SOYBEAN RESPONSE TO SIMULATED SPRAY CONTAMINATION BY HPPD-INHIBITING HERBICIDES. Douglas J. Maxwell, Lisa C. Gonzini, Joshua T. Kunkel, and Aaron G. Hager, Principal Research Specialist, Research Specialists, and Assistant Professor, Department of Crop Sciences, University of Illinois, Urbana, IL 61801.

Herbicides that inhibit the HPPD enzyme have become popular options for postemergence control of annual broadleaf weeds in corn. Broadcast applications of mesotrione or tembotrione can be made to corn up to the 8-leaf stage, while topramazone may be applied up to 45 days prior to harvest. These herbicides are frequently applied in combination with other herbicides, such as atrazine, to broaden the spectrum of weeds controlled. The relatively wide application window increases the probability that soybean may be growing in the vicinity when postemergence applications of these herbicides are made in corn.

Herbicide drift outside the application area can injure sensitive, non-target vegetation. Previous research has demonstrated that soybean injury can occur following exposure to mesotrione at rates simulating drift. Field research was conducted in 2008 to characterize and compare soybean response to the HPPD-inhibiting herbicides mesotrione, topramazone, or tembotrione, applied in combination with atrazine at rates simulating spray drift or contamination.

Herbicide treatments were broadcast postemergence at 20 GPA on weed-free soybean 5 to 6 inches tall. Herbicide application rates corresponded to 1/2, 1/6, 1/18, and 1/54 of 1X field use rates for mseotrione (1X = 0.094 lb ai/A), topramazone (1X = 0.016 lb ai/A), and tembotrione (1X = 0.082 lb ai/A), all plus atrazine (1X = 0.25 lb ai/A). All herbicide treatments included corresponding rates of crop oil concentrate and 28% UAN. Regardless of application rate, all treatments caused visible soybean injury 7 days after treatment (DAT). By 56 DAT, visible soybean injury was still evident from the 1/2 and 1/6 rates of mesotrione and tembotrione and the 1/2 rate of topramazone. Reduced plant heights 56 DAT and delayed maturity corresponded with late-season soybean injury ratings. Soybean yield was reduced by the 1/2, 1/6, and 1/18 rates of tembotrione and the 1/2 and 1/6 rates of mesotrione, but only the 1/2 rate of topramazone.

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