PURPLE NUTSEDGE MANAGEMENT IN ROUNDUP READY COTTON

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Abstract

Field experiments were conducted at the West Florida Research and Education Center near Jay, FL in 1997 and 1998. Cotton (DP 5415 RR) was planted in an area naturally infested with purple nutsedge (*Cyperus rotundus*). The first experiment was designed to investigate the effect of glyphosate rate and time of application on purple nutsedge control. The entire test area was treated with pendimethalin (0.84 kg/ha PPI) and fluometuron (1.7 kg/ha PRE). Glyphosate was applied at 0.57, 0.85 and 1.12 kg/ha as a single postemergence treatment (POT) or a split application with a POT followed by (fb) a post-directed spray (PDS) at each rate four weeks after the POT treatment. Herbicide treatments were applied to purple nutsedge either at 15 cm or 30 cm tall.

In 1997 there was no difference in control between glyphosate rates early season when applied at 15 cm purple nutsedge. However, in 1998 when growing conditions were less optimal due to drought, glyphosate at 0.57 kg/ha resulted in 55% early season control when applied at 15 cm, whereas 0.85 kg/ha resulted in 75% control. By late season in 1997 80% purple nutsedge control was observed regardless of rate when applied at 15 cm, but when delayed until 30 cm 0.85 kg/ha was necessary for 80% control. In 1998 when growing conditions were less optimal, 70% late season control was observed when applied at 15 cm purple nutsedge with 0.57 kg/ha and was increased to 90% when 0.85 kg/ha was applied. When applications were delayed until 30 cm in 1998 90% control was observed. However, delaying application in 1998 until 30 cm purple nutsedge resulted in 25% early season and 15% late season cotton stunting, thus reducing yields by at least 10%. In 1997 there was no difference in yield regardless of glyphosate rate or purple nutsedge stage of development at application. The addition of a PDS four weeks after initial POT did not increase weed control or yield in either year.

In the second study glyphosate and MSMA herbicide programs were evaluated to determine the effect of long-term purple nutsedge control and tuber populations. Treatments were conducted on the same plots in 1997 and 1998 and the entire test area received pendimethalin (0.84 kg/ha PPI). Herbicide treatments included an untreated check; glyphosate early POT (1.12 kg/ha) fb glyphosate (1.12 kg/ha PDS); norflurazon (1.3 kg/ha) plus fluometuron (1.7 kg/ha) PRE fb MSMA (2.24 kg/ha) plus cyanazine (0.85 kg/ha) PDS; norflurazon plus fluometuron (each at 1.7 kg/ha PRE) fb MSMA (1.12 kg/ha EPOT) fb MSMA (2.24 kg/ha) plus cyanazine (0.85 kg/ha) PDS; norflurazon (1.3 kg/ha) plus fluometuron (1.7 kg/ha) PRE fb glyphosate (1.12 kg/ha EPOT) fb glyphosate (1.12 kg/ha PDS). Herbicide treatments were duplicated within the experiment, one of which received an early season cultivation.

Glyphosate treatments provided at least 85% mid-season control and 95% late season control regardless of cultivation. MSMA fb MSMA plus cyanazine resulted in 65% mid-season control, which was increased to 75% with the addition of early season cultivation. By late-season there was no difference between glyphosate and MSMA treatments that included cultivation. With regard to purple nutsedge tuber populations, all treatments resulted in less tubers in 1998 than 1997 except for the untreated check without cultivation which increased from 180 tubers 0.25 m^{-2} to 360 tubers. Glyphosate treatments without cultivation decreased from 50 tubers 0.25 m^{-2} in 1997 to 10 tubers 0.25 m^{-2} in 1998. Glyphosate treatments with cultivation decreased from 30 tubers 0.25 m^{-2} in 1997 to 5 tubers 0.25 m^{-2} in 1998. The sequential MSMA treatment without cultivation decreased from 60 tubers 0.25 m^{-2} in 1997 to 10 tubers in 1998. The sequential MSMA treatment with cultivation resulted in 50 tubers 0.25 m^{-2} to 10 tubers in 1998. The addition of cultivation only by 1998 decreased tubers from 360 0.25 m^{-2} in the untreated check to 40 tubers 0.25 m^{-2}.

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