 for details). **Under WPS recordkeeping requirements, pesticide records must include:**

1. Name of the pesticide applied;
2. Active ingredient;
3. EPA registration number;
4. REI;
5. Crop or site treated;
6. Location and description of the treated area(s);
7. Date(s) and times application started and ended; and
8. SDS of the pesticide applied.

Applicators are strongly encouraged to maintain detailed pesticide records, even if not required by federal or state laws. Maintaining thorough records remains a good management practice. Many applicators view their pesticide records as valuable protection against false accusations or compliance disputes. Records document proper application and are among the first items regulators review when investigating a complaint. Consider treating each record as if it were evidence in a legal proceeding. **Always verify your state's current pesticide recordkeeping requirements to ensure compliance.**

State-Specific Pesticide Application Recordkeeping

Some state pesticide regulations may require private applicators to maintain application records for restricted use pesticides, as well as general-use pesticides, and may specify different retention periods. **Applicators must keep records of all pesticide applications in accordance with their state's requirements.** See below for links to individual state recordkeeping information and templates. The templates provided are offered as a courtesy and are not regulatory documents. Several states have incorporated WPS-required recordkeeping elements into these templates, which may be used by agricultural establishment owners to meet compliance obligations.

- **Delaware** pesticide regulations require commercial applicators and RUP dealers to maintain records for two years (see 601 Delaware Pesticide Rules and Regulations, Section 14). A template recordkeeping form provided by the Delaware Department of Agriculture is available at *https://agriculture.delaware.gov/wp-content/uploads/sites/108/2024/08/1405_001.pdf*.

- **Maryland** pesticide regulations require all pesticide license/permit holders to maintain pesticide records (both general- and restricted use) for two years. Specific recordkeeping requirements for private applicators (Maryland Code of Regulations 15.05.01.7) are located at *https://mda.maryland.gov/plants-pests/SiteAssets/Pages/Pesticide-Information-for-Professionals/COMAR%2015.05..01%2010.22%20%281%29.pdf*. A template recordkeeping form provided by the Maryland Department of Agriculture is available at *https://mda.maryland.gov/plants-pests/Documents/records.pdf*.

- **New Jersey** pesticide regulations require all pesticide license holders to maintain pesticide records (both general- and restricted use) for three years. Specific recordkeeping requirements for private applicators (NJAC 7:30-8.8) are located at *https://dep.nj.gov/wp-content/uploads/rules/rules/njac7_30.pdf*. A template recordkeeping form provided by the Rutgers Pesticide Safety Education Program is available at *https://pestmanagement.rutgers.edu/pat/record-forms-2-2/*.

- **Pennsylvania** pesticide regulations require pest management consultants, pesticide applicator businesses, and private applicators to maintain records for three years. Specific recordkeeping requirements for private applicators (Pennsylvania Code 7 § 128.65) are located at *https://www.pacodeandbulletin.gov/Display/pacode?file=/secure/pacode/data/007/chapter128/s128.65.html&searchunitkeywords=recordkeeping&origQuery=recordkeeping&operator=OR&title=007%20AGRICULTURE*. A template recordkeeping form provided by PennState Extension is available at *https://extension.psu.edu/recordkeeping-form-for-pesticide-applicators*.

- **Virginia** pesticide regulations require pesticide businesses, commercial applicators, and registered technicians who are not-for-hire to maintain records for two years (see Virginia Administrative Code 680-65 and 685-210). A template recordkeeping form provided by Virginia Tech Pesticide Programs is available at *https://vtpp.ento.vt.edu/applicators.html*.

- **West Virginia** pesticide regulations require all licensed pesticide applicators to maintain application records for two years. Private pesticide applicators are only required to keep records of RUPs. Specific recordkeeping requirements for private applicators (West Virginia Legislative Rule § 61-12A-9) are located at *https://agriculture.wv.gov/wp-content/uploads/Certified-Pesticide-Applicator-Rules-61-12A.pdf*.

For additional information on pesticide application recordkeeping for applicators or agricultural establishments, contact your state pesticide regulatory agency or state Cooperative Extension Pesticide Safety Education Program.

4.3. Pesticide Transport

When transporting pesticides, all containers must be securely fastened to prevent movement, breakage, or spillage. If containers are made of glass, they should be padded and secured to avoid breakage. Containers larger than five gallons should be firmly braced to a structural part of the vehicle to minimize the risk of accidental spills. Always carry absorbent materials to contain or soak up liquid spills. Keep a shovel and/or broom and dustpan in the vehicle to assist with clean up. If transporting flammable pesticide products, a functioning fire extinguisher (10-B:C dry chemical, or carbon dioxide) must be readily accessible.

Pesticides must be stored in a compartment separate from the driver during transport, such as the bed of a pickup truck or a van equipped with a secure partition. All pesticide containers and related equipment must be locked or otherwise secured to prevent removal by unauthorized person(s) when the vehicle is unattended. Any service vehicle tank containing pesticides must have a cover or hatch that will prevent spillage while the vehicle is in motion.

For additional information on pesticide transport, contact your state pesticide regulatory agency or state Cooperative Extension Pesticide Safety Education Program.

4.4. Pesticide Storage

Improper storage of pesticides can lead to accidental poisoning, environmental contamination, or degradation of the chemicals themselves. Pesticides should always be stored in their original containers with lids tightly closed. **NEVER transfer pesticides into food or beverage containers**. Store pesticides (and empty containers still contaminated with residues) in a cool, dry, well-ventilated area that is inaccessible to children and others unfamiliar with their safe use. For the protection of others, and especially in case of fire, the storage area should be clearly marked as "*Pesticide Storage"* and kept securely locked, regardless of whether the products are classified as general or restricted use.

Minimize the quantity of pesticide products stored by planning purchases carefully so that supplies are used by the end of the growing season and do not require storage over the winter. Mark the purchase or delivery date on the product label using a permanent marker or indelible ink. Check and record expiration dates if listed on labels. EPA regulations require pesticide manufacturers to include the statement "Not for sale or use after [date]" in a prominent position on the label if the active ingredient is known to degrade over time.

Always read the label before storing a pesticide. Most labels include a general statement such as, "Do not contaminate water, food, or feed by storage or disposal." Additional, specific storage recommendations or restrictions may also be included. Moisture control is especially critical for dry formulations, such as granules and wettable powders, which can readily absorb water. In such cases, the label may include the statement, "Store in a dry place."

If a pesticide must be transferred to a different container (*e.g*., the original container is leaking), the new container must be properly labeled. The label must include the product's brand or trade name, EPA registration number, active ingredient(s) and their percentages, signal word, and precautionary statements. If the pesticide has been diluted, the label should also include the dilution ratio.

Maintain an up-to-date inventory of all pesticides in storage and keep a copy of this inventory in a separate, accessible location for use in emergencies. **Inform the local fire department of all pesticide storage locations.** Fires involving pesticides can produce highly toxic smoke and pose serious risks to nearby residents or communities, sometimes requiring evacuation. Some states require applicators to submit pesticide storage inventories annually to local fire departments or emergency response agencies. Note that **New Jersey pesticide applicators must submit their inventory, along with a written description or depiction of the location of the**

storage area, to their local fire department by May 1st each year. Inventory and cover letter templates are available from the Rutgers Pesticide Safety Education Program at *https://pestmanagement.rutgers.edu/pat/record-forms-2-2/*.

Inspect Product and Container Conditions

Routinely inspect the condition of pesticide products and their containers while in storage. During the pesticide registration process, manufacturers are required to include label statements that specify where and how the pesticide must be stored. Always store pesticides within the temperature range indicated on the label. Improper storage can reduce product effectiveness and accelerate deterioration.

Cold Weather Storage

Consult the "Storage and Disposal" section of the label to determine whether the product can freeze without adverse effects. Some labels may state that frozen products can be reused after proper warming. Before attempting to thaw a frozen pesticide, inspect the container for cracks or ruptures caused by expansion. To thaw, place the container in a warm storage area, 50-80°F (10-27°C) and gently shake or roll it every few hours to remix the contents and eliminate layering. If crystals remain or the product does not fully reconstitute, do not use it. When in doubt, contact the manufacturer for guidance. For information on disposing of deteriorated products, refer to section D 4.5.

4.5. Disposal of Pesticides

Pesticide waste can be hazardous. Improper disposal of excess product, spray mixture, or rinsate is a violation of federal law. Do not contaminate water, food, or feed through improper storage or disposal. Pesticides and empty containers that still contain residues must not be disposed of in sanitary landfills.

The federal **Resource Conservation and Recovery Act (RCRA)** regulates the management and disposal of hazardous waste. **Agricultural producers (or their commercial applicator contractor) may legally dispose of excess pesticide or rinsate by applying it to a labeled site on the farm, following all label directions** (see box). If this option is not feasible, the farmer may become subject to the hazardous waste provisions of RCRA. For detailed guidance on RCRA requirements, refer to EPA's "*Managing Your Hazardous Waste: A Guide for Small Businesses*" handbook at *https://www.epa.gov/hwgenerators/managing-your-hazardous-waste-guide-small-businesses*.

FARMER EXCLUSION

The RCRA regulates the management and disposal of hazardous wastes, including pesticides.

"*…Although a farmer may be a generator of hazardous waste, waste pesticides disposed of on a farmer's own property in compliance with specified waste management requirements, including the disposal instructions on the pesticide label, are not subject to the generator requirements. This exclusion is intended to prevent the double regulation of farmers under both RCRA and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)…"*

Policy interpretation excerpted from the 2014 EPA ***RCRA Orientation Manual*** (*https://www.epa.gov/sites/default/files/2015-07/documents/rom.pdf*) .

Always consult the pesticide label for disposal instructions, as some products include specific requirements for disposing of the pesticide itself, unrinsed containers, or rinsate.

State-Specific Pesticide Disposal Programs

Many states offer pesticide disposal programs tailored specifically for farmers and commercial pesticide users. These programs provide safe disposal options for unwanted pesticides through state-funded drop-off events or scheduled pick-up services. Program details, including eligibility, accepted materials, collection procedures, and event dates, vary by state. Check with your state pesticide regulatory agency for current program information.

- The **Delaware** Department of Agriculture sponsors the Environmental Sweep Program (ESP), an initiative that offers free, convenient, and environmentally responsible disposal of unwanted, outdated, or cancelled pesticides to qualifying individuals and businesses in all three counties. Farmers, commercial applicators, nurseries, greenhouses, golf courses, and pest control businesses may qualify for on-site removal of up to 500 pounds or 50 gallons of pesticides through this program. For safety and convenience, pesticides are collected directly from

participants by a licensed waste disposal contractor. For more information, see *https://agriculture.delaware.gov/pesticide-management/environmental-sweep-program/*. Contact Jimmy Hughes: (302) 698-4569, or Chris Wade: (302) 698-4570 for more information.

- The **Maryland** Department of Agriculture (MDA) periodically sponsors a free pesticide disposal program for current and retired farmers and producers, including orchardists, nurserymen, greenhouse operators, and Xmas tree growers. To participate in the program, growers must complete and return a registration form to MDA's Pesticide Regulation Section. After applications are reviewed and verified through a site visit, MDA will arrange for a licensed hazardous waste hauler to collect the pesticides directly from the storage site and transport them to an approved disposal facility. For more information, see *https://mda.maryland.gov/plants-pests/Pages/Pesticide-Disposal-Program.aspx*.

- **New Jersey** does not have a state-sponsored pesticide waste disposal program. Farmers who qualify as "Hazardous Waste Generators" must comply with all RCRA disposal requirements. The requirements for hazardous waste generators are set forth at NJAC 7:26G-6, which references the Code of Federal Regulations 40 CFR Part 262 (with certain exceptions or modifications). For more information, refer to the New Jersey Department of Environmental Protection (NJDEP) "*Compliance Assistance Packet for Hazardous Waste Generators"* at *https://www.nj.gov/dep/enforcement/docs/compliance-assistance-packet-2020-v20-3.pdf*. For regulatory assistance related to hazardous waste disposal in New Jersey, contact the NJDEP Bureau of Hazardous Waste Compliance and Enforcement at your nearest regional office.
    - Northern Regional Office: (973) 656-4470, serving Bergen, Essex, Hudson, Hunterdon, Morris, Passaic, Somerset, Sussex, and Warren Counties.
    - Central Regional Office: (609) 943-3019, serving Mercer, Middlesex, Monmouth, Ocean, and Union Counties.
    - Southern Regional Office: (856) 614-3684, serving Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, and Salem Counties.

- The **Pennsylvania** Department of Agriculture's CHEMSWEEP provides farmers and other licensed pesticide applicators with a safe and legal means to dispose of unwanted pesticides, generally at little or no cost. Only pesticides that are or have been registered for sale or use in Pennsylvania are accepted. CHEMSWEEP operates in selected counties each year, and licensed farmers, professional applicators, and pesticide businesses in those counties are eligible to participate. For additional details and current year collection locations, see *https://www.pa.gov/agencies/pda/plants-land-water/plant-industry/environmental-programs/chemsweep*.

- **Virginia's** Pesticide Collection Program, administered by the Virginia Department of Agriculture and Consumer Services in partnership with Virginia Cooperative Extension and the Division of Consolidated Laboratory Services, assists agricultural producers, licensed pesticide dealers, pest control firms, golf courses and homeowners with proper disposal of unwanted pesticides. The program operates in a selected region of the state each year and is free to eligible participants. Collection events are held at designated sites where participants bring their pesticide materials for disposal. For additional details and current year collection locations, see *https://www.vdacs.virginia.gov/pesticide-collection.shtml*.

- The **West Virginia** Department of Agriculture sponsors pesticide waste disposal as part of its environmental programs. To participate, individuals complete and submit the "Application For Waste Pesticide Disposal" form at *https://agriculture.wv.gov/divisions/regulatory-and-environmental-affairs/pesticides/*. Pickup arrangements are made based on the quantity of material submitted. For more information, contact Devin Johnston: (304) 767-1608.

4.6 Disposal of Pesticide Containers

Disposal options for empty pesticide containers may be limited by local regulations, ordinances, and the availability of recycling programs. Properly rinsed containers that have been crushed or punctured may be accepted at sanitary or industrial waste landfills; always check with landfill operators before bringing empty containers for disposal. Note that pesticide containers must never be buried or burned for disposal.

Always refer to the current pesticide label for storage and disposal requirements. EPA's pesticide container regulations (40 CFR 156) establish standards for pesticide containers, repackaging, and label instructions to ensure safe use, reuse, disposal, and cleaning. It is the responsibility of the person disposing of the container to clean it before final disposal. **Applicators must follow all label instructions for cleaning and handling empty containers.** Container handling statements in the "Storage and Disposal" section of the pesticide label specify whether the container is refillable or non-refillable; whether the container can be reused, recycled, or reconditioned; how to dispose of the container if recycling or reconditioning are not options; and how to clean the container if cleaning is required.

After emptying a non-refillable or refillable container that held a dilutable pesticide, promptly triple rinse the container (or use an equivalent method, see below). Empty the rinsate into application equipment or a mix tank, or store it for later use or disposal according to label directions (refer to section D 4.5). Rinsate may be applied to a labeled site in accordance with the pesticide label.

To prepare containers for disposal or recycling, use either the triple rinse-and-drain method or the pressure-rinse method described below. Cleaning should be performed on a mixing and loading pad, or other containment structure that ensures rinse water is collected. Both the interior and exterior of the container must be thoroughly cleaned; **NO residues are acceptable**.

Triple Rinse-and-Drain Method: First, empty the pesticide container by holding it vertically for 30 seconds to drain the contents into the application equipment or mix tank. Add a solvent capable of removing the pesticide (such as water, if specified on the label), until the container is about one-fourth full. Agitate thoroughly, then drain the rinsate into the application equipment or mix tank for 30 seconds. Repeat this process two more times.

Pressure Rinse Method: This method uses a special rinsing device attached to a standard water hose. The device has a sharp probe (called a "stinger") and multiple spray jets. After draining the container into the application equipment or mix tank, insert the stinger through the bottom of the container and rinse for at least 30 seconds. The rinse water washes residue into the application equipment or mix tank for proper use, and the container is rendered unusable. Thirty seconds of pressure rinsing is considered equivalent to triple rinsing.

When either rinsing method is used, the container is considered legally "empty," but it must not be reused for any other purpose. Containers with visible residues that cannot be removed through standard cleaning are typically not accepted in recycling programs. If a container cannot be adequately cleaned, contact the pesticide manufacturer for disposal guidance. See the National Pesticide Information Center's online directory of pesticide manufacturers, formulators, producers, and registrants at *http://npic.orst.edu/ingred/manuf.html*.

For non-refillable bags containing granular or powdered formulations, completely empty the bag into application equipment by shaking and tapping the sides and bottom to loosen clinging particles. Failure to do so may result in the bag being classified as hazardous waste, requiring disposal in accordance with local, state, and federal regulations.

State-Specific Pesticide Container Recycling Programs

The status of pesticide container recycling services offered by several Mid-Atlantic states for containers that have been rendered empty through either triple or pressure rinsing is provided below. At the time of this writing, **Delaware, Maryland, and West Virginia** have indefinitely suspended their pesticide container recycling programs due to contractor-related issues.

- The **New Jersey** Agricultural Recycling Programs, administered by the New Jersey Department of Agriculture (NJDA), is available to agricultural, professional, and commercial pesticide applicators who hold a NJDEP pesticide license, as well as to state, county, and municipal government agencies. One core credit is awarded to pesticide license holders who complete the required processing steps and bring their license with them at time of collection. The program accepts non-refillable, high-density polyethylene #2 HDPE containers that are no larger than 55 gallons and that have been properly rinsed and are free of pesticide residues. For more details on recycling requirements, scheduling, and locations, see the NJDA webpage at *https://www.nj.gov/agriculture/divisions/anr/nrc/recycling.shtml*. Year-round collection sites are located at the Rutgers Fruit and Ornamental Research Extension Center at Cream Ridge, Monmouth County, and Allied Recycling in Mt. Holly, Burlington County. Contact the NJDA Recycling Program Manager: (609) 913-6490 for additional information on New Jersey's various agricultural recycling programs.

- The **Pennsylvania** Plastic Pesticide Container Recycling Program, administered by the Pennsylvania Department of Agriculture, provides licensed pesticide applicators a means to dispose of properly rinsed #2 HDPE plastic containers that are free of pesticide residues. An online map of statewide recycling locations, along with contact information, is available at *https://www.pa.gov/agencies/pda/plants-land-water/plant-industry/environmental-programs/plastic-pesticide-container-recycling-program*. For additional assistance with the recycling program, call: (717) 705-5858.

- The **Virginia** Plastic Pesticide Container Recycling Program, administered by the Virginia Department of Agriculture and Consumer Services in partnership with Virginia Cooperative Extension, assists agricultural, professional, and commercial pesticide applicators with the disposal of properly rinsed plastic pesticide containers that are free of pesticide residues. The program is available to any pesticide applicator or dealer in Virginia. More details on recycling requirements and locations are at *https://www.vdacs.virginia.gov/pesticide-container-recycling.shtml*. For additional assistance with the recycling program, call: (804) 371-6561.

Always refer to the label's "Storage and Disposal" requirements. For additional guidance on the disposal of pesticides, unrinsed containers, or rinsate, contact your state pesticide regulatory agency.

4.7 Pesticide Spills

In case of a pesticide spill, keep a supply of an absorbent agent on hand in the area where you store pesticides, as well as when transporting pesticide products. Industrial sorbents rated by sorption capacity and type of liquid are commercially available for containing liquids in a cleanup. Use label-prescribed PPE, including chemical-resistant gloves, when cleaning up spills. Allow the absorbent material to sit for a few hours to fully soak up the spilled pesticide from the surface. This procedure is also recommended for cleaning truck beds that are contaminated. For detailed cleanup guidance, contact the pesticide manufacturer or consult the product's SDS.

Reporting Pesticide Spills

Follow your state spill reporting protocol. Be prepared to report:

1. Date and time;
2. Name, address, and phone number of the pesticide applicator;
3. Name, address, and phone number of the pesticide business (if any);
4. Name and phone number of the property owner or operator;
5. Location of the incident;
6. Name and EPA registration number of the pesticide(s);
7. Estimated amount and dilution rate of pesticide(s) involved; and
8. Corrective action(s) taken.

State-Specific Pesticide Spill Reporting Contacts

In the event of a fire, explosion, or other emergency pesticide release that could threaten human health, or if you know that a spill has reached surface water, call the National Response Center's 24-hour number: 1-800-424-8802. **Some states may impose additional reporting requirements**; refer to the information below for details. Check with your state pesticide regulatory agency to verify if there are additional requirements.

- In **Delaware**, emergency pesticide spills and releases should be reported to the Delaware Department of Natural Resources and Environmental Control Emergency Response Branch by calling: 1-800-662-8802.

- In **Maryland**, emergency pesticide spills and releases should be reported to the Maryland Department of the Environment by calling: 1-866-633-4686.

- **New Jersey** licensed dealers, dealer businesses, commercial pesticide operators, applicators, or applicator businesses, must immediately notify the New Jersey Department of Environmental Protection (NJDEP) of any "reportable" pesticide spills occurring under their direct supervision or direct observation by calling: (877) 927-6337. New Jersey **reportable spills of pesticides include**:
    - Outside a structure - more than 1 pound active ingredient.

- Inside a structure - more than 1 pound active ingredient of dry pesticide or 1 gallon of liquid (pesticide and/or diluent).
- Indoor spill of termiticide - more than 50 in^2 of organochlorine termiticide contamination at one injection point, or greater than 1 yd^2 aggregate contaminated by organochlorine termiticide along an interior wall base, and/or when a heating duct/system is contaminated.

Within ten days of the spill, a written report must be submitted to the NJDEP Pesticide Control Program, P.O. Box 411, Trenton, NJ 08625-0411, outlining the eight elements listed. You may download a template "Spill Report Card" from the Rutgers Pesticide Safety Education Program at *https://pestmanagement.rutgers.edu/pat/record-forms-2-2/*.

- In **Pennsylvania**, emergency pesticide spills and releases should be reported to the Pennsylvania Department of Environmental Protection (DEP) by calling: 1-800-541-2050. If the waters of the Commonwealth are threatened, the DEP must be notified immediately by calling: (717) 783-2300. Additional contact information and emergency phone numbers for pesticide related spills and accidents is available at *https://extension.psu.edu/emergency-phone-numbers-for-pesticide-spills*.

- **Virginia** pesticide regulations (2VAC5-685-170) require reporting to the Virginia Department of Agriculture and Consumer Services (VDACS) when there is a threat to any person, to public health or safety, or to the environment as a result of the use or presence of any pesticide. Spills must be reported to VDACS within 48 hours by calling: (804) 371-6560. Within ten days of the spill, a written report must be submitted to Field Operations, Virginia Department of Agriculture and Consumer Service Office of Pesticide Services, P.O. Box 1163, Richmond, VA 23218, outlining the eight elements listed. In the event of an emergency release which would impact other individuals or other property, notify the Virginia Department of Environmental Quality by calling: 1-800-468-8892.

- In **West Virginia**, emergency pesticide spills and releases should be reported to the West Virginia Department of Environmental Protection by calling: 1-800-642-3074.

5. Reducing Risks to Handlers and Workers

5.1. EPA's Worker Protection Standard

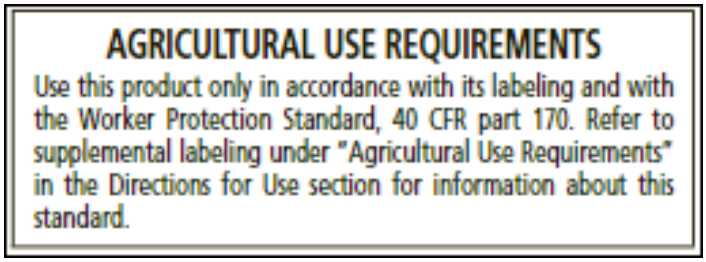
EPA's Federal Worker Protection Standard (CFR Title 40, Part 170) establishes specific safety requirements for **pesticide handlers** and general **agricultural workers**. EPA defines these groups as follows:

"**Handlers**" are individuals employed by an agricultural establishment or commercial pesticide application company who mix, load, transfer, or apply pesticides; handle opened pesticide containers; act as flaggers during an application; clean, maintain, or repair application equipment; assist with pesticide application; enter a treated greenhouse or enclosed area after pesticide application; perform tasks as a crop advisor; or dispose of pesticides or their containers. The WPS mandates that handlers, except for immediate family members, **be at least 18 years old**. Some state labor laws are more restrictive, prohibiting minors under 18 years old from working as pesticide applicators or entering areas where pesticides are applied.

"Agricultural Workers" are individuals employed by an agricultural establishment to perform tasks such as carrying nursery stock, repotting plants, harvesting, weeding, watering or other tasks directly related to the production of agricultural plants on a farm, forest, nursery, or greenhouse.

WPS regulations apply to any agricultural establishment that employs pesticide handlers or agricultural workers where EPA-registered pesticides are used in the production of agricultural commodities. The WPS also applies to custom pesticide applicators and labor contractors who supply workers or independent crop consultants hired by these establishments.

Only "WPS-labeled" pesticides may be used in agricultural production. These products are identified by a box on the label titled "Agricultural Use Requirements." The first paragraph in this box mandates compliance with WPS regulations. Specifically, it reads: "Use this product only in accordance with labeling and with the Worker Protection Standard 40 CFR part 170. The Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to statements on the label about personal protective equipment and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered under the Worker Protection Standard…"


AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

The following provides a brief overview of these regulations. Additional compliance resources and further information can be found at the end of this section. The WPS reduces the risks of occupational illness and injury from pesticide exposure in three ways:

1. **Inform** workers and handlers about potential pesticide exposures;
2. **Protect** workers, handlers, and others from pesticide exposure; and
3. **Mitigate** any pesticide exposures that workers or handlers may experience.

Inform:

To ensure employees are aware of pesticide exposure risks, employers must provide specific information to farmworkers. This includes **annual pesticide safety training for both pesticide handlers and agricultural workers**. Workers must be trained before entering any area where pesticides have been applied or where a REI has been in effect in the past 30 days. Training content is freely available at *https://www.pesticideresources.org/wps/*. Trainers must be certified applicators, designated as qualified trainers by EPA or their state pesticide regulatory agency, or have completed an EPA-approved "*Train the Trainer*" course. Approved trainers must use current EPA-approved training materials. Employers are required by federal regulations to **retain WPS training records for two years**. **Some states may have stricter requirements**. For example, New Jersey Worker Protection regulations (NJAC 7:30, Subchapter 12; *https://dep.nj.gov/pesticides/regulations/*) require that worker and handler training records be maintained for three years, both by agricultural employers and trainers.

Agricultural employers must provide workers and handlers access to SDSs and labeling of any pesticide product used on the establishment. Employers must maintain pesticide application records and SDSs for two years and be able to provide access or copies to workers, handlers, treating medical personnel, or a "designated representative."

Other information requirements include displaying WPS-required pesticide safety information at a central location and at certain decontamination sites. This safety information may be posted in any format, such as a poster that meets the WPS requirements (see "Federal Compliance Assistance" at the end of this section). **The WPS also requires that the following pesticide application information be displayed in a central location:**

1. Pesticide product name, EPA registration number, and active ingredient(s);
2. Crop or site treated, including location and description of the treated area;
3. Date(s) and times of pesticide application (start and end); and
4. Duration of REI.

This information must be posted before workers enter treated fields or at the beginning of the next workday, whichever occurs first, and must remain posted for 30 days after the REI expires. **State regulations may impose different requirements for the display and retention of pesticide application information; where these are more restrictive, they take precedence over federal requirements.** Note that New Jersey has additional display requirements, including posting a map of the farm to indicate treated areas.

Protect:

All WPS-labeled pesticide products must include a specified REI, which can range from 0 to 48 hours or longer. Always check the pesticide label for the applicable REI. Some products have a uniform REI for all crops and uses, while others may vary by crop or application method. When multiple pesticides with different REIs are applied at the same time, the longest interval must be followed.

To protect farmworkers, employers must **post warning signs** (*see left*) around treated areas when the REI exceeds 48 hours for outdoor applications, or 4 hours for indoor applications. If the REI is 48 hours or less outdoors, or 4 hours or less indoors, employers may choose to either post warning signs or provide oral notification, unless the pesticide labeling requires both.

Employers must also provide PPE and decontamination supplies to pesticide handlers and early entry workers, as specified on the pesticide label (refer to section D 5.2). The PPE provided must be clean and in proper working condition.

Workers may only enter treated areas before the REI expires under limited circumstances. Early entry is permitted for short-term, non-hand labor tasks under one hour, emergency agricultural situations, or specific tasks approved by the EPA through formal exception.

Employers must also prevent unprotected workers and the public from being exposed during pesticide applications. The WPS includes requirements for restricting access around application equipment during an outdoor pesticide application. This area, referred to as the **Application Exclusion Zone (AEZ),** moves with the equipment and may extend beyond the agricultural establishment. Under the AEZ requirements, pesticide handlers must temporarily suspend applications if any individuals are within this zone (whether on or off the establishment) and may not resume until the area is clear. Employers must ensure that only trained and equipped handlers enter the AEZ within the establishment's boundaries. Depending on application type and droplet size, the AEZ may extend 25 to 100 feet from the equipment; for additional guidance see *https://www.epa.gov/pesticide-worker-safety/worker-protection-standard-application-exclusion-zone*.

Mitigate:

To reduce the impact of pesticide exposure, employers must provide decontamination sites and emergency assistance. Emergency eye-flushing supplies must be available at all pesticide mixing and loading sites when products requiring eye protection are used. Decontamination sites must include an adequate supply of water, soap, and towels for both routine washing and emergency use. Employers must also provide emergency assistance, including transportation to a medical care facility in the event of a pesticide-related injury, and must supply medical personnel with information about the pesticide(s) involved.

Immediate Family Exemptions

The WPS defines immediate family to include spouses, parents, stepparents, foster parents, in-laws, children, stepchildren, foster children, sons- and daughters-in-law, grandparents, grandchildren, siblings, brothers- and sisters-in-law, aunts, uncles, nieces, nephews, and first cousins. Owners of agricultural establishments and their immediate family members are exempt from many WPS requirements. However, **if only immediate family members work on the agricultural establishment, the owner must still comply with the following WPS requirements**:

1. Ensure pesticides are used according to label directions;
2. Use all PPE listed on the pesticide labeling;
3. Follow WPS requirements for respirator training, medical evaluation, fit testing, and recordkeeping when respirators are required by the pesticide label (refer to section D 5.2.2 for details);
4. Ensure pesticides do not contact anyone;
5. Suspend pesticide applications if anyone enters the AEZ; and
6. Keep individuals out of treated areas until the REI expires.

Federal Compliance Assistance

EPA in collaboration with the **Pesticide Educational Resources Collaborative (PERC)** provides resources to help agricultural employers comply with WPS regulations**.** Key resources available on the PERC website (*https://www.pesticideresources.org/)* include:

- Quick Reference Guide to the WPS; see *https://www.pesticideresources.org/wps-resources/quick-reference-guide/*. This one-page, double-sided chart summarizes WPS requirements.
- "How to Comply With the 2015 Revised Worker Protection Standard For Agricultural Pesticides" manual; see *https://www.pesticideresources.org/wps-resources/how-to-comply-with-the-2015-revised-worker-protection-standard-for-agricultural-pesticides-what-owners-and-employers-need-to-know/*.
  This manual assists agricultural employers in complying with the requirements of the WPS.
- "Worker Protection Standard Frequently Asked Questions, 40 CFR Part 170" guide; see *https://www.epa.gov/sites/default/files/2016-04/documents/wps-faq.pdf*.

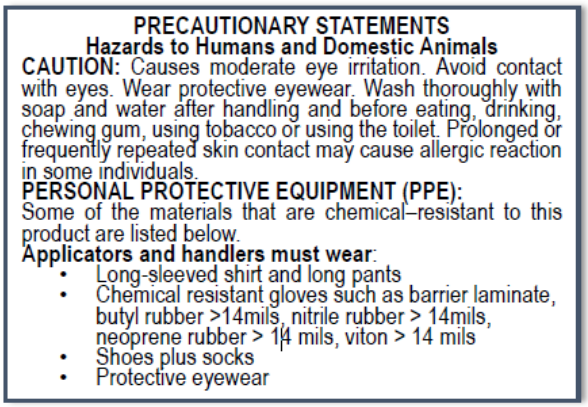
The WPS requires that pesticide safety information be accessible to workers at any time during normal work hours. Although no specific format is required, PERC has developed an updated *"WPS Safety Poster*" for central posting areas and certain decontamination sites. Posters are available in multiple languages including English, Spanish, Russian, Ilocano, Tagalog, Karen, Haitian-Creole, and Vietnamese, and can be downloaded at *https://www.pesticideresources.org/wps-resources/updated-wps-posters-for-central-posting-areas-and-certain-decontamination-sites/*, or may be purchased from the National Pesticide Safety Education Center (NPSEC) online store at *https://npsecstore.com/collections/posters*. PERC also maintains email distribution lists to notify interested parties about new publications. Agricultural employers may subscribe at *http://pesticideresources.org//lists.html*. PERC collaborates with NPSEC as its distributor for other printed resources and posters, which are available for purchase at *https://npsecstore.com/*.

Refer to your state pesticide regulatory agency for state-specific regulations and policy related to the WPS. When state regulations are more restrictive than federal standards, the state regulations take precedence. Contact your state pesticide regulatory agency or state Cooperative Extension Pesticide Safety Education Program to learn about available WPS training and outreach opportunities.

5.2. Personal Protective Equipment for Pesticides

PPE refers to apparel and devices worn to protect the body from contact with hazardous materials, such as pesticides or pesticide residues. PPE includes coveralls or protective suits, aprons, gloves, footwear, headgear, eyewear, and respirators. Additional details are provided in sections D 5.2.1 and D 5.2.2.

Wearing PPE significantly reduces the potential for skin, eye, oral, and inhalation exposure, thereby lowering the risk of pesticide poisoning or injury. Employers are responsible for providing the necessary safety equipment, as required by the pesticide label, to employees who handle, apply, transport, or otherwise come into contact with pesticides. All PPE must be clean, properly maintained, and in good working condition. Under the WPS, employers of pesticide handlers in agricultural settings are **legally required to provide and train employees in the use of all PPE specified on the label.**



PRECAUTIONARY STATEMENTS
Hazards to Humans and Domestic Animals
CAUTION: Causes moderate eye irritation. Avoid contact with eyes. Wear protective eyewear. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.
PERSONAL PROTECTIVE EQUIPMENT (PPE):
Some of the materials that are chemical–resistant to this product are listed below.
Applicators and handlers must wear:
- Long-sleeved shirt and long pants
- Chemical resistant gloves such as barrier laminate, butyl rubber >14mils, nitrile rubber > 14mils, neoprene rubber > 14 mils, viton > 14 mils
- Shoes plus socks
- Protective eyewear

Selection of PPE

The pesticide label specifies the minimum PPE required for adequate protection during handling or early-entry activities. **Wearing less than the minimum is both illegal and dangerous**. Applicator PPE requirements are typically listed in the "Precautionary Statements" section of the pesticide label (see example in box on the previous page). Additional specific requirements may be included in the "Agricultural Use Requirements" box on the label, such as PPE for early-entry workers.

PPE requirements may vary depending on factors such as the pesticide's toxicity, formulation, dilution, route of exposure, and the task being performed. For example, a single label may list one set of PPE for applicators and another for early-entry agricultural workers who enter treated areas during the REI.

5.2.1 Body Protection for Early Entry Workers and Pesticide Handlers

To be effective, PPE must:

- Prevent pesticides from coming into contact with the body (head, face, neck, trunk, arms, legs, and feet) throughout the pesticide handling activity;
- Be resistant to punctures and tears during normal use; and
- Be comfortable enough to allow free movement, ensuring the wearer will continue to use it.

However, not all protective clothing offers the same level of protection under all conditions. PPE materials perform differently when exposed to various pesticides; some may degrade, showing signs such as swelling, discoloration, softening, brittleness, or texture changes. If degradation is observed, the PPE should be replaced immediately to prevent exposure.

Pesticides can also move through PPE materials by the process of permeation until the chemical "breaks through" to the inside. Some materials block pesticide entry for extended periods, while others allow it to pass through within minutes, directly exposing the skin. Factors such as contact time, pesticide concentration, temperature, and the chemical composition of the product affect the rate of permeation. **Properly selected PPE significantly reduces the risk of pesticide exposure, though it does not eliminate it entirely.**

Work Clothing:

Your work clothes provide a basic barrier to minimize pesticide contact with your skin. **At a minimum, always wear a long-sleeved shirt, long pants, closed-toed shoes, and socks whenever handling pesticides or working around pesticide residues.** Choose tightly woven fabrics that reduce pesticide penetration, and ensure the clothing is free of holes or tears. Fasten shirt collars completely to protect the lower neck. Do not use these clothes for anything other than handling pesticides, and store and launder them separately from other clothing after each day's use.

Coveralls:

Some pesticide labels require the use of coveralls over work clothes. Coveralls can be made of woven fabrics (such as cotton or twill) or nonwoven fabrics and should be durable enough for repeated laundering. Coveralls must be loose-fitting, one- or two-piece garments that cover the entire body, excluding the head, hands, and feet. In some instances, the label may require chemical-resistant coveralls or suits. Chemical-resistant suits are made of nonwoven fabric and are usually sold as one-piece coveralls. If you expect prolonged or heavy pesticide exposure, consider wearing a chemical-resistant suit even if not required by the label. The biggest drawback to chemical-resistant suits is that they may make you uncomfortably warm. Take extra precautions to avoid heat stress if this occurs.

Aprons:

Some labels require the use of a chemical-resistant apron when mixing or loading pesticides or cleaning application equipment. Select aprons that cover the front of the body from the middle of the chest to the knees. If an apron could get caught in machinery or interfere with your work, wear a chemical-resistant suit instead.

Gloves:

Pesticide handlers experience the highest exposure to pesticides on their hands and forearms. Wearing chemical-resistant gloves can reduce this exposure by up to 99 percent (Source: The Farm Family Exposure Study, John Acquavella). Always wear the type of chemical-resistant glove specified on the product label. Choose gloves carefully, as different materials have different chemical resistant properties. Some labels may refer to an EPA

chemical resistance category chart for glove material options. Gloves should be thick enough to prolong breakthrough time, typically 14 millimeters for most materials. **Do not use non-chemical-resistant gloves (*e.g.*, leather or cloth) when handling pesticides** (an exception applies to certain fumigant formulations that may require the use of fabric gloves). In addition, do not use gloves constructed with cotton linings or flocking. These materials cannot be effectively decontaminated and can absorb pesticides, increasing the risk of skin exposure. Check gloves regularly for wear and tear. Replace gloves immediately if they are punctured, torn, or damaged. Wear gloves that fit well to avoid gaps where pesticides can enter, and to ensure comfort and dexterity.

Footwear:
If the label specifies "chemical-resistant footwear," use chemical-resistant shoes, boots, or shoe coverings worn over regular footwear. Do not wear leather or canvas footwear, as these materials absorb pesticides and cannot be decontaminated. Consult the manufacturer or supplier for guidance in selecting chemical-resistant footwear with the durability required for your work. Do not use this footwear for other purposes.

Headgear:
When the label specifies "chemical-resistant headgear," use either a chemical-resistant hat with a wide brim, or a chemical-resistant hood. Hoods attached to chemical-resistant coveralls or suits provide extra protection for the neck and back. Do not use headgear made of absorbent materials such as cotton, leather, or straw as these cannot be decontaminated.

Eye Protection:
Eyes are highly susceptible to pesticide absorption. When the label species that applicators "wear protective eyewear," options may include goggles, face shields, safety glasses with side shields, or a full-face respirator. Choose eyewear based on the task at hand, ensuring it provides adequate protection from splashes or particulate matter. Some labels may be more specific and require that a particular type of eyewear be worn. **If eye protection is required, WPS mandates that handlers have immediate access to emergency eyewash supplies**.

Maintenance and Disposal of PPE

All PPE should either be disposable OR easy to clean and durable for repeated use. If using reusable PPE, inspect it regularly and replace it when the inside surface becomes contaminated. Clean reusable PPE thoroughly between uses, even if worn briefly. Pesticide residues on PPE can continue to permeate the material, so replace reusable items regularly, even if they show no visible signs of wear. Wearing contaminated PPE multiple times without proper cleaning can result in a buildup of pesticide residues, which may pose a health risk. **Rinse and discard used PPE according to label instructions and local disposal regulations.**

5.2.2 Respiratory Protection for Pesticide Handlers

Pesticide applicators can be exposed to toxic gases and vapors, particulates, or both. Different pesticide formulations, environments, and application methods may require different types of respiratory protection devices. EPA requires pesticide manufacturers to determine and specify respiratory protection based on anticipated hazards and inhalation risk. Manufacturers provide these requirements on the pesticide label, which are product- and task-specific. **Never assume that products containing the same active ingredient require the same type of respiratory protection. Always read and follow the specific respirator guidance provided on each product's label.**

The pesticide label states whether a respirator is required and, if so, which type. Respirators must be **"NIOSH-approved."** The NIOSH approval certificate accompanying the respirator identifies the approved configuration, level of protection, and any cautions or limitations.

Atmosphere-supplying respirators provide clean air from an uncontaminated source, while air-purifying respirators remove contaminants from the surrounding air. Both types may have tight- or loose-fitting facepieces. Fit testing is required for respirators with tight-fitting facepieces to ensure the correct size, model, and manufacturer are selected.

When air-purifying respirators are required, the label specifies the type of particulate filter and/or chemical cartridge or canister needed. Particulate filters remove liquid aerosols and dusts from the air and differ in oil resistance. When a pesticide contains oil or an oil-like substance, an N-series (not oil proof) cannot be used; the label will specify an R-series (oil-resistant) or P-series (oil-proof) filter. Powered air-purifying respirators (PAPRs)

use a single type of high efficiency (HE) particulate filter. EPA regulations [40 CFR 170.507(d)] require replacing particulate filters when damaged, torn, soiled, or when breathing becomes difficult. Filters must also be replaced according to the respirator manufacturer's recommendations or pesticide labeling, whichever occurs first.

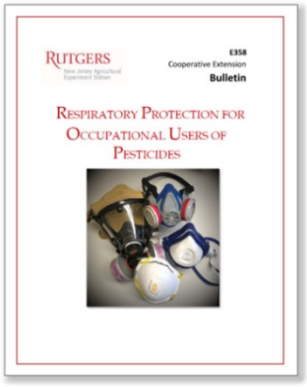
The most common chemical cartridge or canister used for pesticide applications is an organic vapor (OV) cartridge or canister, which contains activated carbon that absorbs organic vapor molecules from the air. A chemical cartridge or canister is effective until the sorbent bed is saturated and breakthrough occurs (*i.e.*, when contaminants penetrate through to the inside of the facepiece). Any taste, smell, or irritation inside the facepiece indicates possible breakthrough. If this occurs exit the area immediately. Like filters, cartridges or canisters should be replaced according to the respirator manufacturer's recommendations or pesticide labeling, whichever occurs first. Replace cartridges or canisters sooner if odor, taste, or irritation is detected inside the facepiece.

Before respirator use, users must undergo a **medical evaluation** to ensure they can safely wear the respirator under expected conditions. When a pesticide label requires respirator use, employers must provide pesticide handlers a medical evaluation per OSHA 29 CFR 1910.134(e).

A **fit test** must be conducted before a respirator is first used and at least annually thereafter per OSHA 29 CFR 1910.134(f). The fit test ensures that the selected make, model, style, and size of respirator properly seals to the user's face. Fit testing must also be repeated whenever a different respirator is used or if facial changes (such as weight fluctuation, dental work, or scarring) could affect the fit.

Employers must provide effective **annual respirator training** per OSHA 29 CFR 1910.134(k) for any employee required by the pesticide label to wear respiratory protection. Users must know how to inspect the respirator, understand its capabilities and limitations, recognize danger signals during use, and how to properly put it on and remove it.

Proper care, maintenance, and storage after use help prolong respirator life. **Contact your state Cooperative Extension Pesticide Safety Education Program for questions about PPE.**



Consult Rutgers Bulletin E0358 "*Respiratory Protection for Occupational Users of Pesticides*" for detailed guidance on the different types of respirators, their limitations, use, care, maintenance, and storage, as well as requirements for medical evaluations, fit testing, and training. The bulletin also outlines EPA and OSHA regulatory requirements that apply to commercial users and agricultural operations using pesticides.

- The publication may be downloaded for free at *https://njaes.rutgers.edu/pubs/publication.php?pid=E358*.
- Hardcopies are available at the NPSEC online store at *https://npsecstore.com/collections/respiratory-guides*.

6. Protection of the Environment

To minimize environmental contamination and protect non-target organisms, always read and follow the pesticide label before use. The "Environmental Hazards" section provides important information on potential impacts to surface and groundwater, non-target species, and endangered species protection requirements. Avoid using excessive amounts of pesticides by calibrating your sprayer to ensure application rates remain within label specifications. Select appropriate application methods, droplet sizes, nozzle types, and tank mix partners to reduce off-target drift.

6.1 Minimize Off-Target Drift

During application, pesticides may move away from intended target areas, a process known as drift. **Drift refers to the movement of pesticide particles or vapors off target**. Pesticide drift reduces application effectiveness and can expose wildlife, vegetation, people, and property to unintended pesticide contact.

- **Particle drift** occurs when dry pesticide particles or liquid spray droplets move off target during or soon after application. The primary factors influencing particle drift are wind speed, boom height, distance from susceptible vegetation, and particle size.

- **Vapor drift** results from pesticide volatilization into gas or fumes. It is more likely with pesticides that have high vapor pressure or during applications when ambient air temperature is high. Labels for volatile products may specify a temperature limit for application or require soil incorporation to prevent vapor movement.

Labels include mandatory drift management requirements and advisory statements identifying best practices for droplet size, nozzle selection, application methods, and tank mixes. Before and during application, assess weather conditions. Use a wind gauge and **avoid spraying when wind speeds exceed 10 mph**. Drift potential is lowest when wind speeds range from 3 to 6 mph and blow away from sensitive sites. **Avoid spraying during dead calm conditions (no air movement)**, which can signal temperature inversions that cause long-distance drift. Maintain boom heights as low as practical within manufacturer guidelines; the shorter the droplet travel distance, the lower the drift risk.

To reduce pesticide drift and improve application accuracy:

- Select low- or non-volatile pesticides.
- Apply under suitable weather conditions. Avoid spraying in high winds, high temperatures, low humidity, or temperature inversion conditions. Spray when soil temperatures are coolest and relative humidity is highest.
- Use the lowest spray pressure and largest droplet size that still provides adequate coverage and control.
- Avoid nozzles or configurations that produce fine droplets; consider using "low drift" nozzles.
- Adjust the boom to the lowest practical height that provides complete and consistent spray coverage.
- Use lower travel speeds.
- Use drift control additives when allowed by the pesticide label.

Sample Drift Mitigation Label Language:

Controlling Droplet Size. *The most effective way to reduce drift potential is to apply the largest droplets that provide sufficient coverage and control.*
Volume. *Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.*
Pressure. *DO NOT exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.*

6.2 Protection of Surface and Ground Water

Pesticides can be transported from the atmosphere to streams and ground water through rainfall or by the deposition of particles from off-target drift. Streams are particularly vulnerable to pesticide contamination because runoff from agricultural and urban areas carries both dissolved and sediment-bound pesticides directly into waterways. The timing of pesticide application relative to rainfall largely determines how much pesticide reaches surface water and ultimately groundwater.

Pesticides enter groundwater primarily through recharge from rainfall or irrigation in agricultural and urban areas. Other important local sources include leaky well casings and contaminated streams that lose water to the groundwater system. Groundwater can also contribute significantly to streamflow during low-flow periods and, if contaminated, can serve as a source of pesticides to surface waters.

Factors That Affect Movement of Water and Contaminants

The depth of aquifers and the types of soils above them influence how much surface water and contaminates reach the aquifer and how quickly this occurs. Thus, shallow water tables tend to be more vulnerable to contamination than deeper ones. Soils with high clay or organic matter content retain water longer and slow its downward movement, while sandy soils allow water to move more rapidly. High clay and organic matter content also provide more surface area for binding contaminants, reducing leaching potential. Because fine-textured soils have smaller pore spaces than coarse soils, they further limit the infiltration of water and contaminants.

Pesticide Characteristics

The chemical properties of a pesticide determine whether it remains attached to soil or sediment, dissolves and is transported in runoff, or leaches into groundwater. The most important characteristics influencing these behaviors are water solubility, soil adsorption, and persistence in the environment.

Pesticides that are highly soluble in water have a greater potential to contaminate groundwater than those that are less soluble. The water solubility of a chemical, measured in parts per million (ppm), indicates how much of it can dissolve in water. Chemicals with a solubility greater than 30 ppm are more likely to leach into groundwater. A pesticide's ability to adhere to soil particles also affects its movement; those with strong soil adsorption are less likely to reach the aquifer. Adsorption depends largely on soil organic matter content, as soils rich in organic matter retain pesticides more effectively than soils with low organic content.

Persistence, or the length of time a chemical remains in the environment before degrading, also affects a pesticide's likelihood of reaching groundwater. Persistence is measured by half-life, or the time required for half of the chemical to break down. Data from the United States Geological Survey's National Water-Quality Assessment (NAWQA) show that pesticides with greater soil persistence are more frequently detected in groundwater than those that degrade more quickly. Pesticides are less likely to leach when their half-life in water is less than six months, and their soil half-life is less than three weeks.

Degradation rates vary widely depending on chemical structure and environmental conditions, with half-lives ranging from hours to decades. Persistent pesticides or their degradants can accumulate in soils, sediments, or living organisms and be transported over long distances. Historically used organochlorine pesticides such as DDT have shown both long-distance transport and environmental accumulation.

How to Protect Water Sources

To minimize the risk of pesticide contamination in water sources, use the following best management practices:

- **Apply pesticides only when needed.** Unnecessary pesticide use increases the risk of contamination. Avoid irrigating immediately after a pesticide application unless required by the product label, as excess soil moisture can speed pesticide movement into groundwater.
- **Examine the chemical properties of the pesticides that you use.** Pesticides that are highly soluble in water, weakly adsorbed to soil, or persistent pose a greater risk of leaching into groundwater. Consider selecting products that are less soluble, more strongly adsorbed to soil, or degrade more quickly. To compare the leachability of different pesticides, refer to the OSU Extension Pesticide Properties Database at *https://npic.orst.edu/ingred/ppdmove.htm*. This resource provides a qualitative "Pesticide Movement Rating" (low, moderate, high) along with key parameters such as soil half-life (days), water solubility (mg/l), and the sorption coefficient (soil Koc, which indicates how strongly a chemical binds to soil organic matter).
- **Understand your local soil and geologic conditions.** Areas with shallow water tables, sandy soils, or low organic matter are more susceptible to groundwater contamination. In these areas, choose pesticides with low water solubility and short persistence.
- **Evaluate your management practices.** Using the same pesticide repeatedly over multiple seasons can lead to its accumulation in the soil and increase the risk of groundwater contamination.
- **Consider the timing and method of pesticide applications.** Applying pesticides during periods of heavy rainfall or irrigation increases the likelihood of leaching. Early-season applications may pose a greater risk when water tables are high. Application methods such as direct injection, incorporation, and chemigation may also increase contamination risk; always follow label directions carefully.
- **Locate and protect wells.** The ground surrounding a wellhead should slope away from the well to divert runoff. Pesticide storage and mixing areas should be located at least 50 feet from any well used for drinking water or irrigation.
- **Inspect wells near pesticide storage or mixing sites regularly.** The National Ground Water Association recommends annual maintenance checks to ensure proper function and water quality. Ensure well covers and caps are secure, in good condition, and have intact seals. Replace cracked or damaged casings promptly to prevent direct contamination pathways.
- **Install anti-backflow devices on system used for chemigation or sprayer filling.** These devices prevent pesticides from entering the water supply in the event of pump failure or backflow. Many state pesticide regulations require that hoses, pumps, or other equipment used to transfer water into pesticide handling or

application systems have effective backflow prevention devices, or that an adequate "air gap" be maintained between the water source and the pesticide mixture.

- **Maintain all application equipment properly.** Malfunctioning equipment can result in overapplication and increase groundwater contamination risk. Inspect sprayers and chemigation systems before each season to confirm that all parts, pumps, and lines are functioning properly and free of clogs or leaks. Calibrate equipment at the start of the season, periodically during use, and after any adjustments to ensure accurate pesticide delivery.

6.3. Protection of Non-Target Organisms

Pesticide labels must include warnings and instructions to protect non-target organisms in the "Environmental Hazards" section. These instructions are based on ecological risk assessments and outline precautions or restrictions to safeguard non-target animals, including birds, mammals, fish, aquatic insects, and bees.

6.3.1 Protection of Pollinators

Pollinators are vulnerable to many chemicals used to control insects, plant pathogens, and weeds. **Pesticides applied during bloom can be toxic to pollinators**, including honeybees and wild bees. This includes foliar applications when flowering crops or weeds are present in or near the treatment area, as well as applications to corn during pollen shed. Systemic seed treatments may also result in pesticide residues in nectar and pollen, though these residue are generally lower than those from foliar applications.

Pollinator Protection and Advisories

If a pesticide used outdoors as a foliar application is toxic to pollinating insects, a "bee hazard" warning is typically required in the "Environmental Hazards" section of the label. Pesticide applicators must take measures to minimize the risk of pollinators contacting a "bee-toxic" pesticide. **"Bee-toxic" pesticides** are those identified on the label as highly or moderately toxic to bees and include precautionary statements for pollinator protection (see box to the right).

Example Label Precautionary Statement for Bee Toxic Pesticides

"…This product is highly toxic to bees and other pollinating insects exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees or other pollinating insects are visiting the treatment area…."

Whenever pesticides are applied, select products that provide effective pest control while posing the least risk to pollinators (see Chapter F, "Insect Control" tables in this guide). Do not apply insecticides during bloom unless they are non-toxic to pollinators, and avoid applying any pesticide while pollinators are actively foraging in the crop, or in adjacent flowering crops or weeds. Applications of bee-toxic pesticides should not occur until flowering is complete or petal fall has occurred, unless precautions are taken to minimize exposure to foraging bees and their hives. Such precautions may include making applications after sunset when temperatures are below 55˚F and notifying local beekeepers in advance.

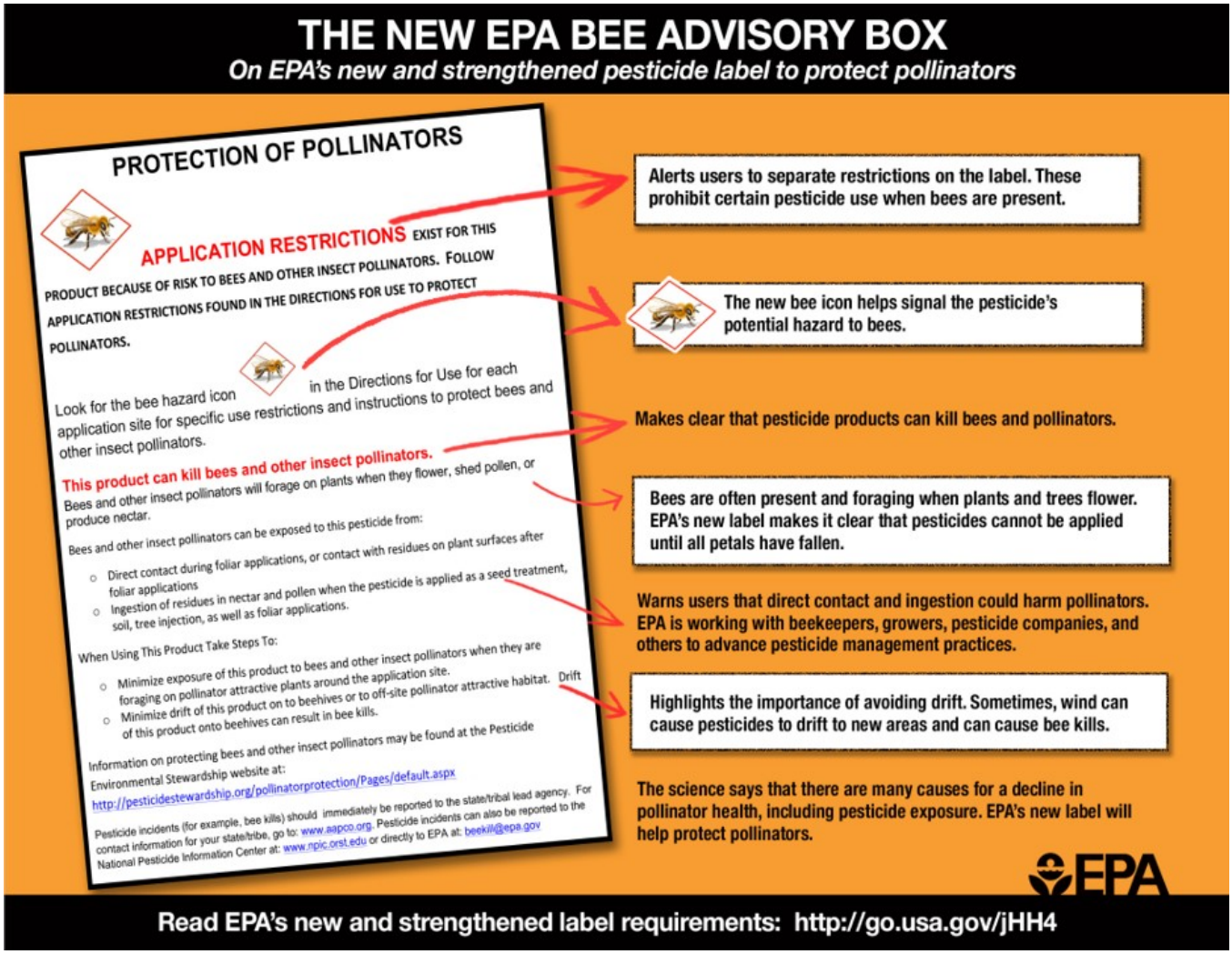
Notifying beekeepers allows them to move, cover, or otherwise protect their hives before spraying, protecting a valuable agricultural resource and reducing the risk of conflicts or legal disputes. Some states, such as New Jersey, have mandatory beekeeper notification regulations. Many other Mid-Atlantic states have Pollinator Protection Plans that include recommendations for communication between beekeepers and agricultural operations. For details on state-specific pollinator protection plans and how applicators can register for FieldWatch®, an online mapping tool that facilitates communications between growers and beekeepers, see later in this section. Also see chapter A.12, "Pollination," in this guide for more information on pollinators.

Many fungicides can interact with insecticides, sometimes increasing their toxicity to bees. Certain combinations can harm both adult and larval honey bees as well as some wild bees, and some fungicides used alone may also negatively impact pollinators. Avoid applying fungicides to flowering crops when bees are present.

In some cases, EPA requires product-specific pollinator protection labeling to safeguard non-target organisms such as bees. Due to growing concerns about pollinator health, EPA now requires manufacturers of neonicotinoid

insecticides (*e.g.*, clothianidin, dinotefuran, imidacloprid, thiamethoxam) to include a "Bee Advisory Box" (Figure 1.1) and mandatory "Directions for Use" (Figure 1.2) on their labels. Both statements are marked with a bee icon and include clear restrictions such as "Do not apply this product while bees are foraging" and "Do not apply until flowering is complete and all petals have fallen."

Figure 1.1 EPA Bee Advisory Box for Neonicotinoid Pesticides
Sample bee advisory box with "bee icons" and advisory language alerting pesticide applicators of additional restrictions for pollinator protection listed on the label.

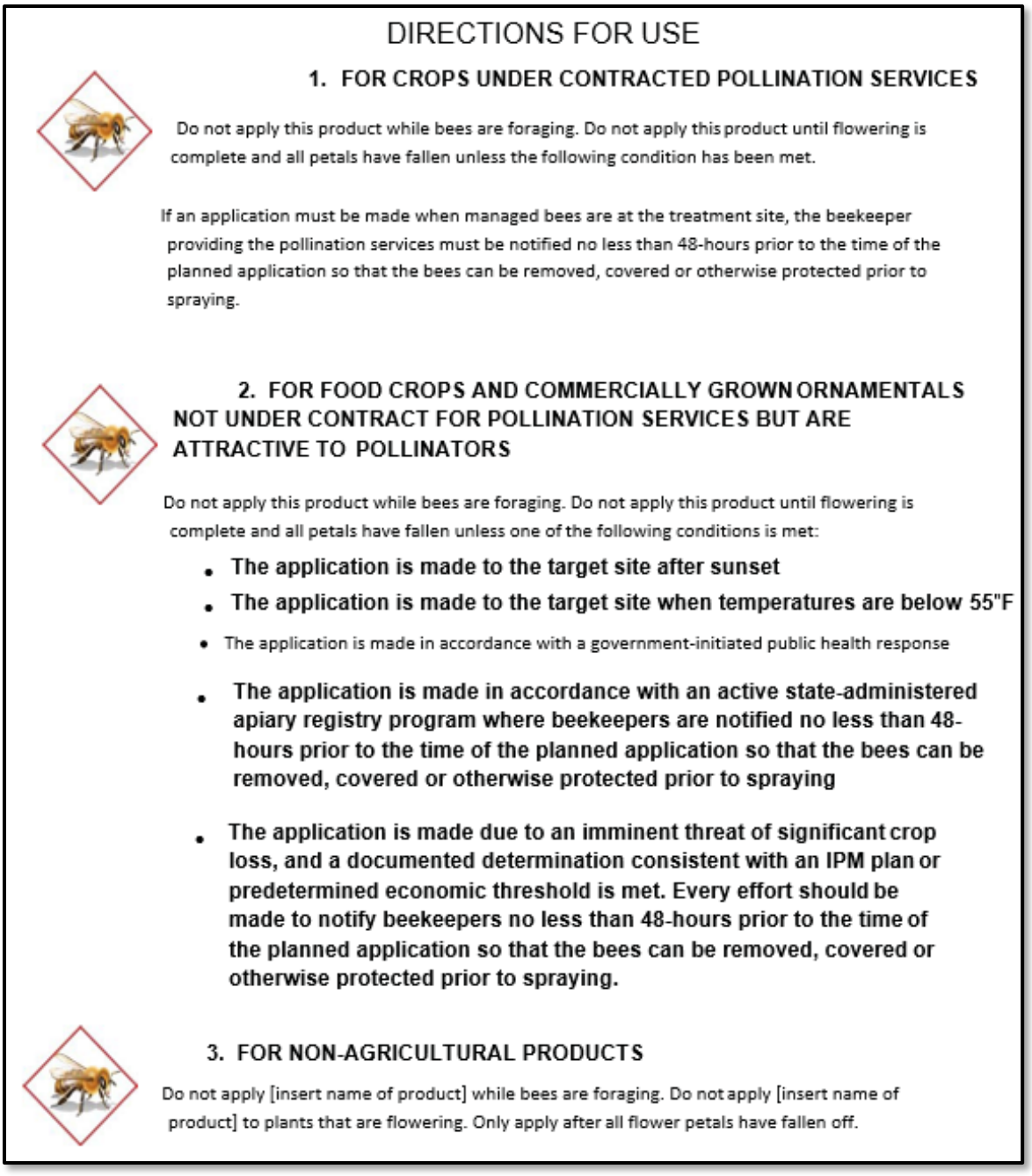


Mandatory pollinator protection language in the "Directions for Use" outlines specific use precautions for:

- Contracted pollination services;
- Food crops and commercially grown ornamentals attractive to pollinators without contracted pollination services; and
- Non-agricultural products.

These precautions may include restrictions on application timing, methods, and environmental conditions to reduce exposure to foraging bees. Applicators must adhere to buffer zones, avoid treatment during active foraging periods, and follow any required notification protocols. These requirements must be followed when using any pesticide identified as toxic to bees.

Figure 1.2 EPA Pesticide Label "Directions for Use" Excerpt for Neonicotinoid Pesticides
An example of the mandatory label language currently required on neonicotinoid products.



DIRECTIONS FOR USE

1. FOR CROPS UNDER CONTRACTED POLLINATION SERVICES

Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless the following condition has been met.

If an application must be made when managed bees are at the treatment site, the beekeeper providing the pollination services must be notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

2. FOR FOOD CROPS AND COMMERCIALLY GROWN ORNAMENTALS NOT UNDER CONTRACT FOR POLLINATION SERVICES BUT ARE ATTRACTIVE TO POLLINATORS

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 is met:

- **The application is made to the target site after sunset**
- **The application is made to the target site when temperatures are below 55"F**
- The application is made in accordance with a government-initiated public health response
- **The application is made in accordance with an active state-administered apiary registry program where beekeepers are notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying**
- **The application is made due to an imminent threat of significant crop loss, and a documented determination consistent with an IPM plan or predetermined economic threshold is met. Every effort should be made to notify beekeepers no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.**

3. FOR NON-AGRICULTURAL PRODUCTS

Do not apply [insert name of product] while bees are foraging. Do not apply [insert name of product] to plants that are flowering. Only apply after all flower petals have fallen off.

State-Specific Pollinator Protection Plans

A state **Managed Pollinator Protection Plan (MP3)** is a voluntary initiative, typically developed by a state's Department of Agriculture to protect managed pollinators such as honeybees from pesticide risks. These programs promote communication among beekeepers, growers, pesticide applicators, and landowners to encourage best practices, reduce pesticide exposure, and support pollinator habitat development. MP3s focus on minimizing risks to managed pollinators through cooperation and education rather than restricting pesticide use. Consult your State Apiarist (see chapter A.12 "Pollination," Table A-6 State Apiarist Contact Information) or your state Department of Agriculture for specific information about your state's pollinator protection requirements.

D. Pesticide Safety

- The **Delaware** Department of Agriculture's MP3 is available at *https://agriculture.delaware.gov/pesticide-management/pollinator-protection-plan/*.

- The **Maryland** Department of Agriculture's MP3 is available at *https://mda.maryland.gov/plants-pests/Pages/pollinator_protection_plan.aspx*. In addition to the MP3, the Maryland Pollinator Protection Act of 2016 was passed to further support pollinator health by restricting the sale and outdoor use of certain neonicotinoid insecticides. The law, effective January 1, 2018, limits outdoor application of neonicotinoids only to farmers and certified pesticide applicators (or people working under their supervision). More information is available at *https://mda.maryland.gov/plants-pests/Documents/PollinatorProtectionActFactSheet.pdf*.

- **New Jersey** does not have a MP3. However, the NJDEP enforces Beekeeper Notification Regulations under NJAC 7:30-9.11. Beekeepers who manage apiaries in the state may voluntarily register their beehives with the NJDEP. A list of registered beekeepers is available on the NJDEP's Beekeeper Notification webpage at *https://dep.nj.gov/pesticides/licensing-registration-and-permitting/beekeeper-notification-registration/*. **Pesticide applicators are required to notify all registered beekeepers within a 3-mile radius at least 24 hours before applying any pesticide labeled as toxic to bees.** Once notified, it is the beekeeper's responsibility to protect their hives.

  Beekeeper notification is mandatory for all crops listed under NJAC 7:30-9.11(i), either during the dates specified below or when the crop is in the flowering stage. The "flowering stage" refers to the period when plants display any part of a blossom involved in pollen or nectar production. Agricultural applications in New Jersey are exempt from the notification requirements unless specifically listed as follows:
  - Apples, pears, strawberries, peaches, and blueberries: April 15th to May 15th
  - Holly: June 1st to June 30th
  - Cranberries: June 15th to August 15th
  - Vine crops (cucurbits): June 1st to August 31st
  - Sweet corn: During flowering stage
  - Cover crop or weeds: During flowering stage

  Notification must include the intended date and approximate time of application, the application location, the pesticide's brand name and active ingredients, and the name and license number of the pesticide applicator. Notification can be made in person, by phone, fax, email, or regular or certified mail (provided it is received 24 hours before the application). Detailed regulations are available at *https://www.nj.gov/dep/enforcement/pcp/regulations/Subchapter%209%20Changes%20in%20Red%202020.pdf*.

  Important

  When using neonicotinoid pesticides, EPA requires a more restrictive beekeeper notification period of 48 hours, compared to New Jersey's 24-hour requirement. Therefore, **pesticide applicators in New Jersey must provide at least 48 hours' notice to beekeepers**, as specified on neonicotinoid product labels.

  New Jersey P.L.2021, c.386 amended the New Jersey Pesticide Control Act to classify neonicotinoid pesticides as "restricted use." The amendment also prohibits the use of neonicotinoids outside agricultural settings. **As of October 31, 2023, neonicotinoid pesticides may be sold only to licensed applicators for agricultural use.** Limited exemptions apply for domestic pet and indoor applications, structural pest control, invasive pest emergencies, and structural "band treatments" that do not involve application to plants.

- The **Pennsylvania** Pollinator Protection Plan (P4) is a living document that outlines best practices for beekeepers, pesticide use, and the development of pollinator forage and habitat. More information is available at *https://pollinators.psu.edu/bee-health/pennsylvania-pollinator-protection-plan-p4*.

- The **Virginia** Department of Agriculture and Consumer Services' MP3 is available at *https://www.vdacs.virginia.gov/plant-industry-services-pollinator-protection-plan.shtml*. The plan outlines best practices for beekeepers, agricultural producers, agricultural commercial applicators, structural pest managers, and the horticultural industry.

- The **West Virginia** Department of Agriculture's MP3 is available at *https://agriculture.wv.gov/wp-content/uploads/WV-Managed-Pollinator-MP3-Final-Draft.pdf*.

For additional information on protecting pollinators, visit the Pesticide Environmental Stewardship website at *https://pesticidestewardship.org/pollinator-protection/*. Details about toxicity of organic pesticides to pollinators and other beneficial insects is available at *https://www.xerces.org/publications/guidelines/organic-pesticides*.

Field Watch

Mid-Atlantic State Departments of Agriculture (Delaware, Maryland, New Jersey, Pennsylvania, Virginia, and West Virginia) have partnered with **FieldWatch®** (*https://fieldwatch.com/*), a non-profit organization that provides free, user-friendly mapping platforms designed to improve communication and environmental stewardship among pesticide applicators, beekeepers, and specialty crop producers. This regional initiative enhances pollinator protection and reduces pesticide drift risks by promoting transparency and coordination across agricultural landscapes.

FieldWatch® operates several registries, including **DriftWatch®** for specialty crop producers and **BeeCheck®** for commercial and hobbyist beekeepers. These platforms allow users to voluntarily map the locations of sensitive crops and managed apiaries, giving pesticide applicators access to site-specific data and contact information to guide responsible application practices. Beekeepers can choose to make their hive locations visible only to registered users, which helps preserve privacy while still contributing to regional stewardship efforts. Specialty crop growers can also mark their fields and purchase signage to increase visibility and awareness among applicators.

Pesticide applicators are encouraged to register with **FieldCheck®** at *https://driftwatch.org/signup#applicator*. FieldCheck® is the viewing portal that consolidates mapped data from DriftWatch® and BeeCheck®. Once registered, applicators can use FieldCheck® to view mapped sites and receive notifications when new hives or fields are added in their designated area, helping them make informed decisions before applying pesticides. This system supports proactive communication and aligns with best management practices recommended by the EPA and state pesticide regulatory agencies. FieldWatch® is not a regulatory tool but a voluntary stewardship resource.

Pesticide Bee Incident Reporting

If you observe or suspect a bee kill incident, especially one potentially linked to pesticide exposure, report it to your state pesticide regulatory agency (*https://npic.orst.edu/reg/state_agencies.html#map*) and to the EPA at *beekill@epa.gov*. These reports help EPA identify patterns of pollinator mortality associated with specific pesticides or active ingredients, which may inform future regulatory actions, label changes, or enforcement decisions.

6.3.2 Protection of Endangered Species

EPA's Endangered Species Protection Program evaluates whether pesticide use may adversely affect threatened or endangered species or their designated critical habitats under the **Endangered Species Act (ESA)**. This includes protections for more than 1,300 federally listed species in the United States. The program's goal is to safeguard these species and habitats while minimizing unnecessary burdens on agriculture and pesticide users. To achieve this, EPA develops pesticide use limitations that promote safe application practices. These limitations are communicated through product labeling. If necessary, **EPA may revise a pesticide's registration, label, or use instructions to ensure compliance with ESA protections**.

When use limitations are needed only in specific geographic areas, EPA issues **Endangered Species Protection Bulletins**. These bulletins provide region-specific and, in some cases, season-specific restrictions to protect listed species and their critical habitats. If a pesticide use limitation applies to a specific region, the "Environmental Hazards" section of the pesticide label will direct users to an Endangered Species Protection Bulletin (see example label on the next page). The label provides two ways to access the bulletin; either by visiting EPA's **Bulletins Live! Two** website at *https://www.epa.gov/endangered-species/bulletins-live-two-view-bulletins;* or by calling EPA's support line: 1-844-447-3813.

Visiting the website is the fastest way to obtain the bulletin. Bulletins Live! Two is EPA's online system for accessing endangered species bulletins. Accessible through a computer or mobile phone browser, the site (see next page) opens to a U.S. map interface where applicators can enter the exact location and intended month of pesticide application.

Example Label

PROTECTING ENDANGERED SPECIES /
PESTICIDE USE LIMITATION AREAS

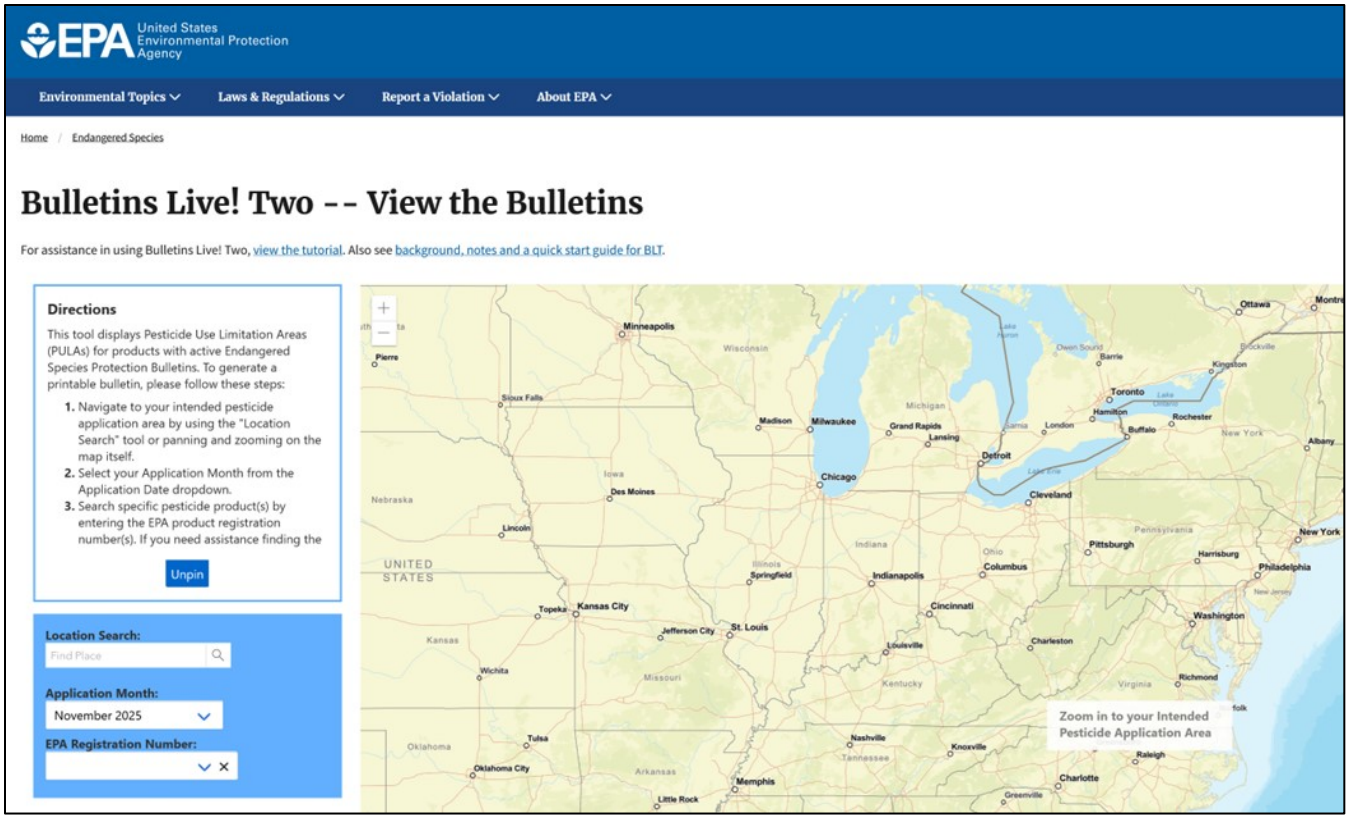
The use of any pesticide in a manner that may kill or otherwise harm an endangered species or adversely modify their habitat is a violation of federal law. Use of this product in a manner inconsistent with its labeling may pose a hazard to endangered or threatened species. When using this product, you must follow the measures contained in the Endangered Species Protection Bulletin for the area in which you are applying the product. To obtain Bulletins, no more than six months before using this product, consult *https://www.epa.gov/endangered-species/bulletins-live-two-view-bulletins* or call 1-844-447-3813.

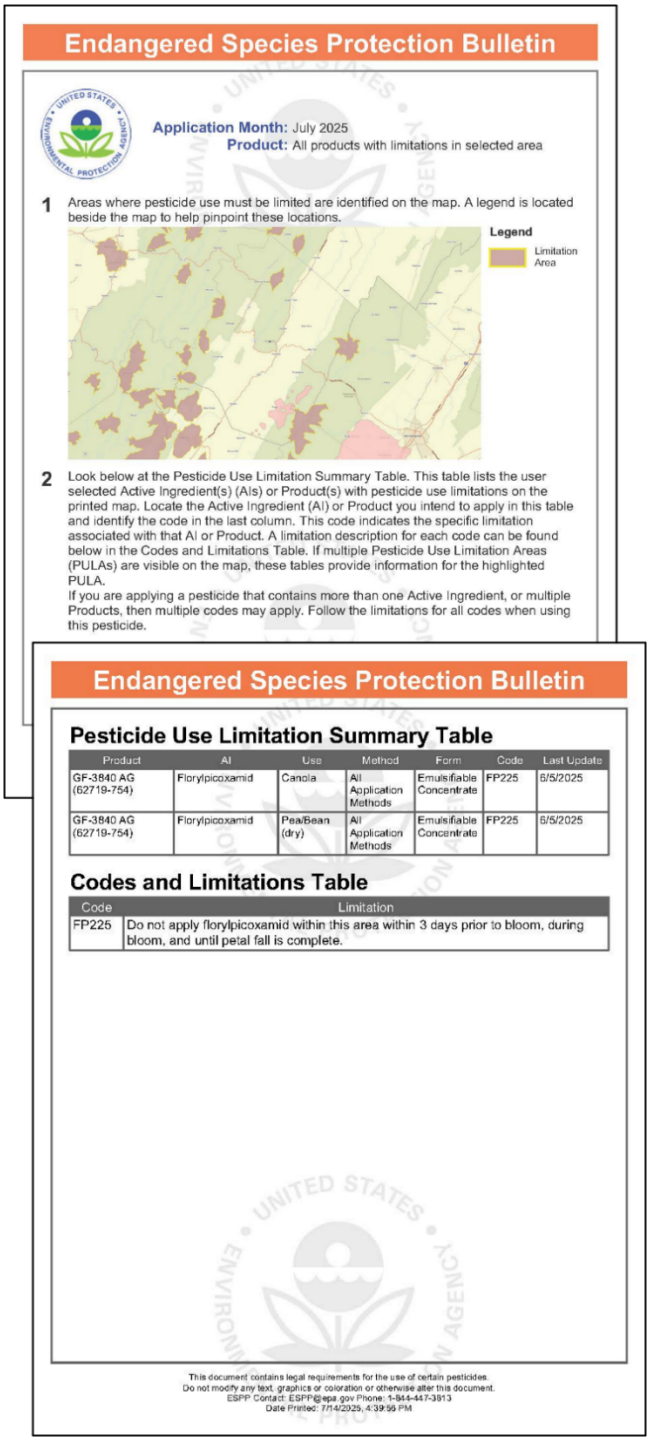
You must use the Bulletin valid for the month in which you will apply the product.

It is a Federal offense to use any pesticide in a manner that results in the death of an endangered species.

To generate an Endangered Species Protection Bulletin, visit EPA's Bulletins Live! Two website and enter the location and month when you plan to apply a pesticide. The application month can be selected up to six months in advance, allowing for proactive planning. The interactive map allows users to manually input or pinpoint the application location. This information allows the system to produce a **Pesticide Use Limitation Area (PULA)** tailored to the specific site and application timing.

Pink-shaded areas on the map indicate zones where additional mitigation measures apply. You may also enter the EPA registration number for a specific pesticide product to narrow your search. Leaving this field blank will display all applicable limitations for registered pesticide products in that area. This flexibility helps applicators identify relevant restrictions whether they are planning for a specific product or reviewing general limitations for their site.





Endangered Species Protection Bulletin

Application Month: July 2025
Product: All products with limitations in selected area

1 Areas where pesticide use must be limited are identified on the map. A legend is located beside the map to help pinpoint these locations.

Legend
Limitation Area

2 Look below at the Pesticide Use Limitation Summary Table. This table lists the user selected Active Ingredient(s) (AIs) or Product(s) with pesticide use limitations on the printed map. Locate the Active Ingredient (AI) or Product you intend to apply in this table and identify the code in the last column. This code indicates the specific limitation associated with that AI or Product. A limitation description for each code can be found below in the Codes and Limitations Table. If multiple Pesticide Use Limitation Areas (PULAs) are visible on the map, these tables provide information for the highlighted PULA.
If you are applying a pesticide that contains more than one Active Ingredient, or multiple Products, then multiple codes may apply. Follow the limitations for all codes when using this pesticide.

Endangered Species Protection Bulletin

Pesticide Use Limitation Summary Table

Product	AI	Use	Method	Form	Code	Last Update
GF-3840 AG (62719-754)	Florylpicoxamid	Canola	All Application Methods	Emulsifiable Concentrate	FP225	5/5/2025
GF-3840 AG (62719-754)	Florylpicoxamid	Pea/Bean (dry)	All Application Methods	Emulsifiable Concentrate	FP225	5/5/2025

Codes and Limitations Table

Code	Limitation
FP225	Do not apply florylpicoxamid within this area within 3 days prior to bloom, during bloom, and until petal fall is complete.

This document contains legal requirements for the use of certain pesticides.
Do not modify any text, graphics or coloration or otherwise alter this document.
ESPP Contact: ESPP@epa.gov Phone: 1-844-447-3813
Date Printed: 7/14/2025, 4:39:56 PM

The bulletin generated will include a "Pesticide Use Limitation Summary Table" (see left for sample two-page Bulletin generated for Pendelton County, West Virginia in July 2025 for a florylpicoxamid containing product with the EPA Registration Number 62719-754). The table outlines essential details about the pesticide product, including product name, active ingredients, uses, application methods, and formulation. Below the summary table, the bulletin provides a "Codes and Limitations Table," which explains the specific use restrictions and required actions to protect federally listed threatened and endangered species and their designated critical habitats.

Compliance with the PULA is mandatory under the ESA. Applicators must follow all listed limitations, which may include restrictions on the timing, location, or method of pesticide application. These measures are designed to minimize the risk of harm to vulnerable species and their ecosystems. Failure to comply with these requirements may result in violations of federal environmental law.

It is essential to retain a copy of the bulletin as documentation of compliance with pesticide label requirements. If there are any changes to the timing or location of the planned application, the user must revisit the Bulletins Live! Two website and generate a new bulletin to reflect those updates.

Federal Compliance Assistance

The Pesticide and Endangered Species Educational Resources Toolbox (*https://www.epa.gov/endangered-species/pesticides-and-endangered-species-educational-resources-toolbox*) is a centralized hub of EPA-developed materials designed to help interested parties understand how pesticide use intersects with endangered species protection. It includes guidance documents, handouts, presentations, webinars, and other resources tailored for users with varying levels of experience. EPA will continue to expand the toolbox with new content as they are developed.

For additional guidance, contact your state pesticide regulatory agency or your state Cooperative Extension Pesticide Safety Education Program.

IMPORTANT:
THE LABEL IS THE LAW!

- When users are directed on a pesticide label to check for Endangered Species Protection Bulletins, the information provided through Bulletins Live! Two constitutes enforceable use limitations.
- **Failure to follow the limitations outlined in the Bulletin is considered misuse of the pesticide and is subject to enforcement under FIFRA.**
- **If such misuse results in a "take" of a federally listed species, the action may also be enforceable under the ESA**.

7. Mid-Atlantic Region Pesticide Program Contacts

Delaware

- **Delaware Department of Agriculture, Pesticides Management Section**
  https://agriculture.delaware.gov/pesticide-management/
  Christopher Wade, Pesticides Administrator
  (302) 698-4570; *christopher.wade@delaware.gov*
  Amanda Strouse, Pesticide Certification and Training Specialist
  (302) 698-4575; *amanda.strouse@delaware.gov*

- **University of Delaware Pesticide Safety Education Program**
  https://www.udel.edu/academics/colleges/canr/cooperative-extension/sustainable-production/psep/
  Kerry Richards, Pesticide Safety Education Program Coordinator
  (814) 880-0013; *kerryr@udel.edu*

Maryland

- **Maryland Department of Agriculture, Pesticide Regulation Section**
  https://mda.maryland.gov/plants-pests/pages/pesticide_regulation.aspx
  Alex Lehmann, Licensing, Certification, and Training Coordinator
  (410) 841-2767; *Alexander.Lehmann1@maryland.gov*

- **University of Maryland Pesticide Education and Assessment Program**
  http://pesticide.umd.edu/pesticide-safety-education.html
  Niranjana Krishman, Associate Professor and Pesticide Safety Education Program Coordinator
  (301) 405-3928; *nkrish@umd.edu*

New Jersey

- **New Jersey Department of Environmental Protection, Bureau of Pesticide Control**
  https://dep.nj.gov/pesticides/
  Michael McConville, Chief
  (609) 984-6568; *Mike.McConville@dep.nj.gov*

- **Rutgers University, New Jersey Agricultural Experiment Station**
  https://pestmanagement.rutgers.edu/rutgers-pesticide-safety-education-program/
  George Hamilton, Pest Management Program Leader
  (848) 932-9801; *hamilton@njaes.rutgers.edu*

Pennsylvania

- **Pennsylvania Dept. of Agriculture, Bureau of Plant Industry, Division of Health and Safety**
  https://www.pa.gov/agencies/pda/plants-land-water/plant-industry/pesticide-programs
  David Husner, Chief (717) 772-5216; *dhusner@pa.gov*
  Matthew Kohan, Pesticide Certification and Education Specialist
  (717) 772-5217; *mattkohan@pa.gov*

- **Penn State University Pesticide Education Program**
  https://extension.psu.edu/about-the-pesticide-education-program
  Jon M. Johnson, Director - Pesticide Safety Education Program Coordinator
  (814) 865-1074; *jmj5@psu.edu*

Virginia

- **Virginia Department of Agriculture and Consumer Services, Office of Pesticide Services**
  https://www.vdacs.virginia.gov/pesticides.shtml
  Nicole Wilkins, Program Manager
  (804) 371-6559; *Nicole.Wilkins@vdacs.virginia.gov*
  Micah Raub, Pesticide Certification, Licensing, Registration, and Training Specialist
  (804) 786-8934; *micah.raub@vdacs.virginia.gov*

- **Virginia Tech Pesticide Programs**
  https://vtpp.ento.vt.edu/
  Daniel L. Frank, Director - Virginia Tech Pesticide Programs
  (540) 231-6543; *dlfrank@vt.edu*

West Virginia

- **West Virginia Department of Agriculture, Regulatory and Environmental Affairs Division**
  https://agriculture.wv.gov/divisions/regulatory-and-environmental-affairs/pesticides/
  Jennifer Shivley, Certification Supervisor
  (304) 558-2209; *jshivley@wvda.us*

- **West Virginia University Extension Service**
  https://extension.wvu.edu/agriculture/farm-management/pesticide-education
  Ronnie Helmondollar, Program Director - Agriculture and Natural Resources
  (304) 293-9464; *RRHelmondollar@mail.wvu.edu*