

DUAL/GLYPHOSATE COMBINATIONS IN ROUNDUP READY COTTON

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Abstract

Roundup Ready cotton is planted on about 75% of the acreage in the southeastern United States. Growers have reduced or eliminated use of soil-applied herbicides in Roundup Ready systems, and they are now looking for something to tank mix with glyphosate applied over-the-top to provide residual control. Growers have been particularly interested in mixing Dual Magnum (S-metolachlor) with glyphosate.

Experiments were conducted at multiple locations in North Carolina and Georgia to determine cotton tolerance to tank mixes of Dual Magnum and glyphosate applied over-the-top of Roundup Ready cotton and to determine potential weed control benefits from the combination. In three experiments in weed-free cotton, Roundup UltraMax (glyphosate) or Touchdown (glyphosate) were applied alone to 4-leaf cotton or mixed with Dual Magnum at 1 pint per acre. Cotton in North Carolina was injured 5% or less 1 week after application. Injury was expressed as necrotic speckling on leaves contacted by the spray solution. Later emerging leaves were unaffected. Cotton in Georgia was injured up to 20% 1 week after application. The level of injury in Georgia was greater than typically seen with these combinations, and it appeared to be related to application under extremely high humidities. At two of three locations, greater injury was noted with Touchdown plus Dual than with Roundup UltraMax plus Dual. In all studies, no injury was noted 3 weeks after application. Dual Magnum mixed with either formulation of glyphosate had no effect on cotton yield or fiber quality.

In studies designed to evaluate weed control, Roundup Ultra (glyphosate) or Roundup UltraMax was applied otop of 1- to 2-leaf cotton and again to 4-leaf cotton. The glyphosate formulations were applied alone or mixed with Dual Magnum at 1 pint per acre at either the 1- to 2-leaf or 4-leaf stages. All plots received a lay-by application of Caparol (prometryn) plus MSMA. Cotton was injured 5% or less 1 week after application at all locations, and no injury was observed 3 weeks after application. Late-season control of annual grasses, primarily large crabgrass (*Digitaria sanguinalis*), broadleaf signalgrass (*Bracharia platyphylla*), and Texas panicum (*Panicum texanum*), was increased by Dual Magnum at 2 of 6 locations, where late-season control of the grasses was less than 90% by Roundup alone plus the lay-by treatment. Roundup alone plus the lay-by treatment controlled smooth pigweed (*Amaranthus hybridus*) completely late in the season at 5 of the 6 locations. Hence, there was no benefit from Dual Magnum. Palmer amaranth (*Amaranthus palmerii*) at the sixth location was controlled 89% by Roundup alone plus the lay-by. Adding Dual with Roundup applied at either the 1- to 2-leaf or 4-leaf stage increased late-season control to 99%. Dual Magnum had no impact on cotton yield at five locations. At the sixth location, Dual Magnum applied at either application timing increased cotton yield 12%.

In a separate experiment at three locations, the effect of Dual Magnum on weed control was determined in systems with a timely versus a delayed lay-by herbicide application. Touchdown was applied over-the-top of 1-leaf and 4-leaf cotton and later as a lay-by application. Dual Magnum at 1 pint per acre was mixed with Touchdown on 4-leaf cotton. The lay-by application was either made timely or was delayed 11 to 23 days, depending upon location. At two of the three locations, weed emergence following the second otop application was limited, and few significant differences in control were noted due to Dual Magnum. There was, however, a trend for more response to Dual Magnum when the lay-by was delayed. At the third location, little response to Dual Magnum was noted when the lay-by was timely. However, Dual Magnum caused marked increases in late-season Palmer amaranth and Texas panicum control when the lay-by application was delayed. Dual Magnum had no effect on cotton yield when the lay-by was applied timely, but increased cotton yield 53% when the lay-by was delayed. The results indicated Dual Magnum applied otop may be more beneficial when lay-by applications are delayed.