

GROWERTALKS

Features

1/30/2026

Always Safe, Never Sorry

Mary Ann Rose, Ph.D.



It won't surprise many readers that staying safe and on the right side of the law with pesticides begins with reading and following the pesticide label. Under the Federal Insecticide, Fungicide & Rodenticide Act, the label is a legal document and enforceable. There are many comprehensive articles on how to read a label, but my intent here is to highlight a few key items for greenhouse growers.

Washing up 14-ml. nitrile gloves after application.

Product selection

When reviewing a label for guidance, an important first question is: "Can I use this product in the greenhouse or nursery?" You might look at the list of pests first. And it might surprise you that federal law doesn't require the target pest to be on the label (with some exceptions, including termites and human health). Although consider that if your pest isn't on the label, the product may not be effective on the target.

So how do you know if you can use a product on your crop? Either the crop or use site must appear on the pesticide label. Relevant examples of use sites include greenhouse, nursery and landscape ornamentals.



Left: Not all gloves are acceptable for pesticide application.

Center: Read the label on all chemical applications.

Right: Some greenhouses have large compartments. When there's a ventilation requirement, workers CANNOT be

in the same compartment during or after the application until both the REI and VR are satisfied.

Food crops are an important exception. For any crop grown for consumption, the crop MUST appear on the pesticide label because EPA must establish tolerances or limits on the amount of pesticides that can remain in any food crop. If the crop isn't on the label, the tolerance hasn't been established. Often, crops grown for consumption will appear on labels in EPA-defined crop groups—for example: Leafy vegetables, Crop Group 4.

Be aware that different product formulations, and sometimes different active ingredients, may be sold under similar trade names. Your crop or site may appear on one, but not all, similar formulations, so be sure to review labels carefully.

Greenhouse re-entry

The Agricultural Use Requirements is another section of the label of critical significance to growers. This section may appear side-by-side with the Non-Agricultural Use Requirements on the label, but it describes very different requirements. The Agricultural Use Requirements section always includes a reference to the Federal Worker Protection Standard (WPS) and cites the Code of Federal Regulations (CFR) for this rule: 40 CFR Part 170. This citation is an example of labeling by reference—it requires you to follow the entire standard when using the product as described: on farms, forests (where there's timber production), nurseries and greenhouses.

In contrast, the Non-Agricultural Use Requirements apply to all non-crop production uses; this section doesn't include a reference to WPS and will have a different restricted entry interval (REI).

The example in Figure 1 is taken from a pesticide label. For agricultural uses, note that there's an REI of 12 hours, but for non-agricultural uses entry is allowed after sprays have dried. The much longer restriction on entry for agricultural workers is intended to mitigate their much greater cumulative exposure to pesticides, since many work with pesticide-treated plants every working day.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This 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 the statements on this label about personal protective equipment (PPE) and restricted entry interval.

DO NOT enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours. PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls over short-sleeved shirt and short pants
- Chemical-resistant gloves—EPA chemical-resistance category B (e.g., barrier laminate or butyl rubber ≥ 14 mils)
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure

NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Do not enter or allow others to enter the treated area until sprays have dried

Figure 1. Agricultural and Non-Agricultural Use Requirements from the Avid 0.15EC label.

Personal Protective Equipment (PPE)

It's probably not necessary to remind you that wearing the label-required PPE is a legal requirement. Wearing PPE is the most important way to reduce pesticide exposure to the handler, which is the WPS-term for anyone applying or assisting with pesticide application. The handler's required PPE appears under the Precautionary Statements section of the pesticide label (Figure 2) and is distinct from the early entry workers' PPE that appear under Agricultural Use Requirements (Figure 1). Keep in mind that different tasks may require different PPE. For example, the mixing and loading steps typically involve exposure to a pesticide concentrate and some products may require more PPE than applying the dilute pesticide.

PRECAUTIONARY STATEMENTS

Personal Protective Equipment

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for Category B on an EPA chemical-resistance category selection chart.

Applicators and other handlers must wear:

- Coveralls over short-sleeved shirt and short pants
- Chemical-resistant gloves- EPA chemical-resistance category B (e.g., barrier laminate or butyl rubber ≥ 14 mils)
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing, or loading
- For shadehouse and greenhouse uses, applicators and other handlers must wear a dust/mist-filtering NIOSH-approved respirator with any R, P, or HE filter

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Figure 2. PPE statement from the Avid 0.15EC label.

Also read the label carefully to choose materials with the appropriate level of chemical resistance. Dry or water-based pesticides may only require gloves of any waterproof material. Products that require chemical-resistant gloves will list appropriate materials. Nitrile gloves of at least 14-ml thickness are often a cost-effective choice of

chemical-resistant gloves. However, it's important to review the list of acceptable materials carefully because some pesticides require greater chemical resistance.

A portion of the Avid 0.15EC label is shown in Figure 2. The label cites EPA chemical resistance category B, which you can locate with a quick web search. For category B, butyl rubber or barrier laminate provide high resistance. Nitrile isn't listed on the label—it only provides slight chemical resistance to this product formulation. By definition, "slight" should be cleaned or replaced within 10 minutes of exposure, so it's obvious why nitrile wouldn't be acceptable. As label language is updated, pesticide labels will list all acceptable options instead of citing the chemical resistance chart.

The PPE statement in Figure 2 also contains instructions for cleaning and maintaining PPE. Consider that pesticide residues contaminate every item you wear while spraying. Clothing, nitrile gloves, a respirator—all need to be washed if not discarded. The label also provides instructions to wash PPE clothing with hot water and detergent separately from other laundry.

Note that the Avid 0.15 EC label requires a respirator for greenhouse use. Maintaining a respirator in proper working order and complying with all of the respiratory protection guidelines under WPS requires a deep dive. For purposes of this article, here are a few important reminders:

- Whenever a respirator is required by label, the employer is required to provide the wearer of a tight-fitting mask with an initial medical evaluation, annual fit testing and training in the care and use. Why? The medical evaluation ensures that increased breathing resistance doesn't endanger the wearer's health. Fit-testing ensures that the seal against the face is tight enough that pesticide-contaminated air doesn't leak in. Moreover, wherever that seal meets the face, facial hair must be removed. (That's in the rule!) WPS also specifies a filter or cartridge change-out schedule to ensure they're still providing adequate filtration.
- When a respirator is worn voluntarily (not required by label), WPS doesn't require the respiratory protections described in the previous paragraph, but Occupational Safety and Health Act (OSHA) regulations require the employer to provide an initial medical evaluation and ensure that the mask is kept in sanitary condition.

Ventilation

To conclude, I would like to address WPS ventilation requirements, which are exclusive to enclosed space production. Some greenhouse businesses have very large compartments and the question comes up whether workers can be in the compartment when pesticides are applied to only a small section. It all depends on the pesticide and how it's applied.

First, consider the distinction between the restricted entry interval (REI) and the ventilation requirement (VR). The REI protects your workers from pesticide contact—you must exclude workers from the treated area for the full REI. This could be a few benches or an entire house. The VR protects workers from inhalation exposure, and when it exists, must be satisfied in addition to the REI. The key determinants of VR are pesticide volatility and droplet size. To follow the guidelines properly, you **MUST** read the label and know the droplet size category that your spray equipment produces. Your equipment manufacturer can provide the droplet size category produced by your nozzle or handgun at operating pressures that you use. The droplet size category is referred to as "spray quality" and is defined by the American Society of Agricultural and Biological Engineers Standard S-572.1.

No ventilation requirements

If your application equipment produces medium or coarse droplets, and the pesticide label neither requires a

respirator nor specifies VR, then workers can be in the same compartment during an application with the restrictions given in table 1. They cannot enter the treated zone within the compartment until the REI expires. In most cases, you'll also have to exclude workers from an additional 25-ft. border surrounding the treatment area during application until the REI expires.

Table 1. NO VENTILATION REQUIREMENTS*		
TYPE OF APPLICATION	KEEP PEOPLE OUT OF:	HOW LONG?
SPRAY DROPLETS are MEDIUM or COARSE Nozzle distance < 12" from growing medium e.g., Drench application	TREATED AREA within enclosed space	FOR REI
SPRAY DROPLETS are MEDIUM or COARSE Nozzle distance > 12" from growing medium	TREATED AREA + 25 ft BORDER around treated area within enclosed space	FOR REI
*ASSUMPTION for above: NO ventilation requirement or other restrictions appear on the pesticide label AND respirator not required by label		

Ventilation requirements

When there's a ventilation requirement, workers CANNOT be in the same compartment during or after the application until both the REI and VR are satisfied. VR are in effect for any pesticide requiring a respirator or specifying VR, or when equipment produces spray droplets smaller than the medium category (Table 2). High operating pressures producing fine droplets and fog or vapor-producing equipment aren't unusual in greenhouse production, so these require evacuating workers from the entire compartment until the VR is met. It's important to note that compartments imply solid walls. If the compartment is in any way ventilating into another, that adjoining compartment also must be evacuated until the VR are met.

Table 2. WITH VENTILATION REQUIREMENTS*		
TYPE OF APPLICATION	KEEP PEOPLE OUT OF:	HOW LONG?
Any Pesticide requiring a respirator		MUST SATISFY BOTH REI + VENTILATION REQUIREMENT
SPRAY DROPLETS = FINE* e.g., fogging, smoke, aerosol, total release products, and high-pressure applications	ENTIRE ENCLOSED SPACE*	
*ALSO required whenever label specifies a ventilation requirement		
NOTE: Fumigants are rarely used in greenhouses, and are a special case not addressed here. Fumigants penetrate solid construction materials. They require sealing and vacating the entire facility, a special license category and fumigation		

plan.

How do you satisfy the ventilation requirements? If not specified by label, WPS requires meeting one of the conditions in Table 3. Do you know how long it takes to complete 10 air exchanges for your greenhouse compartments? It may be unique to each compartment since it's dependent on the size of the enclosed space and the ventilation fans' capacity to move volumes of air.

Table 3. WPS Ventilation Requirement – must meet one of these conditions if not otherwise specified on the pesticide label
10 air exchanges
2 hours mechanical ventilation (fans)
4 hours passive ventilation (vents, windows)
11 hours with no ventilation followed by 1 hour mechanical ventilation
11 hours with no ventilation followed by 2 hours of passive ventilation
24 hours with no ventilation

Staying safe and legal may not be a simple proposition, but the first step is clear: READ THE LABEL! **GT**

Mary Ann Rose, Ph.D. is Director of the Pesticide Safety Education Program for The Ohio State University Extension.