

WEED MANAGEMENT IN LIBERTY LINK AND ROUNDUP READY FLEX COTTON

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Abstract

An experiment was conducted at Goldsboro, NC and Attapugus, GA in 2003 to compare glufosinate-based weed management systems in Liberty Link cotton with glyphosate-based systems in Roundup Ready Flex cotton. The objective was to compare the systems under conditions and with application timings that would be expected to produce good weed control. The experimental design was a split-plot, with whole plots being a Liberty Link cultivar (FM958LL in NC, FM966LL in GA) and a non-commercial line of Roundup Ready Flex cotton treated with the base herbicides glufosinate and glyphosate, respectively. Ignite (glufosinate) and Roundup WeatherMax (glyphosate) were applied at 32 and 22 fl oz/A, respectively. Subplots consisted of six herbicide systems and a non-treated check. The six herbicide systems consisted of the following: the base herbicide applied overtop three times; the base herbicide applied overtop twice followed by Direx plus MSMA (2 + 2.4 pt/A) directed; the base herbicide applied overtop twice followed by a directed application of the base herbicide; the base herbicide mixed with either Dual Magnum at 1 pt/A or Staple at 0.8 oz/A applied overtop followed by the base herbicide alone overtop and the base herbicide directed; and Prowl preemergence at 1.8 pt/A followed by the base herbicide overtop twice and then directed. Cotton at the three overtop applications was in the 1- to 2-leaf, 6- to 8-leaf, and 12- to 13-leaf growth stages, respectively. Cotton had 13 to 15 leaves when directed applications were made. In most cases, the weeds were 3 inches tall or less at each application. The NC location had a mixture of annual grasses (goosegrass, broadleaf signalgrass, fall panicum, and large crabgrass), Palmer amaranth, sicklepod, common lambsquarters, and a mixture of morningglory species (tall and pitted morningglory) at densities of 58, 76, 2, 7, and 3 plants per square yard, respectively. The GA locations had bristly starbur, sicklepod, Florida beggarweed, smallflower morningglory, and Texas panicum at densities of 4, 2, 7, 3, and 12 plants per square yard, respectively.

No crop injury was observed with Ignite or Roundup applied alone. About 10% injury was noted from mixtures with Dual or Staple. The cotton recovered quickly, with no injury noted by 3 to 4 weeks. In Georgia, all systems controlled all species 95 to 99% and 99% at 14 days after the first POST and second POST application, respectively. Late-season control was 92 to 99%. The only difference among treatments was with smallflower morningglory control late in the season. Control by Ignite and Roundup was similar, but systems where the third application of Ignite or Roundup was made overtop had less control than systems where the third application was directed. This was likely due to differences in spray coverage in the larger cotton. No differences in cotton yield were noted among the herbicide systems.

In NC, no differences were noted among treatments for lambsquarters or sicklepod control. All treatments controlled these weeds 92 to 100%, 95 to 100%, and 99 to 100% 18 days after the first POST application, 18 days after the second POST application, and late in the season, respectively. Morningglory was controlled similarly by Ignite and Roundup. At 18 days after the first POST, the system without Prowl controlled morningglory 95% compared with 99 to 100% by systems containing Prowl. No differences were noted following the second POST application or late in the season. Prowl increased annual grass control at all evaluations, and Dual and Staple increased control prior to the third application but not late in the season. Annual grasses were controlled similarly by Ignite and Roundup. Roundup was more effective on Palmer amaranth than Ignite; the greatest difference was noted late in the season, where control averaged over systems was 86% with Ignite and 100% with Roundup. Dual and Staple increased Palmer amaranth control 11 to 12% and Prowl increased control 20%. However, control was sufficient in all systems to avoid significant competition. No differences in yield were noted among the herbicide systems.

The excellent weed control in this study and the general lack of differences in control by Ignite and Roundup were attributed to very timely herbicide application. If weeds had been larger when treated, one would have expected better morningglory control by Ignite but better annual grass and Palmer amaranth control by Roundup.