EFFICACY OF POST-EMERGENCE HERBICIDES DEPENDING ON SIZE OF PALMER AMARANTH AT APPLICATION Zachary D Lancaster Jason K Norsworthy Chris J Meyer Nicholas R Steppig University of Arkansas Favetteville, AR

<u>Abstract</u>

With the continuous development of herbicide-resistant weeds, especially multiple herbicide-resistant Palmer amaranth (Amaranthus palmeri), new technologies are needed to effectively control these troublesome weeds. Lately, more interest has developed in automated weed control, especially with advancements in spectral recognition and precision herbicide applications. Precision applications of broad spectrum herbicides could be a useful tool to combat herbicide-resistant Palmer amaranth, however, little research has been done at this time to determine the most effective herbicide programs for precision applications. An experiment was conducted in the summer of 2016 at the University of Arkansas Research and Extension Center in Fayetteville, AR and at the Lon Mann Cotton Research Station near Marianna, AR to evaluate efficacy of postemergence herbicides on Palmer amaranth at multiple sizes at time of application. The experiment was set up as a two factor factorial, randomized complete block design, with factor-A being size of Palmer amaranth at time of application, and factor-B being herbicide program applied. Size of Palmer amaranth evaluated were 2, 5, 8, 12, 18, and 24 inches at time of application. Herbicide treatments evaluated were glufosinate at 43 or 72 fl oz/A, paraquat at 78 fl oz/A, paraquat at 78 fl oz/A + pometryn at 32 fl oz/A, and dicamba at 16 or 32 fl oz/A. Overall, paraquat and paraquat + pometryn produced the greatest Palmer amaranth control, over a range of sizes (>92%). Clarity at both a low and high rate produced the least control, with control declining rapidly with increasing Palmer amaranth size. This research shows that Palmar amaranth can be effectively controlled from applications of broad spectrum herbicides even at large sizes (24 in), and supports that precision applications of herbicides could be an effective tool to control herbicide-resistant Palmer amaranth.