

HIGH SURFACTANT OIL CONCENTRATES - THE REST OF THE STORY. Richard K. Zollinger, Professor, Department of Plant Sciences, North Dakota State University, Fargo, ND 58108.

Glyphosate is a highly hydrophilic herbicide and require surfactant type adjuvants to enhance phytotoxicity. Many postemergence herbicides applied with glyphosate to increase weed control are lipophilic (clethodim, tembotrione, others) and require oil type adjuvants for optimum weed control. Adjuvant selection when tank-mixing glyphosate and lipophilic herbicides may enhance or antagonize either herbicide. Surfactants are less effective in enhancing lipophilic herbicides and oil adjuvants, including crop oil concentrates (COC) and methylated seed oil (MSO), may antagonize glyphosate. High surfactant oil concentrates (HSOC) were developed to enhance lipophilic herbicides without antagonizing glyphosate. HSOC adjuvants by ASTM definition contain at least 50% w/w oil plus 25 to 50% w/w surfactant. Field trials were conducted in 2009 to compare commercial HSOC adjuvants. Flax, quinoa, tame buckwheat, and corn were planted as assay species. Glyphosate and clethodim were applied alone, and with nonionic surfactant, COC, MSO, an oil based surfactant: Trophy Gold, and the following HSOC adjuvants: Between, Diplomat, Exchange, High Load, Superb HC, Destiny HC, and PX40802. All treatments were applied with and without ammonium sulfate (AMS), and applied perpendicular to assay species. All HSOC adjuvants are not created equal. HSOC adjuvants ranked in order of highest to lowest in activating glyphosate plus clethodim is: Destiny HC>PX40802>Suberb HC=Trophy Gold>Diplomat=Exchange=High Load. Addition of AMS at 8.5 lb/100 gal water enhanced all treatments but relative level of control generally remained similar to treatments applied without AMS. Trophy Gold plus AMS showed a higher increase in control than other treatments with AMS and was similar to Destiny HC for most assay species. PX40802 showed the least response to AMS. Some HSOC adjuvants enhanced weed control from the lipophilic herbicide clethodim and also enhanced broadleaf weed control from glyphosate. Addition of AMS enhances phytotoxicity from all adjuvants applied with glyphosate plus clethodim but does not completely overcome antagonism from oil adjuvants applied with glyphosate.