



VTPP Quarterly

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Pesticide Safety Tips for the Growing Season

Stephanie Wycoff, Extension Associate, Virginia Tech Pesticide Programs

From purchasing seed to preparing your fields, there are many tasks to complete when planning for the growing season. Many of these tasks put producers in direct contact with pesticides, so it is important to have a good working knowledge of pesticide safety practices. Whether your preparations are underway or just beginning, the tips below can help reinforce pesticide safety practices for your operation.

Take an Inventory of Your Pesticide Storage

Before purchasing any new pesticides for the growing season, take an inventory of the pesticides you currently have stored. Your inventory list should include information such as the product name, purchase date, and quantity purchased. Some products you have stored may be usable for the upcoming growing season. Others may need to be properly disposed of. An inventory will ensure you do not purchase unnecessary amounts of pesticides and can keep you from ending up with excess product. Having an inventory list is also useful in case of emergencies like spills, fires, weather-related incidents, or theft. Regularly inspecting your pesticide storage area is always recommended.

Be Sure You Have Proper PPE

As you inventory your pesticide storage and/or purchase new pesticides, take note of any special personal protective equipment (PPE) required by the label. Some pesticide product labels will list additional PPE for mixing and loading, so be sure to read the label in its entirety. PPE should be chemical resistant and made from materials like rubber, nitrile, neoprene, barrier laminate, etc. You may have PPE leftover from the previous growing season, or you may need to purchase additional supplies. Make sure any PPE you are using from the previous growing season is in good condition with no rips, cracks, bubbling, discoloration, or other damage (fig. 1).

Figure 1. In the photos to the right, you can see how this PPE has degraded over time. The gloves have developed discoloration and cracking (bottom right). The goggles (top right) have severe cracking in the lenses. The goggles and booties (bottom left) are discolored and cracked, and the goggles feel slimy when touched. Degraded PPE should never be worn while working with pesticides.



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Pesticide Safety Tips for the Growing Season (Continued)

If the pesticides you plan to use require an air-purifying respirator, make sure it is approved by the National Institute for Occupational Safety and Health (NIOSH-approved). Keep your respirator clean, and furnish it with fresh filters and cartridges. Perform a fit check (or a user seal check) periodically to ensure your respirator is properly positioned and forms a tight seal around your face. For additional information on fit tests and user seal checks, please visit: extensionpublications.unl.edu/assets/pdf/ec3027.pdf.

Check Your Application Equipment

Properly maintaining your application equipment is essential, especially when your equipment has not been used for a long period of time. For sprayers, check all the components (pumps, hoses, screens, filters, etc.) to ensure they are in proper working order. Flush the lines with clean water, and check for worn or clogged nozzles. As you run clean water through the sprayer system, look for leaks in the nozzle bodies, fittings, hoses, clamps, and tank. Replace any parts that are broken. Before making a pesticide application with any type of equipment, always calibrate your system to ensure it will apply the proper amount of pesticide as directed by the label.

Prepare for Recordkeeping

Keeping records of your pesticide applications has several benefits and, in many cases, is legally required. In Virginia, the following recordkeeping requirements apply:

- Private applicators – Must document applications of all restricted-use pesticides. If they are operating under Worker Protection Standards (WPS), they must document applications of all types of pesticides, including general-use products.
- Commercial applicators – Must document applications of all types of pesticides, including general-use products.

Both private and commercial applicators are required to keep application documentation for two years.

Aside from the legal aspects, recordkeeping will help reduce mistakes, allow you to compare the effectiveness of different applications, and provide documentation for routine compliance investigations. Application records are also helpful if your operation is questioned about residues or damages like drift. Prepare a recordkeeping book(s) ahead of time so you are ready to document pesticide applications when necessary.

It Is Always a Good Time to Be on the Lookout for Ticks: How to Avoid and Manage These Troublesome Pests

Daniel Frank, Director, Virginia Tech Pesticide Programs

With the advent of spring and warming weather, more people are venturing outdoors to work and play. This also means it is a good time to start getting in the habit of protecting yourself from ticks. Ticks (Family: *Ixodidae*) are a parasitic group of arthropods that feed on blood from their animal hosts. They are active year-round (even in the winter when temperatures are above freezing), and are considered important medical/veterinary pests because of their ability to transmit a number of disease agents.

Life History and Habits

The lifecycle of ticks consists of four stages; the egg, six-legged larva (often called seed ticks), eight-legged nymph, and adult (also with eight legs). Ticks must feed (take a blood meal) at each stage to complete their lifecycle, which can take one to three years to complete. Each stage generally feeds on a different animal host. Ticks become engorged after taking a blood meal and drop from the host to find a protected location to molt to the next stage. Adult females begin laying eggs shortly after their final blood meal. Under favorable conditions, ticks can survive for several months without feeding.

Ticks do not jump or drop from trees onto their hosts. They wait in a position known as “questing.” Questing ticks will rest on vegetation (often at ground level to about waist height) with their front legs outstretched waiting to climb on a suitable host as it brushes by. Various stimuli such as body heat, the carbon dioxide that animals produce when they exhale, movement, and other bodily cues of the host can intensify questing behavior. Some ticks may quickly attach and begin feeding once on a host. Others may wander for up to a few hours before settling on a spot to feed.

In order for a tick to take a blood meal without being detected or dislodged, it injects small amounts of saliva with anesthetic properties at the site of attachment. If the tick is infected with a pathogen, it is transmitted to the host through the saliva. A tick initially acquires the pathogen when feeding on an infected host.

Common Species and Medical Importance

Common tick species affecting humans in Virginia include the American dog tick (*Dermacentor variabilis*), blacklegged or deer tick (*Ixodes scapularis*), and lone star tick (*Amblyomma americanum*) (fig. 2).

The American dog tick is commonly encountered west of the Blue Ridge Mountains in Virginia. Although it can be found feeding on dogs (as the name suggests), it will readily feed on numerous other animal hosts including humans. American dog ticks are the primary carrier for the pathogen causing Rocky Mountain spotted fever. It can also transmit the pathogen responsible for tularemia.

The blacklegged or deer tick is commonly encountered in mixed forests and along woodland edges throughout Virginia. The larval and nymphal stages typically feed on small rodents (the preferred host is the white-footed mouse). Deer are the primary hosts during the adult stage. Blacklegged ticks are the primary carrier for the pathogen causing Lyme disease. They also transmit anaplasmosis, babesiosis, and Powassan virus.

The lone star tick is commonly encountered in the Piedmont and Coastal Plain regions of Virginia. Lone star ticks transmit the pathogens causing ehrlichiosis, Rocky Mountain spotted fever, southern tick-associated rash illness (STARI), and tularemia.

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It Is Always a Good Time to Be on the Lookout for Ticks: How to Avoid and Manage These Troublesome Pests (Continued)

Tick Integrated Pest Management

Personal Protection

The most important and effective way to protect yourself from ticks and tick-borne diseases is to regularly check your entire body for attached ticks, and promptly remove and kill any ticks found. The probability of a tick transmitting a disease-causing pathogen increases the longer an infected tick is attached. For example, in the case of Lyme disease, the tick must be attached for at least 36 to 48 hours to transmit the disease. Ticks may feed anywhere on the body, but can commonly be found around the scalp, behind the ears, under armpits or behind knees, and around waistbands. Because tick bites are often painless, most people will be unaware that they have an attached tick without careful visual inspection.

When entering habitat with a high risk of tick exposure (i.e., heavy woods, tall grasses, woodland edges), there are several precautions you can take to limit contact with ticks. When hiking along trails, stay in the center and avoid brushing against weeds and tall grass. Wear light-colored clothing with long pants tucked into socks and shirts tucked into pants. This can make ticks easier to spot and keep them on the outside of clothes. Using a tick repellent on skin and clothing is also highly recommended. The Environmental Protection Agency and Centers for Disease Control list DEET, picaridin, IR3535, oil of lemon eucalyptus, and 2-undecanone as effective active ingredients in tick repellents. Wearing permethrin treated clothing is also particularly effective. If treating clothing yourself, be sure to follow all label instructions and allow the product to dry completely before wearing.

If an attached tick is found, remove it using thin tipped tweezers or forceps. Grasp the tick as close to the skin as possible, and pull the tick upward with steady even pressure. The idea is to remove the tick with its mouthparts intact to reduce the risk of infection. Other methods of tick removal (i.e., petroleum jelly, heat from matches) are not recommended. Removed ticks can be stored in rubbing alcohol in case disease symptoms develop and the tick needs to be identified. National laboratories can also provide Lyme and other tick-borne disease testing on removed ticks (fees usually range between \$50-\$100).

Landscape Management

Desiccation (drying out) is a major cause of natural tick mortality. Taking steps to reduce surface humidity and moisture can make an area less favorable for ticks. For example, keeping grass and weeds mowed, clearing leaf litter, and pruning/removing trees to increase sunlight in areas frequently used by people can help discourage ticks.

There is a positive correlation between the abundance and distribution of the blacklegged tick and the size of white-tailed deer populations. Adult blacklegged ticks preferentially feed on deer. Therefore, deer may bring engorged adult female ticks into a landscape where they can lay eggs and increase tick numbers. Deer management options such as fencing, repellents, guard animals, and deer resistant landscape plantings can help reduce tick populations in an area.

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It Is Always a Good Time to Be on the Lookout for Ticks: How to Avoid and Manage These Troublesome Pests (Continued)

Chemical Controls

If landscape management practices fail to provide adequate tick control, insecticides (called “acaricides” when used for ticks) can help reduce populations. Appropriately labeled acaricides should be applied only to areas where ticks may inhabit (e.g., woodland edges, shady perennial beds). It is seldom necessary to treat an entire yard or lawn area because ticks are unlikely to inhabit areas exposed to full sunlight. Common active ingredients used by pest control professionals include those in the pyrethroid class of insecticides (e.g., bifenthrin [Talstar P, Up-Star]; cyfluthrin [Tempo], pyrethrins [ExciteR, Pyganic]). Spray treatments are most effective when applied using a high-pressure sprayer in the early spring. An additional application in the fall can be used to target adult ticks if populations are particularly high. Pyrethroids should not be applied when pollinators are active, near areas where plants are blooming, or near standing water, streams, or rivers to reduce negative effects to the environment and non-target organisms.

Another option to treat ticks around the home is to target acaricides on small mammals that may be living in the area. In many instances, mice are the reservoir hosts responsible for producing disease carrying ticks (particularly Lyme disease). Rodent targeted devices such as “tick tubes” (e.g., TheraCell), are cardboard tubes containing cotton balls treated with an acaricide. The idea is to spread these around the landscape where mice, or other rodents, will find them and take the cotton as nesting material. Then, any larval or nymphal ticks attached to the animal will contact the acaricide on its fur and die.



Figure 2. From left to right: lone star tick, blacklegged tick, and American dog tick.

The Bees Are Buzzing: Do Your Part to Keep Them Safe

Tim McCoy, Extension Associate, Virginia Tech Pesticide Programs

Spring has sprung, flowers are blooming, and the bees are starting to show their fuzzy faces. Now is the time to decide what you can do to help protect our pollinators from pesticide drift. Whether you are a homeowner intent on ensuring bees have a safe source of pollen and nectar in your backyard, or a grower planning your pesticide applications for the coming season, you can take steps to minimize the likelihood that a pesticide application will harm our valuable pollinators.



Figure 3. Honeybee pollinating flower.

Homeowners can choose plantings that will provide colorful and nutritious flowers for bees throughout the spring and summer, with an eye toward selecting plants that need minimal pesticide applications. If you do need to control pests in your garden this year, consider using an integrated pest management (IPM) approach. IPM explores all control options before relying on a pesticide fix. There are several IPM-related Virginia Cooperative Extension (VCE) factsheets that can help determine which control measure will best solve your pest problems while safeguarding bees as much as possible. VCE's new publications website is: resources.ext.vt.edu.

If you decide to use a conventional pesticide to combat a pest problem, always select the least toxic solution that will still provide control. This is especially important when selecting an insecticide. Bees are particularly sensitive to certain classes of insecticides (namely pyrethroids and neonicotinoids). These chemicals should be used with great care. Follow all label directions, and pay special attention to prevent pesticides from drifting into areas you do not want them to go. Pesticide "drift" is the movement of pesticides away from the target site during or after application. Pesticide dusts have the greatest potential to move during application because the particles are so small. Granular formulations, by contrast, have the least potential to drift. Pesticide sprays are prone to drift because of the small droplets formed during application. When applying sprays, if you can adjust your sprayer (even a handheld trigger-type spray bottle) to deliver larger droplets, you can reduce the chance your pesticide will drift.

Homeowners can further reduce the likelihood of drift by planning applications during times of light wind and using drift shields on spray nozzles. Aim to apply pesticides when the breeze is below 10 mph and ideally less than 5 mph. Be aware of what is downwind of your target, and NEVER apply insecticides directly to blooms as this is where bees will be visiting. Additionally, you can install drift shields on spray nozzles. These devices form cone-shaped sprays to direct more of the pesticide at your target plant.

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The Bees Are Buzzing: Do Your Part to Keep Them Safe (Continued)

Large-scale growers should follow all of the suggestions above, but there are more things that you can do to help safeguard bees in your area. Follow all the drift mitigation directions outlined on your pesticide label. Select nozzles and operating pressures that will give you the largest drops while still providing the coverage you need. Whenever possible, use drift shields on your equipment or adjust boom heights to minimize drift.

Another way growers can safeguard bees during applications is to enroll in the Virginia Department of Agriculture and Consumer Service's (VDACS) free, voluntary BeeCheck program. Once registered with the program, growers can find out where registered beekeepers have their active hives. This information is meant to create pathways for communication among applicators and beekeepers so both parties know where and when pesticide applications will occur.

An applicator can contact a participating beekeeper to let them know of a scheduled application. This will allow the beekeeper to either move their hives or close them up for a period of time bracketing the application (honeybees can be safely confined in their hive with appropriate preparation). As of spring 2021, there are 1,324 beekeepers and 212 pesticide applicators registered in the BeeCheck system. The BeeCheck program is just part of a larger effort by VDACS to protect pollinators. Learn more about Virginia's Pollinator Protection Plan by visiting VDACS at: vdacs.virginia.gov/plant-industry-services-pollinator-protection-plan.shtml.

Regardless of whether a grow operation is a big crop or a small backyard garden, applicators can protect bees by practicing IPM and taking reasonable precautions to ensure pesticides go no further than intended. If we all do our part, we can ensure the bees in Virginia stay healthy and can perform their valuable pollination services!

»Blast From the Past«

Stephanie Blevins Wycoff, Extension Associate, Virginia Tech Pesticide Programs

The Wigginton Mouse Exterminator

This old-timey mousetrap was manufactured in 1918 by the Wigginton Company, located in Winchester, Virginia. The trap allowed rodenticide to be positioned in the end of the glass tube, with a small hump in the tube to keep the rodenticide in place. The tube was designed so a mouse could slip in and eat the rodenticide, then slip back out of the tube until the next mouse came along. The trap was small enough to protect larger animals from poisoning while keeping pest mice populations to a minimum.



Figure 4. The Wigginton Mouse Exterminator (1918).

Updates From Virginia Tech Pesticide Programs

Farm and Agriculture Safety Training From EHS

Virginia Tech Environmental Health and Safety (EHS) received grant funding to develop and provide a Farm and Agriculture Safety Training (FAST) program. The FAST program aims to reduce illness, injuries, and fatalities on farms throughout Virginia by providing training in four focus areas: 1) ATV safety, 2) fall prevention, 3) hazardous chemicals, and 4) how OSHA rules apply to agricultural operations. Environmental Health and Safety is looking for farmers or agricultural employers who would like to participate in these trainings, as well as trainers willing to teach the FAST program in their communities. For more information about the FAST program, and how to participate as a farmer or trainer, please visit: ehs.vt.edu/FarmSafety.html.



New Resources Available From PERC

The Pesticide Educational Resources Collaborative (PERC) has released a social media toolkit to help promote worker safety. The toolkit includes a series of 17 images in English and Spanish (34 total) that feature safety messages that are meant to minimize pesticide exposure to farmworkers and their families.

To download these images, visit: pesticideresources.org/wps/socialmedia/index.html.

This kit was produced with support from the U.S. Environmental Protection Agency (EPA), the Pesticide Educational Resources Collaborative (Cooperative Agreement #X8-83616301), and the Association of Farmworker Opportunity Programs (Cooperative Agreement #X8-83237601). The text was reviewed for accuracy by EPA personnel, but it does not necessarily reflect the views of the EPA. If you are interested in modifying the images before sharing, please contact percsupport@ucdavis.edu.

If you have any questions, please direct them to PERC using the contact information above. Please share this announcement as appropriate.