Keeping Pesticides on Target

Pesticides are bad for pests, and this is the very reason why we apply them. In doing so, however, not all of the applied pesticide stays on target. And when pesticides do not stay at their registered target site, they can cause problems for more than just pests – water contamination; contaminated soil; damage to sensitive crops; injury to honeybees, birds, and other wildlife animals; livestock poisoning; and harm to endangered species and/or their habitat – are some of the problems that may result.

Pesticide Movement

The two primary causes of pesticides leaving the target site are movement by water, and by drift. Water can move pesticides horizontally in water and soil runoff, and also vertically by leaching downward through porous soils. Drifting of pesticide spray particles is a major source of movement off target because the small, fine particles can travel long distances and damage other crops, garden plants, landscape plants, or high-value crops such as ginseng, grapes, tobacco, or cranberries.

Protect Surface Water

Contaminated soil runoff is the most common cause of pesticides entering surface waters. To reduce the amount of runoff from entering surface waters, growers can use conservation tillage, crop residue, and buffer strips. Buffer strips increase the distance between the treated area and sensitive sites, reducing concerns for both drift and runoff.
Setback Requirement
Unlike at mixing and loading sites, Wisconsin does not have a legal setback requirement from surface waters, wells, or other sensitive areas during the actual application of a pesticide. However, some labels do. The labels of these pesticides, and any product containing these pesticides, specify a setback distance from surface waters and/or wells during an application.

Protect Groundwater
To protect groundwater, Wisconsin has set limits for the presence of contaminants in groundwater. If the contaminant level approaches the set limit for a given chemical, the persons responsible must take steps to prevent further contamination. Labels of highly-soluble pesticides, such as atrazine, contain groundwater advisory statements warning users that the pesticide is more subject to leaching under certain soil conditions.

Pesticide Drift & Overspray
In regard to pesticide drift, it’s important to note the difference between drift and overspray. Pesticide drift occurs when air currents cause spray particles to move and be deposited beyond a target application site. Pesticide overspray occurs when you directly apply a pesticide outside of the target area, for example, when your spray boom overhangs a nearby drainage ditch or other non-target area. Because it is always avoidable, overspray is prohibited under all circumstances.

Spray Droplet Size
Spray droplet size is the most important factor affecting the potential for particle drift, which is the movement of spray droplets produced at the time of application. The most effective way to reduce drift potential is to apply large droplets, typically in the range of 150 -200 microns in size. The smaller the droplets, the greater the proportion of driftable particles.
**Spray Nozzles**
The majority of nozzles are classified as producing either fine, medium, coarse, or very coarse droplets. Pesticide labels will instruct you as to what droplet size is necessary for your particular application. Some labels will even list specific nozzle types to use, or not to use, to produce the desired spray droplet size. Other measures that will help you produce a coarser spray include:

- Lowering sprayer pressure, and
- Using drift-reduction agents.

**Wind Speed**
The smaller the droplets, the farther they are carried by wind, which is the second most important factor affecting the potential for particle drift. In many situations, wind speeds less than 10 miles-per-hour are acceptable if sensitive sites are not adjacent to the application site. To help droplets settle sooner and be less vulnerable to wind, use the lowest boom height that still provides uniform coverage.

**Check Site Conditions**
Even before you load your sprayer, find out what conditions are like at the site, and know the locations of surrounding sensitive areas, including residences. It will be harder to refrain from spraying once you are at a site with a fully loaded sprayer. Under some conditions, such as excessive wind, there is NOTHING you can do to prevent drift EXCEPT to refrain from spraying.

**Grapes and 2,4-D**
A classic example of needing to know where sensitive areas are located is when wanting to spray 2,4-D near vineyards. Grapes are highly sensitive to 2,4-D. And, as already stated, WI has no fixed restrictions for buffer zones, and not all labels require setbacks so common sense must prevail. Using alternative herbicide products may be the better choice when spraying near vineyards.
Sources of Pollution
Pesticide drift, runoff, and leaching are examples of non-point sources of pollution; that is, pollution that has no well-defined source. But point sources, such as spills or back siphoning, cause the most severe cases of surface or groundwater contamination. Regardless of the source, however, the end result is the same: reduced water quality.

Advance Notice to Beekeepers
Even if pesticides are confined to the target site, they can pose a risk to nontarget animals, especially honeybees. Many insecticides used in crop production can result in high bee kills. If you or a hired custom applicator apply an insecticide that is labeled as being “highly toxic to bees”, you, and not the custom applicator, must give a 24-hour advance notice to beekeepers who have requested in writing to receive such information, and who have beehives within 1 and ½ miles of the treated site.

Scout Fields
Scouting a field just prior to an application will determine whether honeybees are present, as well as other beneficial insects, such as predators and parasites of insect pests. Making an insecticide application while they are present most likely will kill these beneficial insects.

Biomagnification
Other animals are at risk even when direct contact with a pesticide doesn’t happen. Some pesticides can build up, or bioaccumulate, in the bodies of individual animals that eat treated insects or plants. Then, when an animal higher up in the food chain eats individuals from the lower level, the pesticide can become increasingly concentrated until poisoning occurs; this is called biomagnification.
Birds in Field
Birds are especially at risk from eating treated seed. Be sure your planting equipment covers any soil insecticide and seed with soil, particularly when you lift the planter out of the ground at the field ends.

Endangered Species
Beginning in 2010, some pesticide labels will instruct users to obtain an Endangered Species Protection Bulletin. These bulletins provide specific pesticide use limitations in your county to protect listed species and their habitat. You must use the bulletin that is valid for the month and year in which you apply the product. To obtain the required bulletin for your area, you can either go online to EPA’s Bulletins Live! website, or call their toll-free number.

Animal Toxic Response Team
Farm animal poisoning from pesticides is rare, but when it does occur, the financial losses can be staggering. If you suspect livestock or poultry have been poisoned by pesticides, first call your veterinarian. If necessary, he or she will contact the state's Animal Toxic Response Team. The Response Team’s goal is to protect you and the public from contaminated milk and meat produced from an animal that might have had accidental contact with pesticides.
Summary
As you well know, pesticide movement off-site can occur in various forms, and the consequences of off-site movement are just as varied: illegal pesticide residues on neighboring crops, property damage, water contamination, and harm to nontarget organisms are just some problems off-target pesticides can cause.

Keeping pesticides on target is your job --- and responsibility! Continue to use sound pesticide management measures and avoid getting yourself in situations that will compromise the protection of your environmental surroundings.

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