

TEMPERATURE EFFECTS ON BURNDOWN HERBICIDE EFFICACY. Ryan F. Hasty\*, Christy L. Sprague, and Aaron G. Hager, Graduate Research Assistant, Assistant Professor, and Assistant Professor, University of Illinois, Urbana, IL 61801.

No-till soybean production has experienced considerable growth in recent years and researchers believe that winter annual weeds are becoming more prevalent due to a decrease in the use of residual herbicide. One of the problems with controlling existing vegetation in the spring is making applications in cool weather when weeds are not actively growing. A field experiment was established in Urbana in the spring of 2002 to address the following objectives: 1) determine the effect of air temperature during herbicide application on control of winter annual species, and 2) compare control of winter annual weed species from herbicides with differing speeds of activity. The trial was a randomized complete block design with six applications based on the daytime high air temperature ranging from 8 to 31 C. Herbicide treatments included glyphosate at 0.63 kg ae/ha, paraquat at 0.7 kg/ha, and paraquat plus metribuzin at 0.7 and 0.21 kg/ha respectively. Glyphosate or paraquat provided similar suppression of henbit when application temperatures were below 24 C. Tank-mixing metribuzin with paraquat improved henbit control at application temperatures of 24 C or less compared with paraquat alone. Henbit control from all treatments improved dramatically when application temperatures increased from 24 to 31 C, with paraquat or paraquat plus metribuzin providing significantly greater control than glyphosate. Overall, the effect of temperature was not significant for common chickweed control with glyphosate and paraquat plus metribuzin. However, temperature had a significant effect on paraquat for common chickweed, with common chickweed control increasing with increases in temperature. Similar to henbit control, glyphosate and paraquat were not significantly different when application temperatures ranged from 8 to 18 C with respect to henbit biomass. A dramatic decrease in henbit biomass was observed when glyphosate was applied at 31 C. Overall, paraquat plus metribuzin decreased henbit biomass as application temperatures increased. Across herbicides there were few differences in common chickweed biomass. However, at the 8 and 13 C application timings common chickweed biomass was significantly greater with paraquat compared with glyphosate or paraquat plus metribuzin. These results indicate that cooler temperatures had a significant impact on paraquat activity in controlling common chickweed, while glyphosate and paraquat plus metribuzin were not affected by temperature. Paraquat plus metribuzin provided the most consistent control of henbit and common chickweed across temperatures when comparing the total biomass of the plots. However, when the application temperature reached 31 C all herbicide treatments provided excellent control of these species. Total biomass in the glyphosate and paraquat plots was similar across all temperatures with the exception of 24 C. This indicates that there was very little difference between a contact and translocated, non-selective herbicide for control of these two species. Overall, increases in temperature at the different timings significantly enhanced weed control and reduced weed biomass.