

WEED CONTROL PROGRAMS IN ROUNDUP READY FLEX AND LIBERTY LINK COTTON

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Abstract

The need for a wider topical application window in transgenic cotton has facilitated the development of Roundup Ready Flex and Liberty Link Cotton. The Roundup Ready Flex system allows foliar applications of glyphosate (Roundup WeatherMax) through the 12th node, and the Liberty Link system allows for foliar applications of glufosinate (Ignite) up to 70 days prior to harvest. The objective of this research was to compare the efficacy of current Roundup Ready systems to potential weed control programs in both the Roundup Ready Flex and Liberty Link systems.

Field trials were conducted to evaluate the Roundup Ready Flex programs at the Black Belt Experiment Station in Brooksville, MS, the North Mississippi Research and Extension Center in Verona, MS, and the Plant Science Research Center in Starkville, MS. An experiment with Liberty Link cotton was also conducted at the Brooksville location. The experimental design for all experiments was a randomized complete block design with four replications. Plot size was 13 by 40 ft. Foliar applications of glyphosate at 0.75, 1.125, and 1.5 lb ae/A were applied on 1-3, 3-4, 5-8, and 10-12 leaf cotton as well as on 2-3" and 3-5" weeds. Foliar applications of glufosinate were applied at 0.41 lbs ai/A at the 4 leaf stage followed by a sequential application at the 6 leaf stage in cotton. An untreated check was included in the treatments for comparison. In both weed control systems, visual ratings were observed on pitted morningglory (*Ipomoea lacunosa*), sicklepod (*Senna obtusifolia*), hemp sesbania (*Sesbania exaltata*), and annual grasses (*Digitaria sanguinalis*, *Bracharia platyphylla*, and *Eleusine indica*). Ratings were recorded 7 days after treatment (DAT) within the application period and 7, 14, 21, & 28 days-after-final application.

In the Roundup Ready Flex system, pitted morningglory control ranged from 91 to 97% at 7 days after application of the layby treatments. Treatments receiving only glyphosate at layby exhibited 91 to 92% control compared to treatments that included the use of 0.5 lb ai/A diuron which resulted in 97 to 98% control. By 14 DAT, control did not differ among treatments and ranged from 92 to 95%. Sicklepod control 7 DAT was slightly better with treatments containing diuron but all treatments provided 93 to 98% control. By 28 DAT control did not differ among treatments and ranged from 90 to 94%. Hemp sesbania control 14 and 28 DAT ranged from 96 to 99% and did not differ among treatments. The annual grass complex control did not differ among rates or rating interval was at least 99% for all treatments. No cotton injury was observed from any treatment combination.

In the Liberty Link system, pitted morningglory, sicklepod, and hemp sesbania control did not differ among treatments or evaluation interval and ranged from 95 to 99%. Large crabgrass control did vary among treatments. Seven days after the early postemergence application, all treatments provided 95 to 97% control. By 14 DAT, control in treatments that did not include a residual herbicide ranged from 69 to 76% as compared to treatments that included 1.5 lbs ai/A of fluometuron as a preemergence treatment, which provided 87 to 92% control. Following the second topical application, control did not differ among treatments; however by 28 DAT only treatments containing fluometuron or treatments that consisted of three topical applications of glufosinate provided greater than 90% control. Barnyardgrass control was slightly less than for crabgrass yet the trends were similar. By 14 DAT of the first topical application treatments that did not contain a residual provided 73 to 76% control as compared to 89 to 92% with treatments that had 1.5 lbs ai/A of fluometuron applied preemergence. No crop injury was observed with any treatment combination.