

PROTECT VIRGINIA'S SENSITIVE AREAS

CONTROL YOUR DROPS - and - CONTROL YOUR DRIFT!

Virginia's Changing Environment

With the urbanization of many agricultural areas, Virginians increasingly find themselves in situations where the offsite movement of pesticides presents a liability for the grower and a fear of exposure by nearby residents. Pesticide drift is NOT acceptable because any violation of the pesticide label directions can bring state and federal legal response. You can control pesticide drift with knowledge and responsible application practices.

What Is a Pesticide?

A **pesticide** is any substance used to control a pest. Pests include: weeds, insects, disease-causing organisms (fungi, bacteria, etc.), vertebrate pests, and any organism that is a nuisance to humans or can potentially damage our health, environment, or material goods. Pesticides include: herbicides (weed killers), insecticides, fungicides, bactericides, nematocides, disinfectants, desiccants, miticides, sterilants, fumigants, and others.

What Is Drift?

Pesticides sprayed on crops and other sites can drift. **Drift** is the uncontrolled movement of pesticides through the air away from a target site. Drift is largely a problem with liquid pesticides but can also occur with dry formulations. With liquid formulations, it is all about the "drops." **Drops (droplets)** are small particles of liquid spray containing pesticide active ingredients that come out of a sprayer nozzle. **Control your droplet size, and you can control where your drops will land.** Large drops are more likely to settle on the target area. Smaller drops are more likely to move off-target. A small droplet is less than 150 microns in size (very close to the diameter of a human hair).

Types of Drift:

- **Particle Drift** – movement of fine particles through the air away from the target site of application. This type of drift only occurs while the pesticide is being applied.
- **Vapor Drift** – movement of pesticide as a gas or vapor during or after application. Some formulations and active ingredients are more prone to vapor drift than others.



What Is a Sensitive Area?

Drift can occur anywhere. When it becomes a problem, drift is usually associated with areas where there are people, other nontarget animals, or valuable plants. Drift can also be a problem when it comes into contact with sensitive surfaces – such as the shiny new paint of an expensive automobile. Sensitive sites include:

- **Schools and Daycare Facilities**
- **Hospitals and Healthcare Facilities**
- **Homes and Office Buildings**
- **Recreation Areas and Playgrounds**
- **Nontarget Plants and Animals**
- **Wildlife Refuges and Protected Areas**
- **Beehives and Areas with Pollinators**



How Do You Protect Sensitive Areas?

There are a number of **best management practices** that pesticide applicators, landowners, and managers can use to prevent pesticide drift from impacting sensitive areas.

Keep Pesticides Away from Sensitive Areas: Applicators should never apply pesticides when the wind is blowing toward

sensitive areas. Locate crops at a distance where drift can be intercepted by a barrier or can settle harmlessly on your property. No matter how much you think you can prevent problems, or how readily you think your neighbors will accept your activities, if you plan to apply pesticides on your land, you should assess the area well beyond your property lines for possible sensitive areas. Plan carefully before you buy, build, plant, or spray.

Locate Sensitive Areas Away from Pesticide Use: Sensitive areas should NOT be located near sites where pesticides are applied routinely. For example, locating a school downwind from an agricultural field is not recommended regardless of whether the drift should remain on site. Often landowners buy property near an agricultural site or a turf area and cut down the natural barriers between the two sites. Doing so can allow pesticides to drift onto your property. Leaving barriers intact provides natural protection from drift. Locate sensitive areas away from property lines and maintain fencerows. Make sure you are aware of all land use around a property before you buy it or locate a sensitive area on this land. Proper planning and consideration may save you possible conflict and anxiety later.

Use Buffer Zones, Barriers, or Windbreaks: It is possible to reduce spray particles from drifting offsite by using various types of barriers. Barriers are NOT foolproof solutions, nor can they substitute for proper location and application.

Windbreaks are barriers, such as a line of trees, designed to reduce wind movement. They should be upwind and affect an entire spray site if possible. To be effective, windbreaks may need to be several times higher than the highest release point of the

spray material. When located farther away they can lose their effect.

Spray buffers are not the same as windbreaks. They can be man-made or natural. They are located directly downwind (from the prevailing wind direction) from a spray release area and are designed to catch spray drift. Buffers should be several times higher than the spray release height. If located farther away they will lose their effect. **Vegetative buffers** should cover up to 90 feet away from the release site. They are more effective if they are a mixture of vegetation and open areas to break up wind patterns. Their effectiveness will vary depending upon the lay of the land and the weather conditions.

Buffer zones are areas where no pesticide application should occur and are designed to catch off-target spray on their surfaces. If buffers are open areas, they will depend on distance to allow spray materials to settle. This means they need to be relatively wide areas (over several hundred feet) and will be more effective if vegetation or other surfaces are present. Most sprayers (ground and aerial) have defined distances that spray can travel after release. These data are specific to crop and sprayer type, and knowing them can help you determine the size of a buffer zone. To determine this information, contact your local Extension agent or go to the Spray Drift Task Force website at URL:

<http://www.agdrift.com/>.

Select The Proper Chemicals: Choose pesticides with **minimal toxicity** to nontarget species. Avoid volatile pesticides because they can move off site in the form of vapor drift hours after application. This is especially important if there are sensitive plants like grapes, tomatoes, tobacco, soybeans, cotton, or other fruit and vegetable crops planted nearby.

Choose chemicals that can be applied in large drops, or substitute formulations that are less likely to drift (i.e., granules, pellets, or baits). Avoid ultra low volume (ULV) formulations if you seek to keep droplets large enough to avoid drift. Drops should be large enough to avoid drift, yet small enough to allow adequate penetration of foliage for effective pest control. You may have to increase spray volume with larger droplets.

Consider IPM or Non-chemical

Alternatives: All applicators should practice integrated pest management (IPM). Integration of alternative control measures saves money and reduces the number of pesticide applications. Contact your Extension agent for more information on IPM and sustainable agricultural practices.

Choose Application Equipment with Drift

Guards: Some application equipment has drift reduction devices already installed, including air assist and boom skirts. Shields, skirts, and other devices can be retrofitted on older sprayers to reduce drift. In Virginia, there may be tax advantages available to support retrofitting spray equipment to reduce environmental pollution.



Choose Low-Drift Nozzles and Maintain Your Sprayer:

The major contributor to drift from liquid pesticides is small droplet size. Sometimes the spray nozzles themselves can cause droplets to fragment. Drift-reduction nozzles (tips) are designed to keep droplets intact and reduce drift. Nozzles should be replaced when they show signs of

wear. Calibration, flow meters, and observation of spray patterns can indicate worn or clogged nozzles. Replace worn nozzles with new drift-reduction nozzles.

Choose Favorable Weather Conditions:

Wind, low humidity, and high temperatures all contribute to pesticide drift. Do not spray when atmospheric conditions are highly unstable (thermals) or highly stable (inversions). Avoid application during a dead calm or in light winds (<2 mph) because fine particles can move unpredictably. Ideal conditions would be a steady cross wind blowing at 3-9 mph. Do not spray if the wind is blowing above 10 mph, or at any speed, if the wind is blowing toward a sensitive area. High temperature (>82°F) and low humidity (<50%) encourage droplets to evaporate, become smaller, and drift. **Continually monitor weather conditions at the site.**

Keep Accurate and Thorough Records:

Good recordkeeping is key to protecting yourself from false accusations, unnecessary enforcement actions, and potential liability. There have been cases where growers who kept accurate records prevented themselves from being sued or fined because their records proved when and what they applied on their property. Contact your Extension Agent for help with pesticide recordkeeping.

Keep the Application On Target:

Proper equipment operation, maintenance, and proper and careful pesticide application under favorable weather conditions help achieve effective and efficient pest management. Minimize ground rig boom (release) height by converting to 110° nozzles or angling nozzle bodies. Keep speed and nozzle pressures to a minimum.

Communicate: Communicate with your neighbors and maintain a good relationship to prevent disagreements and misunderstandings. Communicate with your

local Extension agent. Virginia Cooperative Extension teaches drift minimization as part of its pesticide safety education programs. These programs are available to you in your community.



YOUR PRIMARY RESOURCE:

<http://vtpp.org>

For More Information, Contact:

Virginia Department of Agriculture and Consumer Services, Office of Pesticide Services, P.O. Box 1163, Richmond, VA 23219 – 804-371-6558 or on the Web at: <http://vdacs.virginia.gov/pesticides>.

Virginia Tech Pesticide Programs, Dept. of Entomology, 34 Agnew Hall – 0409, Blacksburg, VA 24061 – (540) 231-6543 or on the Web at: <http://vtpp.org>.

Virginia Cooperative Extension – Your local Extension agent is listed under the Blue Pages of your telephone book or on the Web at: <http://www.ext.vt.edu/offices>.

National Pesticide Information Center (NPIC) — (800) 858-7378 or on the Web at: <http://npic.orst.edu>.

USEPA – Office of Pesticide Programs on the Web at: <http://www.epa.gov/pesticides>.

Written by: M. J. Weaver (Virginia Tech Pesticide Programs) and W. W. Surlis (VDACS – Office of Pesticide Services), October 2005.