

**ROUNDUP (GLYPHOSATE)/MSMA MIXTURES
IN ROUNDUP READY (GLYPHOSATE-
TOLERANT) COTTON**

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Abstract

Nutsedge (*Cyperus* spp.) is one of the most troublesome and common weeds infesting cotton throughout the Southeast. With the rapid adoption of Roundup Ready cotton, nutsedge can be controlled effectively early season by applying Roundup; however, multiple applications of Roundup are often needed. Although two applications of Roundup may be applied overtop of Roundup Ready cotton prior to the fifth leaf, growers are often limited to a single over-the-top application of Roundup because of operation size and labor and time constraints. With only a single application of Roundup, nutsedge is usually only suppressed. Growers also have the option of using MSMA (Buena 6) overtop of cotton for nutsedge control in several southeastern states. Due to the potential for cotton injury, MSMA at rates registered for over-the-top application to cotton only suppress nutsedge. Since neither a single application of Roundup nor MSMA applied overtop of Roundup Ready cotton adequately controls nutsedge, tank mixtures of Roundup and MSMA may be more effective than each herbicide applied alone. Therefore, field and greenhouse studies were conducted in Georgia and North Carolina to compare nutsedge control by Roundup/MSMA mixtures to Roundup and MSMA applied alone.

Deltapine 458 BG/RR cotton was planted in fields historically infested by yellow nutsedge (*Cyperus esculentus*). Greenhouse studies consisted of planting both yellow and purple (*Cyperus rotundus*) nutsedge in 6-inch diameter pots. Field and greenhouse treatments were arranged factorially including five rates of Roundup (0, 0.25, 0.5, 0.75, and 1.0 lb ai/A) and four rates of MSMA (0, 0.5, 1.0, and 2.0 lb ai/A).

Roundup applied at 0.5, 0.75, and 1.0 lb/A controlled purple nutsedge 11 to 16% more effectively than yellow nutsedge. In contrast, MSMA controlled yellow nutsedge 12 to 13% greater than purple nutsedge. Adding MSMA at 0.5 lb/A

with Roundup was of little benefit for controlling yellow or purple nutsedge. However, adding MSMA at 1.0 lb/A to Roundup increased yellow nutsedge control at least 9% when control by Roundup alone was less than 82%. Purple nutsedge was less responsive to the addition of MSMA at 1.0 lb/A to Roundup. Differing responses of yellow and purple nutsedge to MSMA in mixture with Roundup may be due to Roundup being more effective on purple nutsedge compared to yellow nutsedge, thereby reducing the potential benefit from the tank mix on purple nutsedge, and due to yellow nutsedge being more susceptible to MSMA than purple nutsedge. MSMA at 2.0 lb/A controlled yellow nutsedge 82 to 92% and mixtures of Roundup plus MSMA were no more effective than MSMA applied alone. When purple nutsedge was controlled less than 82% by Roundup alone, adding MSMA at 2.0 lb/A increased control at least 12%.

Roundup applied alone did not injure cotton. MSMA injured cotton 5, 12, and 25% when applied at 0.5, 1.0, and 2.0 lb/A, respectively. Increasing the rate of Roundup in the Roundup/MSMA tank mixtures increased cotton injury. For example, 0.75 to 1.0 lb/A of Roundup in mixture with MSMA injured cotton 8 to 15% more than MSMA applied alone at each rate.

Roundup/MSMA tank mixtures tended to be more effective than either herbicide applied alone when nutsedge was controlled less than 82%. However, regardless of the tank mix, a mid- to late-postemergence directed application of MSMA or Roundup was necessary for adequate control in fields heavily infested with nutsedge. Additionally, greater cotton injury was noted with tank mixtures of Roundup/MSMA when Roundup was applied at 0.75 to 1.0 lb/A.