

ACTIVATION AND LENGTH OF RESIDUAL HERBICIDES UNDER SPRINKLER IRRIGATION

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Abstract

Palmer amaranth has evolved wide-spread resistance to glyphosate- and acetolactate synthase (ALS) –inhibiting herbicides in the Midsouth. Because of absence of effective over-the-top postemergence options, season-long activity of residual herbicides is needed to control glyphosate- and ALS-resistant Palmer amaranth. However, adequate soil moisture is needed to activate residual herbicides. Studies were conducted to determine activation and length of residual herbicides applied at labeled rates for a clay soil in corn, cotton, or soybean for the control of Palmer amaranth under sprinkler irrigation at Keiser, AR, in 2011 and 2012.

Small reduction in Palmer amaranth control on beds compared to furrow was observed at 2 (97 vs 99%, respectively) and 3 (95 vs 99%, respectively) weeks after treatment (WAT), but no difference in control was observed at 6 WAT (92 vs 93%, respectively). The subtle difference in control at 2 and 3 WAT may be attributed to greater moisture being retained in furrows. Palmer amaranth control with all herbicides, except Cotoran (89%) at 2 WAT was >90%. Palmer amaranth control with all herbicides at 3 WAT remained similar to 2 WAT, except decrease in control with Envoke (84 vs 97%). By 6 WAT, only AAtrex, Callisto, and Sencor controlled Palmer amaranth similar to 2 WAT. Palmer amaranth control with all other herbicides at 6 WAT was less than at 2 WAT, but control with AAtrex, Callisto, Sencor, Dual, Zidua, Valor, Outlook, and Warrant was $\geq 90\%$, out of which, Dual Magnum, Valor, and Warrant were only cotton herbicides. However, as 90% control is not sufficient for glyphosate-resistant Palmer amaranth, residual herbicides should be applied every 2 to 3 weeks from planting through crop canopy formation (layby) to overlay residual control and minimize the number of Palmer amaranth escapes that must be removed either chemically (when possible), mechanically, or manually.