

## NUTSEDGE MANAGEMENT WITH ROUNDUP READY™ (GLYPHOSATE-TOLERANT) COTTON

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### Abstract

Nine field experiments were conducted in 1998 and 1999 at the Tidewater AREC (TAREC), Suffolk, VA and at on-farm locations in southeastern Virginia to evaluate nutsedge management systems utilizing Roundup Ultra and MSMA with Roundup Ready™ cottons. At all locations experiments were conducted in a randomized complete block design with 3 replications. Soil texture ranged from sand to sandy loam, organic matter from 1.1 to 3.7% and pH from 5.6 to 6.6.

Herbicide treatments as topical or directed sprays were applied with a delivery volume of 15 gpa. Treatments consisted of a topical application of either 32 fl oz/A Roundup Ultra (glyphosate) or 16 oz/A MSMA (6 lb ai/gal) to 2 to 4-leaf cotton. Topical treatments of Roundup Ultra were followed with no additional treatment, with 1 or 2 directed sprays of either Roundup Ultra (32 fl oz/A) or MSMA (2.66 pt/A) when cotton was at least 6 inches in height. Topical treatments of MSMA were followed with no additional treatment or with 1 or 2 directed sprays of MSMA (2.66 pt/A) when cotton was at least 6 inches in height. In two trials (TAREC, 1998 and Chesapeake, Va, 1999) no soil applied herbicides were utilized on the experimental areas. In seven trials soil applied DNA herbicides (Prowl 3.3EC (pendimethalin) 1.5 pt/A or Treflan 4EC (trifluralin) 1.0 pt/A) and Cotoran 4L (fluometuron) (2.0 pt/A) were utilized on the experimental areas to reduce or eliminate annual grass and broadleaf weeds. Cotton lint yield was determined for the TAREC locations in 1998 and 1999. Yield was not determined at the on-farm locations.

Crop response and weed control were visually evaluated at mid-season (July 15 to August 15) at all locations utilizing a 0 to 100% scale. A visual rating of 0 represented no crop injury or weed control and a visual rating of 100 represented complete crop kill or complete weed control.

### Yellow Nutsedge (*Cyperus Esculentus*)

Across five locations a single over-the-top application of Roundup Ultra (32 oz/A) to 2 to 4-leaf cotton provided 53 to 83% control of yellow nutsedge with an average of 68% control. Where a follow-up treatment of Roundup Ultra (32 oz/A) was applied as a single directed spray (seven locations) yellow nutsedge control ranged from 87 to 100% with an

average of 93% control. When an over-the-top application of Roundup Ultra was followed with a directed spray of MSMA (2.66 pt/A), at four locations, yellow nutsedge control ranged from 90 to 100% control with an average of 96% control.

Across three locations a single over-the-top application of MSMA (16 oz/A) provided 32 to 57% control of yellow nutsedge with an average of 44% control. At four locations when an MSMA over-the-top treatment was followed with a directed spray of MSMA at 2.66 pt/A, yellow nutsedge control ranged from 60 to 100% with an average of 84% control.

### Purple Nutsedge (*Cyperus Rotundus*)

Purple nutsedge control was evaluated at two on-farm locations in 1999 (Isle of Wight and Southampton counties). A single over-the-top application of Roundup Ultra (32 oz/A) provided 45 and 70% control of purple nutsedge with an average of 58% control. Where a follow-up application of Roundup Ultra (32 oz/A) was applied as a directed spray, purple nutsedge control ranged from 85 to 93% control with an average of 89% control. Where a single over-the-top application of Roundup Ultra (32 oz/A) was followed with a directed spray of MSMA (2.66 pt/A) purple nutsedge control ranged from 72 to 80% control with an average of 76% control.

A single over-the-top application of MSMA at 16 oz/A provided 0 to 10% purple nutsedge control at the Isle of Wight and Southampton county locations. Where a follow-up application of MSMA (2.66 pt/A) was applied as a directed spray purple nutsedge control was 33% and 42% respectively.

### Cotton Yield

In 1998, with the absence of the use of soil applied herbicides at the TAREC location, plots receiving a single over-the-top application of either Roundup Ultra (32 oz/A) or MSMA (16 oz/A) could not be harvested due to a heavy late season infestation of annual grasses, morningglory species and common ragweed. Sequential O/T and directed sprays of MSMA (16 oz/A fb 2.66 pt/A) resulted in a yield of 817 lb lint/A. Sequential O/T and directed sprays of Roundup Ultra (32 oz/A fb 32 oz/A) resulted in a yield of 1136 lb lint/A.

In 1999 the experimental area was treated with Prowl 3.3EC 1.5 pt/A PPI followed by Cotoran 4L 2.0 pt/A preemergence. At this location single over-the-top applications of Roundup Ultra (32 oz/A) and MSMA (20 oz/A) followed by 1 and 2 directed sprays of either Roundup Ultra (32 oz/A) or MSMA (2.66 pt/A) resulted in yields of 833, 911, 870 and 873 lb lint/A respectively. MSMA (20 oz/A) over-the-top followed by 1 and 2 applications of MSMA (2.66 pt/A) resulted in a yield of 766 and 656 lb lint/A respectively.

These data indicated that single applications of either Roundup Ultra (32 oz/A) or MSMA (16 to 20 oz/A) applied over-the-top of cotton at the 2 to 4-leaf stage are unsatisfactory for control of either yellow or purple nutsedge. Sequential application of Roundup Ultra (32 oz/A) over-the-top followed by directed sprays of either Roundup Ultra (32 oz/A) or MSMA (2.66 pt/A) provided good to excellent control of yellow nutsedge. Sequential application of MSMA (16 to 20 oz/A) over-the-top of cotton followed by a directed spray of MSMA (2.66 pt/A) provided fair to good control of yellow nutsedge, but unsatisfactory control of purple nutsedge. Sequential applications of Roundup Ultra provided good control of purple nutsedge.

Yield of cotton treated with sequential applications of Roundup Ultra followed by either Roundup Ultra or MSMA were significantly higher than yield of cotton treated with sequential applications of MSMA.