

Temperature, Glyphosate Interactions within Roundup Ready Alfalfa.

Liberty Galvin ¹, Brad Hanson ², Steve Orloff ³

University of California, Davis ¹, University of California Cooperative Extension, Weed Specialist ², University of California Cooperative Extension, Siskiyou County ³

The intermountain region of northern California is known for its high-value alfalfa (*Medicago sativa* L.) forage production systems, attributed to cold night time temperatures and short growing season. Many farmers in this region prefer Roundup Ready varieties because of the ease of weed management and subsequent opportunity to maximize forage quality. In 2014 and 2015 crop injury was observed in several fields in Scott Valley, Siskiyou County following early-spring applications of glyphosate. Anecdotal evidence and results of several field experiments suggested a correlation between glyphosate application and the timing of the next frost event. To support the field research, a series of greenhouse trials were conducted at UC-Davis to determine if similar injury symptoms could be recreated under more controlled conditions. Greenhouse trials encompassed several parameters including duration and intensity of frost event, time between frost event and herbicide application, plant height, and stand age. Injury symptoms, including chlorosis, leaf curling and shoot necrosis, have prevailed more frequently with treatments combinations that include frost events, 2 hours of 0°C, occurring within 24 hours of a herbicide application on plants 12” or taller. Damage was not uniform across all replicates in each treatment, and was variable even within the injured plants themselves. Injury occasionally prolonged for several weeks, but ideal greenhouse growing conditions allowed for quick regrowth of curled leaves and chlorotic shoots. Additional research needs to be conducted to better understand the conditions necessary to reproduce injury symptoms, and to determine the underlying physiological causes of crop damage seen in the field.