

## SUMMARY OF FINISH® EUP ON COTTON IN MS. & LA.

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### Abstract

FINISH® (EXP 31039) is a new cotton, harvest aid product used as a defoliant and boll opener that is currently under development by Rhone -Poulenc Ag. Co. FINISH® consists of two molecules: RPA90946[1-(2,4-dichlorophenylaminocarbonyl)-cyclopropane carboxylic acid] or commonly called Cyclanilide and Ethephon [(2-chloroethyl phosphonic) acid].

In 1996, Rhone -Poulenc was granted an Experimental Use Permit to test FINISH® on limited acres across the cotton belt. The objectives were to access the harvest aid efficacy of FINISH® under varying environmental & agronomic parameters, to compare FINISH® to currently labeled cotton defoliants and boll openers and to establish a standardized data collection and entry system. Thirty three EUP locations were established and evaluated in MS. and LA.

Results from MS. and LA. indicated that FINISH® provided superior and quicker boll opening capacities than the standards more than 80% of the time while being primarily equal to the standards the remainder of the time. The capabilities of FINISH® as a defoliant proved to be primarily better than or equal to the standard across the evaluation sites. Terminal regrowth control with FINISH® was as good or better than the standard. However, basal regrowth control was less than or equal to the standard treatments. It should be noted that where regrowth occurred (terminal or basal) in FINISH® treatments so did it occur in the comparison treatments. When harvestability was observed, FINISH® gave the earliest tendencies toward being harvest ready and allowed more cotton to be harvested during the first harvest over the standard treatments.

### Introduction

FINISH® as a harvest aid on cotton has been tested for several years both in the United States and in cotton producing countries abroad. Results from the data have shown similar trends in quicker boll opening, being equal to or better than the comparisons in defoliation, good juvenile regrowth control and more efficient harvest. The 1995 EUP data from the Mid-South showed FINISH® being the first

product to address the three major criteria for machine harvest (defoliation, boll opening and inhibition of regrowth) (1). Data acquired in the 1995 EUP further indicated FINISH® increased seed cotton yields by 100-200 lbs./Ac and provided faster boll opening (1). A two year study in Louisiana indicated that EXP 31039 at 1.0 and 1.5 lbs. ai/Ac. when compared to comparable rates of PREP™ increased defoliation, boll opening and control of juvenile regrowth (2). In another two year study in Louisiana comparing EXP 31039 B ( 1.0 - 1.5 lbs. ai /Ac) to equivalent rates of PREP™ or the standard of Dropp® + PREP™, revealed that defoliation was better with EXP 31039 which was equal to the standard. Boll opening by EXP 31039 in this study was superior to any of the comparative treatments (3). In a study spanning four years and more than 100 trials conducted abroad, showed that FINISH® at equivalent rates ensured as good or better boll opening than PREP™. When compared to PREP™ alone or tank mixed with another harvest aid product, defoliation with FINISH® was as good or better . They also reported FINISH® giving good inhibition of juvenile regrowth and boll opening was only slightly decreased at lower temperatures (5).

### Materials and Methods

Twenty MS. and nine LA. locations were selected and approved under the FINISH® EUP guidelines. Prior to application, five evaluation sites were established within each treatment area. These pre-marked plots were located at the four corners and center of each treatment. Ten plants for hill-dropped cotton and five plants for drilled cotton per evaluation site were permanently marked. The number of open and unopened bolls per plant was recorded on a standardized form which was used through the entire evaluation period.

Evaluation dates included 0 DAT, 3-7 DAT, 8-11 DAT, 12-16 DAT and 17-24 DAT. Measurements used in data collection included; % open bolls, % defoliation, terminal & basal regrowth, harvestability rankings & days to harvest. These measurements were made on a per plant basis within each of the five evaluation sites.

Regrowth was determined using a laminated scale (Developed by Mr. Gary Henniger of Rhone- Poulenc) in the field to assist in properly categorizing leaves resulting from regrowth based upon their size. The scale ranged from 0 equaling no regrowth, 1 equaling leaves having a diameter up to 1", 2 equaling leaf diameters of 1-1.5" and 3 equaling leaf diameters greater than 1.5".

Data was entered into an excel spreadsheet (Mr. John Hand and Christi Rejdovjan of Rhone-Poulenc) designed especially for summarizing the data for each location. FINISH® rates ranged from 1.0 lbs. ai/Ac to 2.0 lbs. ai/Ac across the testing area. The most commonly used FINISH® rate was 1.5 lbs. ai/Ac. Rates were based on the

cotton and weather conditions at time of application. Comparable rates were used for the standard harvest aid materials in most cases.

In MS. a harvest efficiency study was conducted comparing FINISH® at 1.5 lbs. ai/Ac to FOLEX® + Dropp® (.6 + .125 lbs. ai/Ac) and Dropp® + PREP™ (.125 + 1.0 lbs. ai/Ac). In this study open cotton from four, ten row-foot/treatment was hand-harvested. Five days later the cotton was harvested a second time to generate numbers for a first and second harvest. The cotton was weighed on an OHAUS digital scale. Dollar values at \$.70/lb of lint cotton were also extracted from these weights to obtain a dollar value/Ac.

### Discussion

**% Open Boll.** FINISH® was faster in boll opening than the standard at 3-7 DAT and 8-11 DAT. In MS. FINISH® showed a faster rate of boll opening at 83.3% and 63.6 % of the time compared to the standard treatments at 3-7 DAT and 8-11 DAT respectively. In LA. FINISH® also showed quicker boll opening at 59% and 44 % of the time when compared to the standards respectively. When evaluating 12-16 DAT in MS. , it can be observed that FINISH® completed boll opening several days earlier than the standards (Table 1).

**% Defoliation.** In MS. FINISH® treatments were equal to or greater than the comparative treatments in defoliation and was never less when the total averages were compared. FINISH® showed slightly greater defoliation than the standard at 8-11 and 12-16 DAT. In LA. FINISH® showed a higher rate of defoliation across all rating dates when compared to the standard treatments (Table 1).

**Terminal and Basal Regrowth.** FINISH® was equal to or showed less terminal regrowth than the standards across all rating dates in MS. and LA. FINISH® was equal to or slightly greater than the standards in basal regrowth in MS. at 3-7 and 8-11 DAT. At 12-16 DAT, basal regrowth was equal to the standard treatments. In LA. FINISH® was equal to or slightly greater in amounts of basal regrowth. As noted before, where regrowth occurred in the FINISH® treatments it occurred also in the standards (Table 2).

**Harvestability Ranking.** FINISH® treatments showed a greater incidence for earlier harvest in MS. and LA. than the comparative treatments. In MS. FINISH® was more ready to harvest 76.13%, 54.75% and 64.3% times at 3-7 DAT, 8-11 Dat and 12-16 DAT respectively. LA. data showed FINISH® more harvest ready 91.5 % and 90.0% of the times at 3-7 DATE and 8-11 DATE respectively when compared to the standard treatments (Table 3).

**Harvest Efficiency.** FINISH® also increased picker efficiency in MS. allowing more cotton to be harvested during the first harvest when compared to Droop® +

PREP™ and FOLEX® + Dropp®. FINISH® harvested 4.5% more cotton than Dropp® + PREP™ harvested on the same day and returned \$161.00/Ac over this treatment calculated at \$.70/lb. of lint cotton. The FOLEX® treatment had to be harvested five days later due to the reduction in open bolls. When it was harvested and compared to FINISH®, it harvested 2.2% less cotton and returned \$11.90/Ac less cotton than the FINISH®. FINISH® also returned the lowest dollar value following the second harvest \$94.23/Ac compared to \$173.33 for FOLEX® + Dropp® and \$277.67 for Dropp® + PREP™ (Table 4).

### Summary

FINISH® provided excellent boll opening, harvest and financial advantages over the standard treatments in both MS. and LA. It proved to be as good or better than the comparative treatments in defoliation and terminal regrowth control.

### Acknowledgments

FINISH® is a registered trademark of Rhone-Poulenc Ag Company.  
PREP™ is a trademark of Rhone -Poulenc Ag Company.  
FOLEX® is a registered trademark of Rhone-Poulenc Ag Company.  
Dropp® is a registered trademark of Nor-Am Chemical Company.

### References

- Fritz, C. D. 1996. Finish™ cotton harvest-aid. Proceedings Beltwide Cotton Conference. 56-57.
- Millhollon, E. P. 1995. Two year evaluation of EXP 31039 for cotton defoliation, regrowth inhibition and yield. Proceedings Beltwide Cotton Conference. 1155-1156.
- Reynolds, D. B., P. R. Vidrine and R. Shaw. 1995. Evaluation of EXP 31039B as a cotton defoliant. Proceedings Beltwide Cotton Conference. 1091-1092.
- Szoke, T. G. and R. J. Manlove. 1996. International experience with Finish™ (Cyclanilide + Ethephon). Proceedings Beltwide Cotton Conference. 1159-1161.

Table 1. FINISH® comparison to standards in open bolls and defoliation averaged across all treatments in MS. & LA. Reported in %.

OPEN BOLLS				DEFOLIATION		
MS.	3-7 DAT	8-11 DAT	12-16 DAT	3-7 DAT	8-11 DAT	12-16 DAT
>	83	64	43	24	25	25
=	43	23	43	52	54	56
<	13	14	14	24	21	19
LA						
>	59	44	43	59	69	59
=	35	56	57	12	13	17
<	6	0	0	29	19	25

> Represents a higher level of defoliation or boll opening from FINISH®  
 = Represents that FINISH® was equal to the standard  
 < Represents that FINISH® was less than the standard

Table 2. FINISH® comparison to the standards in relation to terminal regrowth for MS. & LA. averaged across all treatments. Reported in %.

TERMINAL REGROWTH			
MS.	3-7 DAT	8-11 DAT	12-16 DAT
>	3	4	4
=	92	87	93
<	5	10	4
LA			
>	9	25	50
=	84	60	17
<	9	15	33

> represents the % of times FINISH® showed more regrowth  
 = represents the % of times FINISH® was equal in regrowth  
 < represents the % of times FINISH® showed lower regrowth

Table 3. FINISH® comparison to the standards in harvestability ranking averaged across all treatments. Reported in %.

MS.	3-7 DAT	8-11 DAT	12-16 DAT
>	76	55	64
=	21	38	29
<	3	8	7
LA			
>	92	90	17
=	0	0	59
<	9	10	25

> represents the % of times FINISH® was better  
 = represents the % of times FINISH® was equal to  
 < represents the % of times FINISH® was less

Table 4. Harvest efficiency of FINISH® compared to standard defoliant in MS.. Data was extracted from hand harvest form a total of 40 row feet/treatment. Bottom date represents the 2ND harvest.

Treatment	Rate Lbs. ai/Ac	Date of Harv.	% First Harv.	\$ Value/Ac @ .70/Lb 1ST Pick	\$ Value/ Ac @ .70/Lb 2ND Pick
FINISH®	1.5	9-26/10-1	97	1,158	94
Dropp® + PREP™	.125+1.0	9-26/10-1	93	1,098	278
FOLEX® + Dropp®	.6+.125	10-1/10-5	95	1,146	173