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**Introduction.** With the development of herbicide resistant crops, attention has been given to maximizing the effectiveness of Roundup and Liberty. The Liberty label states that application should be made between dawn and two hours before sunset to avoid the possibility of reduced control. Recent observations also suggest that Roundup can have reduced control when applied after dusk.

**Objective.** The objectives of this study were to examine the influence of time of day of herbicide application, adjuvant and rate of Roundup Ultra and Liberty on annual weed control.

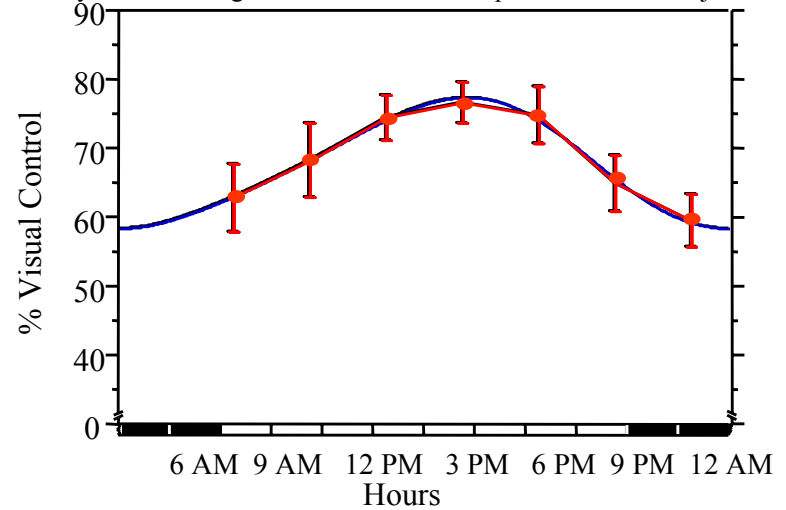
**Materials and Methods.** Field experiments were conducted at Rosemount and Crookston, MN in 1998 and 1999. Spray dates at Rosemount were 6-13-98, 6-30-98, 6-24-99 and 7-21-99. The spray date at Crookston was 6-17-99. Roundup rates were 4 and 16 oz/A and Liberty rates were 10 and 20 oz/A. Each treatment was applied with and without the addition of an adjuvant (Class Act™) at 2.5% v/v. Time of application included: 6 AM, 9 AM, 12 PM, 3 PM, 6 PM, 9 PM and 12 AM. Seven and 14 day visual ratings and biomass were taken to determine percent control.

**Results.** Timing of herbicide application influenced annual weed control with both Roundup Ultra and Liberty. Greatest annual weed control was observed between 9 AM and 6 PM, while significantly less weed control was observed at 6 AM, 9 PM and 12 AM. The addition of an adjuvant or increasing the rate of each herbicide increased effectiveness, but did not overcome the time of day effect.

**Discussion.** The variation in effectiveness over time of day appears to be linked to environmental affects and weed species and heights. Plant physiological factors were not measured, but are assumed to play a role in the time of day of application effect.

**Conclusion.** Consideration should be given to time of day of application of Roundup Ultra and Liberty when controlling a wide variety of weed species, densities and sizes. Serious consideration should be given to avoid early morning and evening hour applications made in cooler environments and on difficult to control or larger weeds.

14 Day Visual Ratings of 16 oz/A of Roundup Ultra Without Adjuvant

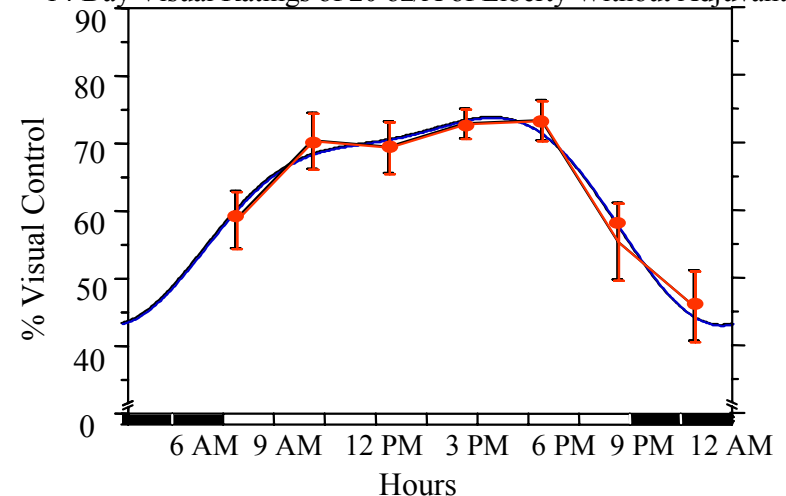


Roundup Ultra 16 oz/A at 3 PM



Roundup Ultra 16 oz/A at 12 AM

14 Day Visual Ratings of 20 oz/A of Liberty Without Adjuvant



Liberty 20 oz/A at 3 PM



Liberty 20 oz/A at 12 AM