INFLUENCE OF RAINFALL ON ACTIVATION OF RESIDUAL COTTON HERBICDES FOR CONTROLLING PALMER AMARANTH

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Abstract

Activation of residual herbicides is essential for effective management of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in cotton. Residual herbicides in cotton can be applied in the burndown program prior to planting the crop, preemergence, postemergence over-the-top, and as a layby directed application. The effectiveness of residual herbicides differs among available herbicides as well as the ease of activation. Research was conducted to determine the influence of rainfall amount and timing on activation of residual herbicides in cotton applied for Palmer amaranth control. Eight herbicides were evaluated for residual control of Palmer amaranth at 14 days after applying the herbicides, with rainfall amounts of 0.25, 0.5, 1 inch occurring immediately following application. Additionally, a sub-irrigated treatment, simulating the application of herbicide to the top of a bed followed by furrow irrigation was included. The herbicides evaluated were Dual Magnum at 1.3 pt/A, Direx at 1 pt/A, Cotoran at 1 qt/A, Prow H20 at 2.1 pt/A, Staple LX at 2.6 fl oz/A, Envoke at 0.15 oz/A, Reflex at 1 pt/A, and Valor at 2 fl oz/A along with a nontreated control. In a second experiment, a silt loam soil was over-head irrigated daily at 0, 1, 4, 7, 14, and 21 days after applying each herbicide. Palmer amaranth stand counts were then taken 14 days after activating the herbicides. At least 0.5 inches of rainfall were needed to fully activate Direx, Dual Magnum, Prowl H20, Staple, and Envoke. Sub-irrigation (simulating water wicking to the top of a bed) was not as effective as rainfall in activating Cotoran, Direx, Staple LX, or Envoke. Reflex and Valor were the easiest herbicides to activate, supplying complete control regardless of irrigation amount or use of sub-irrigation. To maximize the activity of Cotoran, Direx, Prowl H20, and Valor, rainfall was needed within 14 days after application. For Staple LX and Envoke, rainfall was needed within 7 days to maximize activity on Palmer amaranth.