

SIMULATED AUXINIC HERBICIDE TANK CONTAMINATION EFFECTS ON SOYBEAN GROWTH, DEVELOPMENT, AND YIELD. Kevin B. Kelley, Loyd M. Wax, Aaron G. Hager, and Dean E. Riechers, Graduate Research Assistant, Professor Emeritus, and Assistant Professors, Department of Crop Sciences, University of Illinois and USDA-ARS, Urbana, IL 61801.

Several plant growth regulator (PGR) herbicides are used for weed control in corn and wheat production systems. Soybean are very sensitive to PGR herbicides and are often grown next to corn and wheat fields. Symptoms resembling PGR herbicide injury are frequently reported in soybean fields. Soybean may be exposed to PGR herbicides by off-target movement of spray particles, volatilization, or from residues that can be dislodged from application equipment following a previous application to a corn or wheat crop. Previous experiments have shown that simulated drift of PGR herbicides can cause a high level of injury to soybean yet not have as significant of an effect on yield. The current study was initiated to determine if the presence of PGR herbicides with commonly used soybean herbicides (as in the case of PGR herbicide residues dislodged from application equipment) would result in increased crop response and yield effect when compared with the PGR herbicide applied alone at an equivalent rate. In 2002 and 2003, the highest labeled use rates of the herbicides glyphosate, imazethapyr, imazamox, and fomesafen were applied alone and in combination with 1% of a field use rate of dicamba at two vegetative growth stages (V3 and V7) of glyphosate-resistant soybean. Dicamba was also applied alone. Crop injury, plant height, yield, and yield components (seed weight, seeds per pod, pods per plant) were evaluated both years. The rate of dicamba used killed the soybean apical meristem in all treatments, with all subsequent growth occurring from branches. Dicamba-treated soybean were shorter and yielded less than soybean from other treatments. Additionally, at the later application (V7), imazethapyr, imazamox, and fomesafen caused a greater yield reduction when combined with dicamba than did dicamba applied alone. Glyphosate did not significantly affect dicamba-induced yield reductions in either year. The yield component that was most affected at the V7 application was seeds per pod. These results indicate that dicamba can have a greater effect on soybean development and yield if other herbicides are present to cause additional stress to the plant, though the magnitude of response is affected by the herbicide used and the growth stage of the soybean.