Glyphosate Efficacy in Cold and Wet Spring Conditions

Springtime is anything but predictable, and this can be frustrating when you're trying to implement a successful weed control program. Cold, wet weather can negatively impact herbicide performance.

Rainfall

Many herbicide products on today's market come with recommendations on how much time must elapse between product application and subsequent rainfall to ensure good product performance. This time frame is referred to as the rainfast period.

Generally, product rainfast ratings are based on good growing conditions. Poor conditions may require a longer interval between application and any rainfall to ensure adequate product translocation within the plant before wash-off occurs. For many products, any amount of rainfall soon after spraying has the potential to reduce control.

When tank mixing Roundup® brand herbicide products with permissible tank-mix partner herbicides, be sure to consider the rainfast period of those herbicides when planning your application. Check your glyphosate product label for performance guarantees.

Temperature

Fortunately, glyphosate performs well under a wide range of temperatures. You'll see the best performance when temperatures are in the 60 to 75 °F range and remain there for a few hours after application. At these temperatures, most plants will be actively growing and not experiencing temperature stress.

When the air temperature is lower than 59 or 60 °F, plant growth slows, resulting in slower herbicide uptake and translocation. This slowdown increases the required rainfast period and delays the onset of symptoms. However, overall weed control is not compromised by lower temperatures.

Frost

The impact that a frost will have on glyphosate efficacy depends on the duration of the frost (hours), the severity (low temperatures), the preceding weather and the weed species you're targeting. Generally, perennials, biennials and winter annuals will possess a higher degree of frost tolerance than spring-germinating annuals.

A light frost of 26 to 28 °F will not usually harm a plant. You can resume application later in the day if temperatures are forecast to climb to a minimum of 50 °F for at least two to four hours after the application.

Heavier frost (< 23 °F) can cause more severe damage to most plants, including perennials. Avoid spraying for one to two days after a heavy frost to assess any injury that has occurred. If at least 60% of the plant is still green and actively growing, and daytime temperatures are forecast to reach at least 46 °F, you can resume spraying. Weeds experiencing excess moisture, drought stress, disease or insect pressure will take longer to resume active growth after a frost, so you may need to wait a longer interval to achieve effective weed control.

A frost that occurs soon after an application of glyphosate (within 24 hours on annuals, or within three days on perennials) can also impact control. If only a light frost is predicted, ensure that there will be at least a couple hours of temperatures above 46 °F after application to allow the product to enter the plant. Once the temperature increases the next day, translocation will resume. If a severe frost is predicted immediately following your intended application, you may want to avoid spraying. If the plant is damaged before the product has properly translocated, control may be reduced.

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Table 1. Frost severity and herbicide applications.			
Application	**Frost Severity**	**Spray Interval**	**Comments**
Pre-seed or Post-seed	> 24 °F	Can spray the next day. Need a daytime forecast high of >46 °F for at least 2 hours after the application in order to resume spraying.	Regardless of the severity of the frost, plants need to be actively growing or they won't translocate the herbicide. The target plants must have >60% green tissue for applications to be effective.
	< 23 °F	Wait at least 1 to 2 days to assess damage to plants. Need a daytime forecast high of >46 °F for 2 or more hours after the application in order to resume spraying.	
Roundup WeatherMAX® HERBICIDE	30-Minute rainfast		
Roundup PowerMAX® 3 HERBICIDE	4-hour rainfast		
Roundup PowerMAX® HERBICIDE	4-hour rainfast		

Summary

- The optimal temperature range for spraying glyphosate is 60 to 75 °F.
- A frost of 26 to 32 °F will not usually harm the target weeds, so you can resume spraying later in the day if temperatures are forecast to reach 46 °F or more for at least two hours after application.
- Heavier frost (< 23 °F) can cause more severe damage to target weeds, so avoid spraying for one to two days after the frost to assess any injury. If at least 60% of the plant is still green and actively growing and daytime temperatures are forecast to reach 46 °F or more for at least two hours after application, you can resume spraying.
- Check your glyphosate product label for performance guarantees.

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