INFLUENCE OF PALMER AMARANTH SIZE AND NOZZLE SELECTION ON GLUFOSINATE, DICAMBA, AND 2,4-D COMBINATIONS

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All cotton in the United States is grown in areas with potential to have Palmer amaranth resistant to at least one herbicide site of action. Enlist and XtendFlex cotton provide resistance to herbicides that can be used to control Palmer amaranth. Combining glufosinate and dicamba or 2,4-D has the potential to help mitigate the development of resistance to either herbicide. A two-factor randomized complete block design experiment was conducted to evaluate the benefit of adding glufosinate to applications of 2,4-D or dicamba versus glufosinate, 2,4-D, or dicamba alone and the optimal size of Palmer amaranth at the time of application to achieve the most control from these treatments. The experiment was conducted in two locations, once in Fayetteville, Arkansas and once in Newport, Arkansas. In both locations, plots were 20 by 6 feet and applications were applied at 15 gallons per acre. All applications were made using labeled nozzles for each herbicide. Palmer amaranth control ratings were taken weekly on a scale of 0-100% and live Palmer amaranth counts were taken at the conclusion of the trial. Applications of 2,4-D and dicamba with glufosinate were no different than applications of either auxin alone. When applied alone or with glufosinate, 2,4-D and dicamba outperformed standalone applications of glufosinate. When averaged across herbicide treatment, applications made after Palmer amaranth had surpassed an average height of 2 to 3 inches provided significantly less control. Findings from this research show that applications to control Palmer amaranth must be made before the weed reaches 4 inches in height and the use of 2,4-D or dicamba plus glufosinate provides effective control while minimizing the chance for evolution of resistance; however, dicamba plus glufosinate is an off-label application.