

EFFECT OF TIME OF DAY ON THE EFFICACY OF HERBICIDES IN SOYBEAN. Mark M. Loux, Geoffrey D. Trainer, and Anthony F. Dobbels, Associate Professor, Graduate Research Assistant, and Research Associate, Department of Horticulture and Crop Science, The Ohio State University, Columbus, OH 43210.

Field studies were conducted in 2001 and 2002 to determine the effect of the time of day on the efficacy of foliar-applied herbicides in glyphosate-tolerant soybeans and in fallow areas following wheat harvest. In the first soybean study, conducted at South Charleston, OH in 2001 and 2002, and at Custar, OH in 2001, glyphosate, fomesafen, and cloransulam-methyl were applied postemergence in glyphosate-tolerant soybeans at 630, 350, and 13 g/ha, respectively. Treatments were applied at three-hour intervals from 6 am to midnight at South Charleston, and from 6 am to 9 pm at Custar. In the second study, conducted at South Charleston in 2002, treatments were applied at 6 am, noon, and 9 pm, and included the following: glyphosate at 420, 630, and 840 g/ha, three different glyphosate formulations at 840 g/ha, and mixtures of glyphosate at 840 g/ha with cloransulam at 7 and 13 g/ha.

The activity of cloransulam-methyl was not affected by time of application in 2001, but control of giant ragweed in 2002 was reduced by 15 to 20% at 6 and 9 am, compared to later applications. In 2001 at South Charleston, the activity of fomesafen on common ragweed was reduced at 6 am, 9 pm, and 12 am, compared to other applications. A similar trend occurred for giant ragweed at 6 and 12 am. In 2002, fomesafen activity on giant ragweed reached a maximum at 6 pm, and control was significantly reduced at 6, 9, and 12 am. In 2001, the activity of glyphosate on common ragweed was reduced at 6 am, 9 pm, and 12 am at South Charleston, and at 9 pm at Custar. Control of redroot pigweed was reduced at 6 and 12 am, and control of velvetleaf was reduced at 6 am. Control of giant ragweed was significantly reduced only at 6 am in 2002, but there was a trend for reduction in giant ragweed control in the early morning or late evening both years. In 2002, increasing the glyphosate rate from 420 to 840 g/ha improved giant ragweed control at noon and 9 pm, but did not improve control at 6 am. Three different glyphosate formulations were similarly affected by time of application. When glyphosate was applied with 13 g/ha of cloransulam-methyl, control of giant ragweed at 6 am improved from 58% to 78%, while control at noon and 9 pm was not affected and remained at 88 and 81%, respectively.

In the fallow study, treatments were applied at 6 am, 2 pm, and 9 pm, and included glyphosate at 840 and 170 g/ha, and a mixture of glyphosate and 2,4-D ester at 840 and 560 g/ha, respectively. Redroot pigweed, common lambsquarters, and common ragweed were 25 to 50 cm tall at time of treatment, and giant ragweed was up to twice this height. Time of herbicide application did not affect control of common lambsquarters, common ragweed, or redroot pigweed. Glyphosate was less active on giant ragweed when applied at 6 am or 9 pm, compared to 2 pm. The mixture of glyphosate plus 2,4-D controlled 100% of the giant ragweed regardless of time of application.