# The Influence of Droplet Size on Potential Distance of Drift

<table>
<thead>
<tr>
<th>Droplet diameter (microns, magnified)</th>
<th>Time required to fall 10 feet</th>
<th>Type of droplet</th>
<th>Drift distance droplets travel in a 3 mph wind, while falling 10 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>66 minutes</td>
<td>Fog</td>
<td>3 miles (15,840 feet)</td>
</tr>
<tr>
<td>20</td>
<td>4.2 minutes</td>
<td>Very Fine Spray</td>
<td>1,100 feet</td>
</tr>
<tr>
<td>100</td>
<td>10 seconds</td>
<td>Fine Spray</td>
<td>44 feet</td>
</tr>
<tr>
<td>240</td>
<td>6 seconds</td>
<td>Medium Spray</td>
<td>28 feet</td>
</tr>
<tr>
<td>400</td>
<td>2 seconds</td>
<td>Coarse Spray</td>
<td>8.5 feet</td>
</tr>
<tr>
<td>1,000</td>
<td>1 second</td>
<td>Fine Rain</td>
<td>4.7 feet</td>
</tr>
</tbody>
</table>

SOURCE: www.weeds.iastate.edu/mgmt/2002/windy.htm

## What is spray drift? Who does it affect?

Everyone has delighted in watching the flight of dandelion seeds in a soft breeze. The same forces which set those nearly weightless seeds adrift can cause sprayed pesticides to wander from an orchard. Sprays drift when winds carry tiny droplets of sprayed pesticides to any nontargeted area. Airborne pesticide droplets can easily travel up to three miles away from their intended target (see chart above).

Spray drift from pesticide applications can expose people, wildlife, and the surrounding area to pesticide residues that can harm humans, neighboring crops and other property. Some areas and people are more sensitive to pesticide exposure than others—take greater precautions around schools, roads, homes, open water, and other areas that could be harmed by drift.

Access to effective, affordable pest control products for your crop relies on everyone’s continued responsible use of them. Even if you are not personally applying the products, take time to review these guidelines with your applicator to make sure their approach and attitude about spray drift align with yours.

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## Spraying Safely

Even after you have determined that your “spray safely plan” includes spraying the right product, at the right time, in the correct manner, an applicator can further reduce potential drift by following a few guidelines.

- **Turn off the sprayer when exiting ANY spray row.** If the applicator shuts off the sprayer outside the tree row regardless of their location on the farm, it will become habit. “If you always do it, you’ll always do it.”

- **Start spraying only when nozzles are adjacent to the first trees in the row.**

- **Periodically check sprayer coverage by placing water-sensitive paper in a few areas of the tree canopy.** Compare patterns to check uniformity.

- **Reduce the distance from the nozzle to the target.** The shorter the distance the droplet has to travel, the less chance it will be lost to wind and evaporation.

- **Set up spray equipment for the most efficient application possible.** Use sensor-guided orchard and weed sprayers, place properly sized nozzles in the correct positions on the spray boom, and adjust air flow to match delivery to the target.

- **A lower spray pressure is less likely to lead to equipment failure and will reduce the number of small droplets produced by conventional nozzles without reducing efficacy.** Always follow sprayer manufacturer’s recommendations.

- **Use spray nozzles adjusted for the tree canopy.** Set nozzle pattern to match tree height and shape. Reduce the size of the lower nozzles when the lower canopy is thin or non-existent.

- **Use protective shields on herbicide sprayers to help reduce movement of fine droplets off target.**

## Sensible Spraying

Using a lower toxicity pesticide—even if it costs more—when spraying close to vulnerable areas will help reduce harm caused by potential drift. Avoid spraying during weather which is likely to cause drift (see Weather Conditions) and in areas known to be sensitive to pesticide exposure. Best practices include the following:

- **Spray when the wind is blowing away from sensitive locations, or use a low pressure hand gun application adjacent to the area.**

- **Spray adjacent to roads very early in the morning (with the help of a spotter).**

- **Only spray towards the inside of a row on the perimeter rows, so that the spray moves away from sensitive areas.**

- **Use a pesticide registered for the crop that is in the next field whenever possible, so if drift occurs it is not an illegal residue on that crop.**

## Weather Considerations

The weather has a major effect on the probability of spray drift. By understanding how weather conditions increase the likelihood of drift, you can make better informed decisions on timing your spraying.

### Wind Conditions

Avoid spraying when winds are above 10 mph (too windy) or below three mph (higher inversion risk)

### Temperature & Humidity

Avoid spraying when temperatures are high and humidity is low. Low humidity and high temperatures can cause evaporation of the droplets as they spray out from the nozzle. Smaller droplet sizes increase the risk of spray drifting away from the crop.