

COMPARISON OF PROWL FORMULATIONS FOR USE IN COTTON

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Abstract

Roundup Ready cotton (*Gossypium hirsutum*) has been planted on more than 80% of the cotton acres in Mississippi over the last 3 years. With the introduction of Roundup Ready cotton more weed control options are available as topical applications. Glyphosate can be applied topically until cotton reaches the fourth leaf stage. For this reason, preemergence residual treatments have decreased due to the efficiency of early post treatments. In order to maximize the use of residual herbicides in the Roundup Ready system, cotton tolerance and herbicidal efficacy must be determined when applied postemergence with glyphosate. Prowl H₂O is an encapsulated formulation of pendimethalin that is water based. It does not stain as bad as the former Prowl 3.3 EC and has a decreased rate of photodegradation. The purpose of this study was to evaluate Prowl H₂O and other preemergence residual herbicides such as Dual II Magnum (metolachlor) and Outlook (dimethenamid) in terms of crop safety and weed control when tank-mixed with glyphosate and applied postemergence over cotton.

Research was conducted in 2003 at the Blackbelt Research Station near Brooksville, MS on a silty clay loam, and at Starkville, MS on a silt loam. Stoneville 4892 BR was planted at both locations and experimental units were 12.6 by 40 feet. Herbicide treatments were arranged in a two factor factorial. Herbicide timing was the first factor composed of a preemergence and two postemergence timings with 0.75lb ae/A glyphosate. The second factor was composed of 6 residual herbicide treatments. These treatments consisted of; Prowl (pendimethalin) 3.3 EC at 1.0 and 2.0 lb ai/A, Prowl H₂O (pendimethalin) at 1.0 and 2.0 lb ai/A, Dual II Magnum at 1.25 lb ai/A and Outlook at 0.75 lb ai/A. All herbicides were applied at 15 gallons per acre (GPA). Data evaluated consisted of cotton injury, large crabgrass (*Digitaria sanguinalis*) control, and pitted morningglory (*Ipomoea lacunosa*) control. Visual ratings for cotton injury and weed control were taken 7 days after early post applications, 14 days after late post applications and 28 days after late post applications. Cotton yield data were collected on the center two rows of each plot. Data were pooled across locations, subjected to analysis of variance, and means separated by least significant difference at the 0.05 level of significance (LSD_{0.05}).

Prowl 3.3 EC at 2.0lb ai/A and Outlook at 0.75lb ai/A resulted in 30% cotton injury 7 and 14 DAT (days after treatment) when applied preemergence. Prowl H₂O at 2.0lb ai/A only injured cotton 6% at 28DAT and Prowl H₂O at 1.0 lb ai/A gave less than 6% injury at all rating periods when applied preemergence. Postemergence applications of these compounds resulted in less than 10% injury when tank-mixed with Roundup Weathermax at 0.75lb ae/A and applied over 1 leaf cotton. Four leaf applications of Prowl 3.3 EC at 2.0lb ai/A increased cotton injury to 20%. Prowl H₂O, Dual II Magnum and Outlook injured cotton less than 10% when applied with Roundup Weathermax over 4 leaf cotton. Large crabgrass control was 75% at 28 DAT with Roundup Weathermax applied alone. Large crabgrass control was increased to 91% at 28 DAT with all residual herbicides applied. Preemergence applications of Outlook, Dual II Magnum and Prowl increased pitted morningglory control to 89, 85 and 87% respectively at 7 DAT over Roundup Weathermax applied alone. Residual herbicides did not improve control of pitted morningglory when tank-mixed with Roundup Weathermax and applied post on 1 leaf cotton. However Dual II Magnum, Outlook and Prowl did increase control over Roundup Weathermax alone, when applied at 4 leaf cotton. The results of this study indicate that these residual herbicides can be applied post emergence with minimal injury to cotton. Prowl H₂O provided equivalent control with less cotton injury than Prowl 3.3EC, when applied PRE at equivalent rates. Post-emergence applications of these residual herbicides could have a fit in a Roundup Ready system during wet years, or a system that lacks in grass control such as BXN or Liberty Link cotton varieties. Further research is needed, however, to fully understand crop tolerance.