

## WEED MANAGEMENT WITH LIBERTY LINK COTTON IN THE SOUTHEASTERN UNITED STATES

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### Abstract

Liberty Link cotton, resistant to Liberty (glufosinate) applied topically, is nearing commercialization. This technology offers growers a larger window for topical and sloppy directed applications of the non-selective herbicide Liberty as compared to Roundup Ready programs. Experiments were conducted throughout the Southeast to evaluate Liberty Link cotton tolerance to Liberty and the effectiveness of Liberty herbicide systems on numerous weed species.

Experiments were conducted at two locations in Goldsboro, NC; in Barnwell and Horry Counties, SC; and in Tifton, GA. Herbicides systems at all locations included the following: 1) Liberty topical to 4- and 10-leaf cotton, 2) Prowl (pendimethalin) or Treflan (trifluralin) applied at planting followed by Liberty topical to 4- and 10-leaf cotton, 3) Prowl or Treflan plus Cotoran (fluometuron) preemergence followed by Liberty topical to 4- and 10-leaf cotton, 4) Prowl or Treflan at planting followed by Liberty topical to 4-leaf cotton and Liberty plus Dual Magnum (*S*-metolachlor) topical to 10-leaf cotton, 5) Prowl or Treflan at planting followed by Liberty topical to 4- and 10-leaf cotton followed by Liberty directed to 15-leaf cotton, and 6) a non-treated control. Additional treatments included Cotoran PRE followed by Liberty topical to 4- and 10-leaf cotton at four of five locations, Prowl PRE followed by Liberty topical to 4- and 10-leaf cotton followed by Caparol (prometryn) plus MSMA directed to 15-leaf cotton at three of five locations, and Prowl or Treflan at planting followed by Liberty topical to 4-leaf cotton and Liberty plus Staple (pyrithiobac) topical to 10-leaf cotton at two of five locations. Soil-applied herbicide rates were based on soil types. Liberty was applied at 27 fl oz/A except when in combination with 1 pt of Dual Magnum or 0.6 oz of Staple, where the Liberty rate was reduced to 24 oz/A. Caparol and MSMA were applied at 2 pt/A each. Testing agreements required the cotton to be destroyed without harvesting.

Liberty applied alone did not visibly injure Liberty Link cotton. Dual mixed with Liberty injured cotton 7 to 9% 1 week after application at two of five locations while Staple mixed with Liberty injured cotton 15 to 31% at two of two locations. No injury was observed with either treatment 3 weeks after application.

Late-season control of carpetweed (*Mollugo verticillata*), cutleaf groundcherry (*Physalis angulata*), Florida beggarweed (*Desmodium tortuosum*), mixtures of ivyleaf (*Ipomoea hederacea*) and entireleaf morningglory (*Ipomoea hederacea* var. *integriuscula*), pitted morningglory (*Ipomoea lacunosa*), seedling johnsongrass (*Sorghum halepense*), sicklepod (*Senna obtusifolia*), smallflower morningglory (*Jacquemontia taminifolia*), smooth pigweed (*Amaranthus hybridus*), and Texas panicum (*Panicum texanum*) was at least 91% and was similar by all herbicide systems. Goosegrass (*Eleusine indica*) control by all herbicide systems also was similar and was at least 87%. Differences in herbicide systems were noted for common cocklebur (*Xanthium strumarium*), Florida pusley (*Richardia scabra*), Palmer amaranth (*Amaranthus palmeri*), southern crabgrass (*Digitaria ciliaris*), and yellow nutsedge (*Cyperus esculentus*).

The total POST Liberty system (two over-the-top applications) controlled Palmer amaranth, southern crabgrass, and Florida pusley 90, 78, and 12%, respectively, at late-season. Use of a soil-applied herbicide(s) improved control of these weeds at least 9, 22, and 82%, respectively. Yellow nutsedge was controlled 67 to 68% by the total POST Liberty system or Liberty following Prowl or Treflan at planting. A third application of Liberty, applied as a directed spray, did not statistically improve control (78%). However, greater than 96% yellow nutsedge control was noted in systems containing Cotoran PRE or Dual Magnum plus Liberty applied topical to 10-leaf cotton. Common cocklebur emerged throughout the season, and programs including Cotoran PRE or layby applications controlled cocklebur at least 90% late in the season. Systems without Cotoran or a layby application controlled common cocklebur 80 to 83%.