Apply the Coarsest Spray

You cannot eliminate small droplets, but you can use several techniques to reduce the proportion of small droplets in the spray.

Spray Pressure

Increased spray pressures increase the number of small droplets produced, so keep pressure as low as possible within the range for the nozzle and product you are using.

Nozzle Selection

Nozzles with larger openings or narrower spray angles will produce fewer fine droplets. However, wider spray angles may allow you to bring the nozzles closer to the target surface, doing so more than compensates for the finer spray. Some nozzles (e.g., Turbo Flat-fan, Air-induction nozzle) are specifically designed to produce fewer fine droplets.

Spray Rate

Higher spray rates (GPA) let you use nozzles with larger openings. Thus, if you need to increase the spray rate, use larger nozzles rather than increasing spray pressure.

Drift-Reduction Agents

These adjuvants may reduce the number of small spray droplets. They will also, however, reduce coverage of the plant surface, so be sure to use adjuvants according to directions on the pesticide label.

A pesticide label may require the use of drift-reduction agents under certain conditions (e.g., low spray rates).

Keep in mind that no single management practice will adequately reduce drift; you need to use a combination of measures mentioned here.

Stop spraying if conditions become unfavorable. Remember, pesticide drift management begins with you.

Managing Pesticide Drift in Wisconsin: Field Sprayers

In recent years, documented cases of pesticide drift have increased in Wisconsin. This bulletin is designed to help field sprayer operators reverse that trend.

What Is Pesticide Drift?

Pesticide drift occurs when air currents cause pesticides to be deposited outside a target application site. This definition excludes overspray, which occurs when pesticide is directly applied outside of the target area.

What Are the Consequences of Pesticide Drift to the Applicator?

Because pesticide drift can harm you, you may be subject to civil, criminal, or administrative penalties (e.g., fines) if you use or direct the use of a pesticide in a manner that results in significant pesticide drift, which is drift in amounts that:

- Cause actual harm to persons, property, or the environment;
- Could potentially cause such harm under any reasonably foreseeable circumstances; or
- Are readily visible.

There are also costs associated with drift complaints.

All complaints of drift made to the Wisconsin Department of Agriculture, Trade and Consumer Protection will be investigated. In Wisconsin, drift accounted for 50% of all pesticide use violations from 1995 through 1997.

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What Causes Particle Drift?

Drift decreases as...

- Spray droplet size decreases
- Smaller droplets fall more slowly and are more easily moved by wind

Wind speed increases

- Droplets are carried farther before they can be impinged

Nucleation height from target surface increases

- Larger droplets are more likely to form in the air, or when there is nearly no wind. Small droplets move with the wind, but large ones will fall to the target surface.

Temperature rise and relative humidity increases

- Inversions are influenced by vapor drift in addition to checking site conditions and assessing the reflects actual site conditions and won’t help prevent drift except to refrain from spraying.

Spray droplet size is the most important factor affecting the potential for particle drift. Wind speed is also very important; however, increasing droplet size can greatly reduce the wind’s effect.

The active ingredient is not a significant factor in particle drift (though it is in vapor drift, discussed later). The effects only counteract those of the wind and physical properties of the spray mix are also much smaller than those of droplet size, wind, and relative humidity.

The Importance of Physical Conditions

The pressure to spray is greater when there is a small window of opportunity for making the application, as when a crop is nearing the maximum growth stage. Suppose, for instance, that you plan to apply a herbicide to a field of soybeans in the next field, for example, if you know that your application will not be delayed by unsuitable conditions. Let us assume that you are a professional, you will not apply pesticides under unsuitable conditions.

The Decision: Not to Spray

If you consider that drift is likely and serious consequences are avoidable, or if you cannot adequately assess this risk (e.g., because of temperature inversion or no wind), DO NOT MAKE THE APPLICATION. Although this sounds simple, the reality is that imminent pest damage, impatient customers, and schedule-wielding supervisors can put enormous pressure on you to spray anyway. You need to remember, though, that you are responsible for any adverse effects that arise from an application you make. And that as a professional, you will not apply pesticides under unsuitable conditions. Let us assume that you know how to make a decision wisely.

Dealing with Customers

If you are a commercial applicator, you also need a supervisor who will support your decision (though it is up to you to begin the process).

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