POSTEMERGENCE CONTROL OF PPO-RESISTANT PALMER AMARANTH IN COTTON

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Abstract

Since the discovery of PPO (protoporphyrinogen oxidase) inhibitor-resistant Palmer amaranth (*Amaranthus palmeri*) in Arkansas, it has been observed that some populations of PPO-resistant Palmer amaranth are harder to control with herbicides labeled for postemergence (POST) use in cotton (*Gossypium hirsutum*). To determine if herbicides commonly used postemergence in cotton were still viable control options for PPO-resistant Palmer amaranth, a non-irrigated field experiment was conducted in Marion and Crawfordsville, AR in 2018. The experiment evaluated the efficacy of Xtendimax, Enlist One, and Liberty applied in combination with three residual chloroacetamide herbicides commonly used POST in cotton. Treatments were applied to non-crop plots containing 3- to 4-in Palmer amaranth at Marion and 4- to 5-in Palmer amaranth at Crawfordsville. Both locations were arranged as a randomized complete block with four replications. Visible Palmer amaranth control was rated at 2 and 4 weeks after treatment (WAT) and Palmer amaranth density m^{-2} at 4 WAT was measured by counting surviving Palmer amaranth in two 0.5 m^{-2} quadrats. In addition to analysis of variance, orthogonal contrasts were conducted to determine if adding a chloroacetamide herbicide to any treatment affected Palmer amaranth control or density. Applications were made late in the day at Crawfordsville, which likely caused an overall reduction in Palmer amaranth control, especially with Liberty, compared to Enlist One and Xtendimax. At Marion, treatments were applied mid-day and greater control with all treatments was observed. All treatments except Enlist One, Enlist One + Warrant, and Liberty + Warrant provided greater than 90% Palmer amaranth control 4 WAT. At Crawfordsville, treatments containing Xtendimax generally provided greater control and reduced densities of Palmer amaranth 4 WAT than Enlist One or Liberty treatments. Results of contrasts showed that there was no benefit to adding a chloroacetamide herbicide to any of the foliar-active herbicides tested. Very little rainfall occurred during this study, preventing further Palmer amaranth emergence and likely eliminating the factor of residual herbicide.