Control of Palmer Amaranth with Herbicide Programs in the South Texas Peanut Production Area

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Palmer amaranth (*Amaranthus palmeri* S. Wats.) represents a significant threat to peanut (*Arachis hypogaea* L.) production across Texas. A field trial was conducted in 2021 in a peanut field near Pearsall, TX (28.8649° N; -99.1528° W) to investigate herbicide programs for season-long management of this weed. The trial included fifteen treatments and was arranged as a randomized complete block design with three replications. Treatments included preemergence (PRE) applications of pendimethalin at 1.06 kg ha^{-1} either alone or in combination with flumioxazin (71.5 g ha^{-1}), *S*-metolachlor (1.42 kg ha^{-1}), imazethapyr (25.2 g ha^{-1}), pyroxasulfone + carfentrazone (65.4 + 4.7 g ha^{-1}), dimethenamid-P (0.63 kg ha^{-1}), or acetochlor (1.26 kg ha^{-1}). These were followed by either at-cracking applications of paraquat + pyroxasulfone (0.28 + 0.12 kg ha^{-1}), early postemergence (EPOST) applications of either pyroxasulfone + carfentrazone + 2,4-DB (65.4 + 4.7 g ha^{-1} + 0.45 kg ha^{-1}) or imazapic + 2,4-DB (70.0 g ha^{-1} + 0.45 kg ha^{-1}), or mid postemergence (MPOST) applications of *S*-metolachlor + 2,4-DB (1.42 + 0.45 kg ha^{-1}).

Thirteen days after PRE applications were made, control of Palmer amaranth was highest with tank mixtures of pendimethalin with either flumioxazin, *S*-metolachlor, flumioxazin + *S*-metolachlor, pyroxasulfone + carfentrazone, or dimethenamid-P (99-100% control), versus that of pendimethalin + acetochlor (90%), pendimethalin + imazethapyr (60%), or pendimethalin alone (67 to 78%). Fourteen days after EPOST applications were made, control of Palmer amaranth was greatest with pendimethalin + flumioxazin PRE (91%), pendimethalin + dimethenamid-P (91%), pendimethalin + *S*-metolachlor PRE (92%), and pendimethalin + flumioxazin + *S*-metolachlor PRE (96 to 97). By four weeks after all applications were made, the greatest control of Palmer amaranth was observed with pendimethalin + *S*-metolachlor PRE (80%), pendimethalin PRE followed by pyroxasulfone + carfentrazone + 2,4-DB EPOST (81%), pendimethalin PRE followed by imazapic + 2,4-DB EPOST (84%), pendimethalin + flumioxazin PRE (88%), pendimethalin + flumioxazin + *S*-metolachlor PRE (96%), pendimethalin + *S*-metolachlor PRE followed by *S*-metolachlor + 2,4-DB MPOST (98%), and pendimethalin + flumioxazin + S-metolachlor PRE followed by *S*-metolachlor + 2,4-DB MPOST (98%).