

# **ROUNDUP READY PROGRAMS AND TILLAGE COMBINATIONS**

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## **Abstract**

Weed control continues to limit the adoption of no-tillage production methods. New weed control technology such as Roundup Ready cotton may make no-tillage more feasible.

Four treatment programs were evaluated in conventional and no-tillage systems: 1) A full program of conventional, non-transgenic herbicides, 2) Roundup (glyphosate) only, 3) Roundup followed with a traditional, residual, layby treatment and 4) Conventional preemergence herbicides followed with Roundup. The specific herbicides, rates and timings are listed in Table 1. No tillage plots received a 1 qt/A Roundup application approximately 2 weeks before planting. Individual trials were designed as a split plot with tillage main plots and herbicide-program sub plots. Experiments were conducted at Jackson TN, Milan TN and Portageville MO in 1996 and 1997. Standard weed science research methods were used. Growing conditions in 1996 and 1997 were somewhat adverse.

There was a year by location by tillage by treatment interaction; however, average cotton lint yields for the tillage and herbicide programs are shown in Table 2. With the exception of PRE/Roundup programs, lint yields were higher in conventional-tillage plots. Roundup alone provided similar yield to that from full programs of conventional herbicides. In no-tillage, the PRE/Roundup program provided higher cotton yield than did the Roundup-Alone program. Preemergence herbicides did not benefit yield in Roundup programs in conventional tillage. In no-tillage, Roundup/layby programs yielded less than PRE/Roundup and Roundup-Alone programs; however, this could be largely attributed to two individual studies where the Roundup/layby-no-till program had exceptionally low yield. When those two treatment-location combinations were deleted from the data, Roundup/layby programs then yielded similarly in both tillage regimes.

Economic returns were influenced most strongly by cotton yield. However when particular herbicide and tillage programs yielded similarly, cost differences often favored

a slightly lower yield over a more expensive weed control program.

All weed control programs provided good weed control and crop yields at particular locations. Weather and application timing likely caused location and year interactions. Preemergence herbicides benefitted Roundup in no-tillage but not in conventional tillage. There was no benefit from residuals at layby. Roundup did not provide any specific benefit to make no-tillage more feasible; However, additional and economical weed control choices are, nevertheless, helpful.

Table 1. Weed control program nicknames, specific herbicides, rates and timings for tillage studies.

Trade name	Common Name	Broadcast rate, lb AI/A	Timing*
<b>"Conventional"</b>			
Prowl	pendimethalin	1	PPI or PRE**
Cotoran	fluometuron	1.2	PRE
Staple***	pyrithiobac	0.0625	Early POST
Bladex	cyanazine	0.4 or 0.8**	Directed@6-9"
MSMA***	MSMA	2	Directed@6-9"
<b>"Roundup alone"</b>			
Roundup Ult.	glyphosate	0.375	Early POST
Roundup Ult.	glyphosate	0.375	Directed@6-9"
<b>"Roundup/layby"</b>			
Roundup Ult.	glyphosate	0.375	Early POST
Roundup Ult.	glyphosate	0.375	Directed@6-9"
Bladex	cyanazine	0.4 or 0.8**	Directed/layby
MSMA***	MSMA	2	Directed/layby
<b>"PRE/Roundup"</b>			
Prowl	pendimethalin	1	PPI or PRE
Cotoran	fluometuron	1.2	PRE
Roundup Ult.	glyphosate	0.375	Early POST
Roundup Ult.	glyphosate	0.375	Directed@6-9"

\*Abbreviations: PPI = preplant incorporated, PRE = preemergence, POST = postemergence, over-the-top.

\*\*In conventional tillage, Prowl was incorporated at Portageville and applied preemergence at Jackson and Milan. Bladex was applied at 0.4 lb ai/A at Portageville and 0.8 lb ai/A at Jackson and Milan.

\*\*\*Staple was applied with 1/4% v/v nonionic surfactant, A surfactant-containing MSMA formulation was used in the Bladex + MSMA tank mixture.

Table 2. Average lint yields for tillage and herbicide programs for Roundup Ready cotton tests conducted at Jackson TN, Milan TN, Portageville, MO in 1996 and 1998

Weed Control Program	Tillage Method	
	None	Conventional
	----- (lb lint/A) -----	
Conventional	844	994
Roundup alone	810	998
Roundup/layby	704	998
Pre/Roundup	933	969
Tillage mean herbicide programs	823	990
LSD 5% Within tillage	93	
LSD 5% Across tillage	169	