EVALUATION OF PREEMERGENCE HERBICIDES IN PPO-RESISTANT PALMER AMARANTH (AMARANTHUS PALMERI) M.M. Houston J.K. Norsworthy L.T. Barber H.D. Bowman U of A Division of Ag Fayetteville, AR

Abstract

After the confirmation of glyphosate and acetolactate synthase (ALS)-resistant Palmer amaranth (Amaranthus palmeri), protoporphyrinogen oxidase (PPO)-inhibiting herbicides became the standard for controlling multiresistant Palmer amaranth in cotton as preemergence (PRE) and post-directed applications. PPO inhibitors such as flumioxazin and fomesafen became useful as a residual while still offering some foliar activity. Due to extensive use and selection pressure from these herbicides throughout the past 10 years, PPO-resistant Palmer amaranth was identified and confirmed in 2016 across seven states. On-farm field trials were conducted in 2016 and 2017 in both Marion and Crawfordsville, AR to evaluate PRE herbicides for controlling PPO-resistant Palmer amaranth. The herbicides were applied to freshly-tilled plots with rainfall activation of the treatments directly following application. Visual control ratings were taken at 21, 28, and 35 days after PRE (DAP) which were compared back to the untreated check for accurate representation. Seven herbicides were evaluated: fomesafen (.25 lb. ai/A), Smetolachlor (1.24 lb. ai/A), acetochlor (1.125 lb. ai/A), pyroxasulfone (.133 lb. ai/A), diuron (0.75 lb. ai/A), pendimethalin (1.43 lb. ai/A), and dicamba (0.5 lb. ai/A). No herbicide provided effective (85%) control at 21 DAP, however, diuron provided the highest level of control at 82%. At 28 DAP all herbicides lost a significant amount of control with fomesafen providing only 50% control, significantly worse than every other treatment except pendimethalin. At 35 DAP, all herbicides were below 70% control with fomesafen, dicamba, and pendimethalin below 40%. Results indicate PPO and DNA inhibitors (fomesafen and pendimethalin) are ineffective even at the 21 DAP timing. Suggestions for improved control are utilizing multiple modes of action, overlapping residuals every 14 days, coupled with effective POST programs.