

**PRECONDITIONING COTTON WITH
GLYPHOSATE FOR DEFOLIATION**
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Introduction

In cotton production, every decision is geared toward timing of harvest for maximum yield and quality. This includes planting time, growing more determinate varieties, in season management, and defoliation timing. Delays related to equipment breakdowns and early fall rains can disrupt the harvest schedule of the grower. Early rains can promote basal and terminal regrowth of the cotton which can adversely affect quality by staining lint and increasing trash content. The University of California Cooperative Extension has conducted a number of studies at the Westside Research Station to determine the efficacy of using Roundup (glyphosate) as a preconditioner to defoliation to achieve earlier harvest and inhibit regrowth.

Materials and Methods

1993 Study An Acala GC-510 cotton field was divided into 3 replications of 7 treatments in a randomized complete block design (RCBD). Roundup, at 2 rates was applied at 9 nodes above the cracked boll (NACB), 8 NACB and 6 NACB with a CO₂ backpack sprayer in 20 gpa volume at 30 psi with four 8002 nozzles. All treatments were defoliated with Prep and Folex at 0.75 lb ai/A each at 4 NACB, applied with a Hagie High Cycle in 20 gpa volume at 35 psi with 8003 flat fan nozzles at 4 mph.

1994 and 1995 Studies Acala Maxxa cotton fields were divided into 3 replications of 6 treatments in a RCBD. In 1994, Roundup was applied at two rates at 8 and 6 NACB and followed by Prep and Folex at 1.5 lb ai/A each at 4 NACB. In 1995, Roundup was applied at 8 NACB and Followed by either Prep and Folex at 1.5 lb ai/A each or Ginstar at 10 oz/A at 4 NACB. Application criteria is the same as for 1993 Hagie High Cycle.

In 1993, evaluations were made for defoliation and desiccation at 14 & 21 days after defoliation treatment (DAT); regrowth - 28 DAT and plots were harvested for lint yield.

In 1994, evaluations were made for defoliation and desiccation at 7, 14, and 21 DAT; % regrowth at 21 DAT.

In 1995, evaluations were made for defoliation and desiccation ratings at 7 and 14 DAT; % regrowth at 28 DAT. Plots were harvested for lint yield and seed quality in 1994 & 1995.

Results and Discussion

Defoliation

1993 There were no statistically significant differences at 14 or 21 DAT, with defoliation ranging from 27% to 48% at 21 DAT.

1994 At 7 DAT, the untreated control (UTC) was significantly lower than any of the treatments which were not significantly different from each other. At 14 DAT, the Roundup treatments ranging from 70% to 72% were only significantly different from Prep and Folex with no pretreatment at 60% or the UTC. At 21 DAT, there were no significant differences between treatments which were all significantly greater than the UTC with a range of 12% to 90%.

1995 At 7 DAT, Roundup at 2 lb ai applied at 8 NACB, Followed by Ginstar at 68%, was significantly greater than any other treatment. There were no differences between Roundup at 2 lb ai Followed by Prep and Folex (53%) or Roundup at 1 lb ai Followed by Ginstar (55%). All Roundup applications were significantly greater than Prep and Folex or the UTC. At 14 DAT, there were no significant differences between treatments (66% to 79%) and all were greater than the UTC (5%).

Desiccation

1993 There were no statistically significant differences.

1994 At 7 DAT, Roundup at 1 lb ai at 6 NACB (22%) was only significantly greater than Roundup at 1 lb ai at 8 NACB (10%), Prep and Folex (10%), and the UTC (0%). At 14 DAT, there were no significant differences between treatments ranging from 13% to 18% but all were greater than the UTC at 3%. At 21 DAT, there were no significant differences with a range of 3% to 10%.

1995 At 7 DAT, Roundup at 1 lb ai Followed by Prep and Folex (14%) and Prep and Folex (16%) were significantly less than any other treatment (38% to 53%). At 14 DAT, there were no significant differences.

Percent Regrowth

1993 At 28 DAT, Roundup at 2 lb ai at 8 and 9 NACB exhibited the most control at 27% and 18%. Prep and Folex showed the least control at 88%.

1994 At 21 DAT there were no significant differences for top regrowth. Prep and Folex and the UTC provided the least control of basal regrowth at 64% and 85%. There were no significant differences between any of the Roundup treatments with a range of 3% to 24%.

1995 At 28 DAT, there were no significant differences for terminal regrowth except between Roundup at 1 lb ai Followed by Ginstar and Roundup at 2 lb ai Followed by either defoliation materials were significantly less than the UTC. Roundup at 2 lb ai followed by Ginstar (5%) exhibited significantly greater basal regrowth control than any other treatment or the UTC.

Lint Yield

There were no significant differences in lint yield regardless of the year, the treatment or the timing of application.

Seed Quality

1994 The UTC had the least warm germination at 79% which was significantly different from all the treatments. Roundup at 1 lb ai applied at 6 NACB and 2 lb applied at 8

NACB exhibited the greatest warm germination at 88% each. There were no significant differences in germination for the cold test with a range of 70 to 79.

1995 There were no significant differences for either warm or cold germination. Warm germination percents ranged from 89% to 94% and cold germination percents ranged from 84% to 89%.

Conclusions

Roundup had a significant effect on regrowth in all years tested especially on basal regrowth. Roundup can be a very effective tool during a wet, rainy season when harvesting may be delayed longer than 14 to 21 days after defoliation.