

**CONTROLLING NUTSEDGE WITH GLYPHOSATE/MSMA
COMBINATIONS IN ROUNDUP READY COTTON**

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Abstract

Convenience in weed control has been the driving force behind the adoption of Roundup Ready cotton in Georgia. Over 80% of the acreage was planted in Roundup Ready cotton in 2001. Glyphosate (Roundup, others) is effective on many annual and perennial weeds, but nutsedge (*Cyperus* species) is difficult to control and is one of the most common and troublesome weeds infesting cotton. Because nutsedge can be very competitive with cotton in the early growth stages, control is important so as not to reduce yields. There are several herbicides available for controlling nutsedge, such as Zorial and Staple. Because of costs and convenience, farmers prefer to use glyphosate only. However, two or three applications are often required for adequate nutsedge control. Glyphosate may be applied twice over the top of Roundup Ready cotton prior to the fifth leaf stage, but time and labor constraints often limit farmers to one application. Some brands of MSMA (1 to 1.3 pt/A) also may be applied over-the-top of young cotton (3 to 6 inches) with the potential to reduce nutsedge competition. Growers, being familiar with other MSMA tank mixes, questioned the response of nutsedge to glyphosate plus MSMA applied over-the-top of cotton in the three-to-four leaf stage. This has been the most frequently asked question regarding cotton weed control in Georgia. Therefore, experiments were conducted to determine nutsedge and cotton response to glyphosate/MSMA tank mixtures.

Field studies consisted of planting Deltapine 458 BG/RR cotton in heavily infested yellow nutsedge (*Cyperus esculentus*) fields in Hawkinsville and Tifton, Georgia. Treatments were arranged factorially in a randomized complete block design with three or four replications. Treatment options included Roundup Ultra (glyphosate) at 0, 0.5, 1.0, 1.5, and 2 pt/A and Bueno 6 (MSMA) at 0, 0.65, 1.3, and 2.67 pt/A. Applications were made when cotton was in the 3- to 4-leaf stage. Yellow nutsedge was 5 to 8 inches with 5 to 7 blades at time of treatment. Weed control and crop injury were estimated visually 10, 30, and 40 days after treatment.

Roundup Ultra at 0.5, 1.0, 1.5, and 2 pt/A controlled yellow nutsedge 23, 48, 65, and 71%, respectively, 30 days after treatment. Mixing 0.65 pt/A of MSMA with 1, 1.5, and 2 pints of Roundup Ultra was of little benefit. It did increase yellow nutsedge control by 12% when Roundup Ultra was applied at 0.5 pt/A. Mixing 1.3 pints of MSMA with Roundup Ultra improved nutsedge control 15 to 16% only when Roundup Ultra was applied at 0.5 and 1 pt/A. Neither 0.65 nor 1.3 pt/A of MSMA increased yellow nutsedge control sufficiently when applied at normal Roundup Ultra use rates of 1.5 to 2.0 pt/A. For example, 1.3 pt/A of MSMA mixed with 2 pt/A of Roundup Ultra provided 80% control, only a 9% numerical increase in control compared to Roundup Ultra 2 pt/A alone. MSMA alone at 2.67 pt/A controlled yellow nutsedge 91% but this rate of MSMA must be directed and not applied topically.

Roundup Ultra alone did not injure cotton; however, injury by MSMA increased as the rate of Roundup Ultra increased. As the rate of Roundup Ultra increased, the amount of pre-formulated adjuvant increased accordingly, thus potentially causing greater injury by MSMA. For example, 1.5 to 2 pt/A of Roundup Ultra in mixture with MSMA injured cotton 8 to 15% more than MSMA applied alone at each rate.

Although growers would like to mix glyphosate and MSMA for yellow nutsedge control, this research suggests this is not the best choice. There will be an additional cost of adding MSMA to the tankmix, potential for greater cotton injury, and a follow-up postemergence herbicide treatment will still be needed. The best choice would be to make sequential glyphosate applications prior to 5-leaf cotton or to apply glyphosate over-the-top prior to 5-leaf cotton and follow with a directed application of MSMA (2.67 pt/A) or glyphosate.