ROUNDUP POWERMAX AS INFLUENCED BY WATER QUALITY AND AMMONIUM SULFATE M. R. Manuchehri Texas Tech University Lubbock, TX P. A. Dotray Texas Tech University and Texas A&M AgriLife Research and Extension Center Lubbock, TX T. S. Morris J. W. Keeling Texas A&M AgriLife Research and Extension Center Lubbock, TX

Abstract

The quality of water, the most common carrier used in most herbicide applications, plays a critical role in the success or failure of herbicide treatments, especially for weak acid herbicides such as glyphosate. Defining the role of water quality on glyphosate efficacy is important due to its increased use over the past 15 years. 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 used by some growers in the Texas High Plains. The effects of water quality on glyphosate efficacy were assessed in five field trials established near Lubbock, TX in 2012. 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 arranged in a randomized complete block design with four replications. Five water samples, ranging in cation concentrations of 519-1,046 ppm, were selected from a collection of 23 wells pumped from the Ogallala Aquifer across 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 0.387 and 0.77 lb as A^{-1} and glyphosate applied at 0.387 and 0.77 lb as A^{-1} with dry ammonium sulfate at 17 lbs per 100 gallons of water. Injury was recorded at 14, 21, and 28 days after treatment. In three of the five trials, differences in efficacy due to water source or a water source by glyphosate rate interaction were observed. Additionally, efficacy improved with increasing glyphosate rate and the presence of AMS across trials.