ROUNDUP READY SYSTEMS FOR WEED CONTROL IN NORTH CAROLINA

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Abstract

Experiments were conducted at Clayton and Rocky Mount, NC in 1995 and at Lewiston, NC in 1997 to investigate weed control, crop response, and yield of Roundup Ready cotton (Gossypium hirsutum L.). Weed management systems consisted of the following herbicide combinations: Treflan applied preplant incorporated (PPI) at 0.5 lb ai/ac with Cotoran preemergence (PRE) at 1.25 lb ai/ac alone or followed by (fb) 1) Cotoran at 1.0 lb/ac plus MSMA at 2.0 lb/ac early post-direct (EPDS) alone or fb Bladex at 1.0 lb ai/ac plus MSMA at 2.0 lb/ac at LAYBY, 2) Roundup early postemergence (EPOST) at 0.75 lb ai/ac alone or fb Bladex plus MSMA at LAYBY, 3) Staple at 1.0 oz ai/ac EPOST alone or followed by Bladex plus MSMA at LAYBY. Other systems evaluated included Treflan PPI fb Staple EPOST alone or fb Bladex plus MSMA LAYBY, and Cotoran PRE fb Roundup EPOST alone or fb Bladex plus MSMA LAYBY. Additional systems evaluated were Roundup applied EPOST alone or fb Bladex plus MSMA LAYBY; Cotoran PRE fb Roundup alone or fb Bladex plus MSMA LAYBY; and Treflan PPI plus Cotoran PRE fb Roundup as needed. For Roundup as needed systems, Roundup was applied EPOST over-the-top and then applied post-directed under a spray hood twice if residual soil-applied or LAYBY herbicides were used in 1995; while three applications of Roundup were post-directed under the spray hood in 1997 when no residual herbicides were used. There was an untreated check for comparison. All POST and Roundup treatments included a nonionic surfactant at 0.25% and 0.5% respectively in 1995, while only POST treatments used a nonionic surfactant in 1997. An unknown variety provided by Monsanto was planted in both studies in 1995 while Paymaster 1330RR was planted in 1997.

Weed species evaluated included prickly sida (Sida spinosa), velvetleaf (Abutilon theophrasti), volunteer peanuts (Arachis hypogaea), common lambsquarters (Chenopodium album), smooth crabgrass (Digitaria ischaemum), Ipomoea species including tall morningglory (Ipomoea purpurea), ivyleaf morningglory (Ipomoea hederacea), pitted morningglory (Ipomoea lacunosa) and entireleaf morningglory (Ipomoea hederacea var. integriuscula; large crabgrass (Digitaria sanguinalis), goosegrass (Eleusine indica), and Pennsylvania smartweed (Polygonum pennsylvanicum).

At Clayton in 1995, Roundup applied alone EPOST gave excellent control of broadleaf weeds and grasses. Due to a lack of residual control from Roundup, weeds reinfested these plots. The application of Bladex plus MSMA LAYBY following Roundup EPOST provided excellent full season control of all species. Multiple applications of Roundup provided control comparable to that of the aforementioned treatments. Crop injury was less than 5% with all treatments.

At Rocky Mount in 1995, multiple applications of Roundup provided excellent control of broadleaf weeds and grasses. Again, due to the lack of residual control, plots that received only Roundup were reinfested by later germinating weeds. Roundup applied three times or Roundup fb a LAYBY of Bladex plus MSMA improved control to at least 90%. Roundup provided a broader spectrum of annual broadleaf weed control than Staple at both locations in 1995. Bladex plus MSMA was essential for good season long weed control in most Staple and Roundup systems.

Velvetleaf control in 1997 at Lewiston was greater than 90% with all Roundup containing systems and equivalent control was provided by the Staple and LAYBY system. The traditional EPDS and LAYBY system controlled only 70% of the velvetleaf population. Roundup systems that used Cotoran PRE and/or a LABYBY treatment of Bladex plus MSMA provided excellent control of volunteer peanut. As seen in 1995, Roundup EPOST alone failed to provide season long weed control due to the lack of residual control. Roundup alone as needed systems did not provide adequate season long control of goosegrass and this reduced cotton yields. Across all three locations, the best weed control and yields were obtained with Roundup systems that used residual herbicides at planting and/or at LAYBY. Equivalent yields and weed control were often obtained with Staple-based systems and with the standard PDS and LAYBY system.

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