

VARIABILITY OF TEMBOTRIONE EFFICACY AS INFLUENCED BY COMMERCIAL ADJUVANT PRODUCTS. Bryan G. Young, Richard K. Zollinger, and Mark L. Bernards, Associate Professor, Department of Plant, Soil, and Agricultural Systems, Southern Illinois University, Carbondale, IL 62901, Professor, Department of Plant Sciences, North Dakota State University, Fargo, ND 58105-5051, and Assistant Professor, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE 68583-0915.

Tembotrione is a new HPPD-inhibitor herbicide. It is labeled for use in corn and has postemergence activity on many broadleaf and grass weeds. The activity of many postemergence herbicides can be increased by selecting an appropriate adjuvant as a tank-mix partner. Our objectives in this study were to 1) screen common commercial non-ionic surfactants (NIS), crop oil concentrates (COC), methylated seed oils (MSO), and high surfactant oil concentrates (HSOC) to determine if there were differences within adjuvant classes and between adjuvant classes in enhancing the activity of tembotrione, 2) compare a NIS, COC, and MSO adjuvant tank-mixed with the postemergence HPPD-inhibitors tembotrione, mesotrione, and topramezone to determine if the herbicides responded similarly to the adjuvant classes; and 3) compare tembotrione tank-mixed with a NIS, COC, or MSO adjuvant at spray solution pH's of 5.0, 7.0, and 9.0 to determine the effect of pH.

Field experiments were conducted at research facilities associated with North Dakota State University, Southern Illinois University, and the University of Nebraska-Lincoln. Herbicide treatments were broadcast at 10 gpa. Tembotrione (0.0273 lb ai/a), mesotrione (0.0312 lb ai/a), and topramezone (0.00547 lb ai/a) were applied at 1/3 the recommended use rates. The weed species varied by location, and were a minimum of 6-8 inches at the time of application.

The response to adjuvant class (e.g., NIS, COC, MSO, and HSOC) varied by species. There was a wide range of response between adjuvants within each adjuvant category. The general trend between adjuvant categories was $NIS \leq COC = MSO = HSOC$.

Tembotrione, mesotrione, and topramezone responded similarly to the three adjuvant classes. On species where there was a response to adjuvants, phytotoxicity increased in the order of $NIS < COC \leq MSO$.

Weed control activity of tembotrione increased as spray solution pH increased from pH 5 to pH 7. There was little or no response as pH increased from 7 to 9. Weed control activity in response to adjuvant categories was consistent across pH levels, and was again $NIS < COC \leq MSO$.