

**DOES REVERSE OSMOSIS WATER AFFECT GLYPHOSATE EFFICACY?****M. R. Manuchehri****P. A. Dotray****Texas Tech University****Lubbock, TX****T. S. Morris****J. W. Keeling****Texas A&M AgriLife Research****Lubbock, TX****Abstract**

Water is the main carrier used in most herbicide applications. The quality of water may play an important role in the success or failure of herbicide treatments, especially for weak acid herbicides such as imidazolinones, 2,4-D and glyphosate. In an attempt to offset potential antagonism of herbicides due to poor water quality, systems utilizing reverse osmosis (RO), a filtration process to remove dissolved inorganic solids from water, are being considered by some growers in the Texas High Plains. Defining the role of water quality on glyphosate efficacy is important due to its increased use over the past 15 years. The effects of water quality and water conditioning agents on glyphosate efficacy were assessed in six field trials established near Lubbock, TX in 2012 and 2013. The objectives of these studies were to 1) determine if there is a benefit in using RO water, 2) determine if glyphosate efficacy is affected by water carrier source, and 3) determine if the addition of ammonium sulfate will improve glyphosate control when water quality is poor. Test plants included volunteer winter wheat (*Triticum aestivum* L.), Palmer amaranth (*Amaranthus palmeri* S. Wats.), and kochia (*Kochia scoparia* L.). All trials were organized in a randomized complete block design with four replications. Five water sources, ranging in cation concentrations of 519-1046 ppm, were selected from a collection of 23 wells throughout the Texas High Plains. The selected five sources plus a RO water source were used as carriers for the following four herbicide treatments: glyphosate applied alone at 11 and 22 oz/A, and glyphosate applied at 11 and 22 oz/A plus dry ammonium sulfate (AMS) at 17 lbs/100 gal. Injury was recorded at 14, 21, and 28 days after treatment. At the 11 oz/A glyphosate rate, reverse osmosis water increased glyphosate efficacy in one of the six trials. In two of the six trials, differences in glyphosate efficacy were observed among water sources at the 11 oz/A rate. Additionally, an increase in glyphosate rate increased efficacy across trials and the addition of AMS increased efficacy in five of the six trials. Overall, in only one of the six trials and at the low glyphosate rate did RO water appear to positively affect glyphosate efficacy.