

Warmer temperatures are in the forecast for the latter part of June across Kansas. For July, the Climate Prediction Center is calling for an increased probability of warmer-than-normal temperatures statewide. If you are planning herbicide applications, here are some things to consider when applying herbicides during hot weather.

1. Heat or drought stress slows plant growth processes. This is especially important for systemic herbicides such as glyphosate and grass-killing herbicides like clethodim (Select) or quizalofop (Assure). As temperatures increase above 85°F, many plants begin to slow or stop metabolic processes that move herbicides throughout the plant, resulting in decreased weed control. Notable exceptions to this rule are HPPD-inhibiting herbicides like Callisto or Balance Flexx. Palmer amaranth plants can overcome applications of these herbicides when applied at high temperatures (90°F and greater) due to faster metabolism.

Management: In general, applying systemic herbicides early in the morning, after plants have had a chance to recover from heat stress, will give the best chance for the herbicide to reach the active site and effectively kill weeds.

2. Leaves change in response to heat. To prevent water loss, plant cuticles become waxier in response to heat or drought stress. The greater wax content makes it more difficult for water-based spray solutions to penetrate the plant. In addition, the leaf angle of many plants changes in response to heat or drought stress. This can result in less herbicide contacting the leaf surface to enter the plant.

Management: Using maximum labeled rates of herbicides and surfactants can help get more spray solution into the plant, increasing effectiveness. Spraying during the cooler parts of the day will reduce the impact of altered leaf angle.

3. Crop response to foliar applied, non-translocated herbicides is greater in hot temperatures. When applied in hot, humid conditions, contact herbicides, such as Cobra, Liberty, or Reflex will likely result in greater foliar injury to crops, but also greater weed control.

Management: If possible, postpone application of these herbicides if temperatures are over 90°F. If weed size requires immediate herbicide application, reduce the rate of herbicide and adjuvant, and apply later in the day, when the air temperature will decrease after application.

4. Herbicide volatility increases with high temperatures and low humidity. Herbicides in group four, such as dicamba and 2,4-D are prone to volatility, which means the herbicide becomes a vapor and can move long distances with slight breezes. Volatility of these herbicides increases as temperature rise above 60°F and is greatest at temperatures above 90°F.

Management: Avoid applying these herbicides when temperatures are over 90°F. This may occur during morning or late afternoon hours when temperature inversions are likely to occur. Herbicides should not be sprayed during inversions, when small spray droplets can become trapped in a layer of cooler air near the earth's surface. Use larger spray droplets to reduce

evaporation, which can be accomplished by reducing spray pressure or increasing nozzle orifice size.

The use of trade names is for clarity to readers and does not imply endorsement of a particular product, nor does exclusion imply non-approval. Always consult the herbicide label for the most current use requirements.