COTTON AND PALMER AMARANTH RESPONSE TO PYROXASULFONE APPLIED EARLY PREPLANT, PREEMERGENCE, AND POSTEMERGENCE-DIRECTED C.J. Webb J.W. Keeling P.A. Dotray Texas A&M AgriLife Research Texas Tech University

<u>Abstract</u>

Palmer amaranth has been the most common annual broadleaf weed in Texas High Plains cotton for many years and has been controlled successfully with a combination of soil residual herbicides, glyphosate, and cultivation. Glyphosate-resistant Palmer amaranth, first identified in this region in 2011, have increased dramatically in recent years. Pyroxasulfone, marketed alone as Zidua or in a pre-mix with carfentrazone-ethyl (Aim) and sold as Anthem Flex, has excellent activity on Palmer amaranth. Previous research suggests that there is potential for cotton injury when these products were applied preemergence, especially in coarse textured soils.

Field studies were conducted in 2014 on different soil textures to evaluate cotton response and Palmer amaranth control following Zidua and Anthem Flex applied early-preplant (EPP), preemergence (PRE), and postemergencedirected (PDIR). Early-preplant and PRE treatments of Zidua (1.5oz/a), Warrant (48oz/a), and Dual Magnum (20oz/a) were applied at Halfway (clay loam soil) and Lamesa (sandy loam soil). Preemergence treatments of Anthem Flex (1.38, 1.84, 2.75, 3.68, 5.54, 7.7oz/a) and Caparol (26, 38oz/a) were applied at Lamesa and Lubbock (loam soil). Postemergence treatments of Zidua (1.27oz/a), Warrant (48oz/a), Anthem Flex (2.76oz/a), Direx (32oz/a), Roundup (22oz/a), and Aim (1.23oz/a) were applied at Lamesa and Lubbock. Treatments were applied using a CO_2 -pressurized backpack sprayer calibrated to deliver 10 gallons per acre. Plots, 4 rows by 30 feet in length, were replicated three times. Cotton injury and Palmer amaranth control was estimated visually based on a standard scale of 0 to 100%, where 0 = no injury and no weed control, and 100 = complete crop loss and complete weed control.

Cotton was injured 20 to 65% following Zidua applied EPP and PRE, and greater injury was observed on course textured soils. Cotton yield was not reduced by any Zidua treatment. Zidua applied EPP and PRE at either location controlled Palmer amaranth 88 to 92% 109 days after planting. Cotton injury from 5 to 30% was observed following Anthem Flex applied PRE at the sandy loam location and greater injury was observed with increased rates at both locations. No injury or yield reduction was observed following Zidua or Anthem Flex applied PDIR and both herbicides provided excellent residual Palmer amaranth control.