

**EFFECT OF LIBERTY RATE AND APPLICATION STRUCTURE ON WEED CONTROL IN COTTON**

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**Abstract**

With the continuous spread of herbicide-resistant weeds across the Midsouth, especially glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*), alternate herbicidal modes of action are being utilized for postemergence control. Glufosinate has proven to be effective in controlling glyphosate-resistant Palmer amaranth in a LibertyLink® cropping system, with sequential applications of glufosinate proving to be more effective than single applications. Thus, an experiment was conducted in the summer of 2016 at the Northeast Research and Extension Center in Keiser, AR to determine the effect of sequential application timing and use rates on weed control in glufosinate-resistant cotton. The experiment was set up as a single factor, randomized complete block design with the factor being herbicide program. Treatments were applied to glufosinate-resistant cotton crop with applications at early postemergence (EPOST – 3 in weeds), mid-postemergence MPOST – 14 to 21 days after EPOST or 6-8 in weeds), and late postemergence (LPOST - 14 to 21 days after MPOST). 8 total treatments, including untreated check, include Cotoran preemergence at 1 qt/A. Treatments were designed to represent full-season herbicide programs, with combinations of Liberty at 32, 36, and 43 fl oz/A, Dual Magnum at 1 pt/A, and Roundup Powermax at 32 fl oz/A being applied at different application timings. Data were collected on Palmer amaranth and broadleaf signalgrass (*Urochloa platyphylla*) control at 14 and 21 days after pre-plant, early-post, and mid-post application timings. Greatest Palmer amaranth control occurred with programs containing the highest rate of Liberty. Generally, Liberty rate appears to be more important than initial application timing for Palmer amaranth control in a LibertyLink cotton program, with no differences between similar herbicide treatments across application timing. All programs provided excellent full-season control of broadleaf signalgrass in LibertyLink cotton.