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Off-Target Pesticide Movement

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As planting begins to wrap up, we move on to the next phases of ensuring a bountiful harvest and this includes post-emergence herbicide applications. We want to make sure that all our pesticides are applied onto our intended targets, but often off-target herbicide damage does occur and here are some of the causes and how to avoid them.

Spray Contamination

Growing up, we used to call this "60-foot disease". I've since had to update this to "120-foot disease" with the increase in size sprayers used today. This damage is caused when leftover pesticides from previous applications are not fully removed from the sprayer. The common areas are the tanks, hoses and nozzles not being completely drained, rinsed and cleaned. In instances when booms are not completely flushed, the previous mix is applied, and the damage creates a "V" shape the width of the boom. With contaminated tanks, even though the residue is diluted, there can be enough potency to cause damage to the non-target crop. When switching products, it is important to make sure the tank, hoses, pumps, and nozzles are rinsed and cleaned using clean water and approved cleaners.

Drift

Drift is the physical movement of the spray droplets onto the non-target species, most often associated with wind. There are many ways to reduce the risk of drift, including:

Nozzles: There are many nozzle selections that result in larger droplets which are heavier, lowering the risk of drift. Consult the label for recommendation or restrictions on nozzles.

Pressure: Higher spray pressure creates finer droplet sizes. Be sure to stay in the recommended pressure range for nozzle and product.

Boom Height: Keeping the boom height lower, and closer, to the crop canopy reduces the time that the particles are in the air.

Volume: Higher volumes of carrier help to reduce droplet size and help to improve coverage.

Spray Adjuvants: there are spray adjuvants that help to avoid fine spray particles. Always consult the label before using.

Temperature Inversion

Temperature inversions are the hot topic right now in pesticide application. Normally, the air gets cooler the higher you go into the sky. In a temperature inversion, there is a warm layer of air that traps cooler air close to the earth's surface, this prevents air from mixing vertically. Some pesticides do volatize and instead of moving upward and becoming diluted, they tend to linger in the air and can move horizontally onto a non-target species resulting in crop injury. While this is often attributed to herbicides, more labels are issuing regulations on applications during a temperature inversion, including fungicides.

Fortunately, technology has come through and provided websites and mobile phone apps to help applicators avoid temperature inversions.

- BASF's Engenia temperature inversion website can be found at: https://www.engeniaspraytool.com/
- Bayer's RRXtend Spray app is available for IOS and Android devices; information available at: https://www.roundupreadyxtend.com/stewardship/spray-app/Pages/Roundup-Ready-Xtend-Spray-App.aspx

Sources:

1. https://www.ag.ndsu.edu/publications/crops/air-temperature-inversions-causes-characteristics-and-potential-effects-on-pesticide-spray-drift
2. https://agcrops.osu.edu/newsletter/corn-newsletter/five-tips-reduce-spray-drift