

## **Herbicide Resistance Impacting Cotton Production**

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Herbicide resistance is an increasingly serious problem facing growers and those who advise growers. Much of the emphasis is currently focused on glyphosate resistance because of wide-spread adoption of Roundup Ready technology and conservation tillage. Currently, glyphosate resistance has been documented in nine weeds present in the United States including: common ragweed, common waterhemp, giant ragweed, hairy fleabane, horseweed, Italian ryegrass, johnsongrass, Palmer amaranth, and rigid ryegrass.

Glyphosate resistance in Palmer amaranth is a particularly serious threat to cotton production. Acceptable control of glyphosate-resistant Palmer amaranth in cotton requires effective use of preplant or preemergence herbicides, hence control is unpredictable in production areas without irrigation to ensure timely activation of these herbicides. If glyphosate-resistant Palmer amaranth escapes at plant residual herbicides in either glyphosate-resistant or non-transgenic cotton, early season POST options are limited primarily to Staple LX. Cotoran plus MSMA can be applied POST-directed to small cotton, but the height differential necessary for directed application is rarely achieved because of the rapid growth rate of Palmer amaranth. Cotoran and MSMA can be applied POST to cotton, but these herbicides applied in this manner often adversely affect yield and maturity of cotton and do not adequately control Palmer amaranth at rates suitable for topical application. Palmer amaranth resistant to Staple LX has been documented throughout the U.S. Cotton Belt, and Palmer amaranth resistant to both glyphosate and Staple has been confirmed in Georgia.

Preventative weed management programs that delay arrival of this resistant pest into non-infested fields, along with aggressive management programs in fields currently infested, will be critical for sustainable production of glyphosate-resistant cotton. In fields with severe infestations, weed management programs relying exclusively on herbicides are often not effective, especially in dryland production areas. Cotton growers with severe infestations are often being forced to utilize hand removal, cultivation, incorporated dinitroaniline herbicides, deep turning land, growing cultivars with tolerance to glufosinate, or growing other crops that provide greater weed management options.

Although resistant Palmer amaranth continues to spread at an alarming rate, growers have become more aggressive in their management programs. It is hopeful that the adoption of more forceful and proactive programs will reduce the rate of spread and begin to slowly reduce the number of resistant seeds present in the soil seedbanks of heavily infested fields.