

# COTTON HARVEST AID

## Research Progress Report

San Joaquin Valley

2006



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## 2006 Cotton Harvest Aid Research Summary

This report summarizes the applied defoliation research studies conducted during 2006. All projects were conducted at the West Side Research and Extension Center.

Although it is one of the last management decisions in the cotton production cycle, defoliation timing and application are critical to producing a profitable crop. Improper timing will compromise both seed cotton yield and quality. In light of the premium and discounts for fiber quality brought about by High Volume Instrumentation (HVI), proper choice and timing of harvest aid chemicals are of paramount importance. Ideally, the proper harvest aid materials should defoliate the entire plant within 14 days after application with minimal desiccation. However, plant maturity, moisture status, nitrogen status, and environmental conditions dictate this response.

The objective of these studies is to define the most appropriate conditions for ideal defoliation and crop termination. In addition, it is necessary to evaluate alternative, as well as new materials, to current defoliation programs in a manner to insure optimum performance and minimum impact on fiber quality.

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### HARVEST AIDS TESTED IN THESE STUDIES

<b>Brand Name</b>	<b>Common Chemical Name/Formulation</b>	<b>Company</b>
Agridex	Crop Oil Concentrate	Helena
Shark	Carfentrazone-ethyl	FMC
CottonQuik	2.25 lb/G Ethephon	Dupont
Def 6	6 lb/G Tribufos	Bayer
Defol 7	7 lb/G Sodium Chlorate	Monterey
ET Herbicide/Defoliant	0.2 EC Pyraflufen-ethyl	Nichino
Finish 6	6.75 lb/G Ethephon & Cyclanilide	Bayer
Ginstar	1.5 EC Thidiazuron & Diuron	Bayer
Gramoxone Inteon	Paraquat	Syngenta
Indicate 5	Buffer Adjuvant	J.R. Simplot
Induce	Nonionic Surfactants	Helena
Integrate	Surfactant (catalyst)	Catalyst
Prep	6 lb/G Ethephon	Bayer
Resource	0.86 EC Flumiclorac pentyl ester	Valent

## Cotton Harvest Aid Management 2006

Defoliation is necessary to prevent leaf stain and trash from contaminating cotton lint. A well timed and effective defoliation can be pay in many ways. This earliness will be advantageous not only for defoliation but advancing the start of harvest and reducing the potential of late season whitefly and aphid infestation. Other advantages of an earlier harvest are: Defoliant are much more effective when temperatures are warm  $>80$  F.

Harvest in October with longer, warmer days is much more effective and time efficient than during shorter, cooler, and possibly wet days of November. Fiber quality is preserved. An earlier finish results in the completion of more groundwork before winter rain. The threat of the rain and emphasize the importance of beginning as soon as possible.

The effectiveness of defoliation varies from season to season and often from field to field depending on nitrogen status of the crop, boll load, irrigation termination, temperatures, and soil types. Some rough guidelines were developed to manage 2 basic scenarios 1. A crop with a high boll load and early termination (like 2004). When irrigation termination and nitrogen depletion are synchronized with boll maturity high yielding fields become easy to defoliate.

### **Factors to consider when selecting a defoliation strategy.**

**Condition 1.** Fields with heavy boll load, abrupt cutout, and warm temp  $>80$  F. at application. Fields at 4 nodes of above cracked boll or  $> 55$  to  $60$  % open boll.

- Lower rates (4-6) oz of Ginstar should be effective. Def/Folex plus a boll opener should also be effective. Tank mixing ethephon treatments for boll opening (Prep, Finish, and CottonQuick) will be useful for faster and more complete leaf drop. This is especially important in areas with whiteflies or aphids. Def or Folex also help to drive out whiteflies.
- On Upland varieties standard rates of chlorate plus paraquat, ET, or Shark or as split applications should be effective but less so than Ginstar combinations or Def/Folex plus ethephon.

**Condition 2.** Late plantings, low retention, rank growth in Acala or Pima, vigorous, late-maturing fields with smaller boll loads (like 2006, 2005, 2003, 1998, 1995), or cool temperature  $<80$  F. at application. Fields at 4 nodes of above cracked boll (3-4 NACB) on Pima, or  $> 55$  to  $60$  % open boll.

With these more vigorous plants with a high proportion of later-maturing bolls, it may be desirable to consider some different practices to improve chances for acceptable defoliation, desiccation, control regrowth, and to improve chances of getting later-maturing bolls to open. Continued higher than normal temperatures will help in maturing these bolls, but as usual, there is no "magic bullet" that will make all those late bolls mature and open. Growers will need to look at the calendar, judge the likelihood that good weather will continue, and decide which bolls they really can afford to wait for.

- Ginstar rates should increase (7 to 10 oz. on Acala and 10-13 oz. on Pima) tank mixed with a boll opener. The addition of Shark or ET at low label rates may help in some cases.
- Sequential applications required. The first application aims to open canopy. A second application of chlorate plus paraquat, ET, or Shark is needed to defoliate or desiccate remaining leaves.
- Another approach is a 2 step approach starting with a low rate 3-6 oz of Ginstar plus 1 pt. of ethephon followed by Ginstar at a higher rate (6 to 13 oz.) plus 1-2 pts. of ethephon.

*Beginning at 6 NACB Strategy One:* In some fields it is necessary to start defoliation early due to late season insects or it is getting late. Several UCCE field studies conducted during the 1990's demonstrated a benefit in defoliation and boll opening by applying a pre-treatment of 4-6 oz of Ginstar at 6 nodes above cracked boll (NACB) followed by later treatments (at 4 NACB) of: (1) Ginstar at 8 oz. in combination with a boll opener material (such as Prep, Cotton Quick, Finish or others); or (3) Def/Folex plus a boll opener. Ginstar rates should be adjusted if major changes in air temperatures occur at application or are anticipated in the days following application. In many cases in both Acala and Pima, a final application of sodium chlorate and Gramoxone or Shark or ET will also be useful in desiccating remaining leaves and improving opening of last-remaining bolls. UC studies showed that applying ethephon at 6 NACB reduced yields and quality compared to 4 NACB. This season because of the missing bolls in the middle the NACB technique may not be useful. 6 NACB = 30 to 40 % open boll and 4 NACB = 55 to 65 % open boll.

*Strategy Two beginning at 8 NACB:* An approach for vigorous, late-maturing cotton fields, particularly when there are concerns that fields are not making progress in opening up bolls, involves use of glyphosate as a pre-treatment in non RR varieties. UCCE studies done on Acala varieties during the 1990's looked at several timings for these pre-treatment glyphosate applications. The treatment combinations in these studies consisted of glyphosate pre-treatments at 1 qt/acre rates tested at timings of 8, 9 or 10 nodes above cracked boll, followed 7-10 days later by standard defoliation treatments involving Def/Folex or Ginstar with or without boll openers. Results showed some advantages in earlier opening of later-developing bolls with the glyphosate pre-treatments. However, care should be exercised to make sure of the average NACB status of the field and relative percentages of the total field at various stages of maturity. Glyphosate should not be applied before about 8 NACB for these pre-treatments in Acala varieties, since the research showed yield losses of 5 to 12% with earlier applications at 10 NACB. Field studies that followed the 8 NACB with a Ginstar application at 6 NACB as mentioned above and then a 3<sup>rd</sup> application with the full rate of Ginstar plus ethephon was very effective on late, rank fields in 2005. Some PCA's experienced better results though in 2005 by skipping the glyphosate and starting on the 6 node application of Ginstar instead.

*Strategy Three:* Another approach is to closely pay attention to the calendar, the weather, and consider how much risk you want to take in choosing a final harvest date. Consider these steps:

1. Keep an eye on predicted trends in the weather.
2. Consider your own experience with how many days of harvest will likely be needed from harvest of your first field to the last field.
3. Decide what you think is the last harvest date you consider to be an acceptable risk.
4. Count back about 21 days from those desired harvest dates, and start with your defoliation program on those dates no matter what maturity stage (what NACB) the crop is in.

University Acala and Upland cotton defoliation trials in the 1980's and 1990's demonstrated that, on the average, defoliations initiated at 8 NACB resulted in yield losses of about 5% when compared with initiation at 4 NACB, while those initiated at 6 NACB reduced yields 2 to 3%. However, those same studies acknowledged that when a very large percentage of the total crop consists of bolls on the upper 6 to 9 fruiting branches, losses from early defoliant applications can be substantially more (over 10%). Particularly under circumstances of mostly a mid-canopy and top-crop, the closer you can get to 4 to 6 NACB prior to first defoliant application, the lower the yield loss.

## 2006 Defoliation Study in Pima Cotton 1

UCCE--Tulare/Kings Co--WSREC, Field 45

Steve Wright, Bob Hutmacher, Lalo Banuelos, Matthew Mills, Mark Keeley, Sark Davidian,  
Anna Brown, Sarah Hutmacher, Ben Ainley, Tony Garcia, Ed Scott, Merf Solorio

This field was planted with Roundup Ready Flex PhytoGen 800R on April 27, 2006 with seed rate of 14 lbs/A. The field was irrigated 3 times using pressure bomb readings of 18-20 bars to better manage plant vigor. In addition, the field received 1 pint of Pix Ultra at first flower and 1 pint of Pix Ultra 2 weeks after first flower.

The first treatment was applied on October 12, when the cotton was at 8 nodes above cracked boll (NACB) and 40-45 percent open boll, with each treatment set to various rates and volumes (Table 1). A second treatment was applied October 19, 2006. All treatments were applied with a Hagie High Cycle sprayer using 8002 nozzles with a 40 psi setting. The volume used was 15gal/A with the speed of 4 mph. Defoliation, desiccation, and open boll percentages were visually recorded at 7, 14, and 21 days after treatment (DAT). Five plants per plot were evaluated for terminal and basal regrowth at 21 DAT using a 0-5 scale (verifies number of plants showing regrowth).

At 7 DAT, all treatments rated average to above average for defoliation. The lowest rating was treatment 5 (6 oz Ginstar + 12 oz Finish + 1 pt Agridex) with 50 percent and the highest was treatment 2 (Ginstar 5 oz + Finish 12 oz + Agridex 1pt) with 65 percent. All other treatments rated from 55 percent to 58 percent. Treatment 4 (Ginstar 5 oz + Finish 12 oz + Agridex 1 pt) rated the lowest for desiccation with 33 percent and treatment 2 rated the highest with 67 percent. All other treatments rated from 35 percent to 48 percent desiccation (Table 1). Open boll percentages ranged within 60-70 percent for all treatments with treatments 8 and 9 being the lowest at 63 percent and 62 percent respectively and treatment 2 being the highest at 70 percent (Table 2). The 2<sup>nd</sup> application, treatment B, was applied at 7 DAT.

At 14 DAT, all treatments rated above average for defoliation in the 80 percent range. Treatment 8(Ginstar 10 oz + CottonQuik 3 pt + Agridex 1 pt followed by Defol 750 1.6 qt + Gramoxone Inteon 16 oz + Induce 4.8 oz) had the highest rating at 88 percent. The desiccation rated above average for all treatments with treatments 4(Ginstar 5 oz + Finish 12 oz + Agridex 1 pt followed by Ginstar 10 oz + CottonQuik 3 pt + Agridex 1 pt) and 8 having the highest at 92 percent. All others rated from 83 to 88 percent desiccation (Table 1). Open boll also displayed above average percentages and ranged from 82 to 92 percent with treatment 1(Ginstar 5 oz + Finish 12 oz + Agridex 1 pt followed by Ginstar 10 oz + Finish 20 oz + Agridex 1 pt) having the lowest percentage, 82 percent, and treatment 2 (Ginstar 5 oz + Finish 12 oz + Agridex 1 pt followed by Ginstar 10 oz + Finish 24 oz + Agridex 1 pt) having the highest with 92 percent (Table 2).

At 21 DAT, there was relatively little to no change in the defoliation and desiccation ratings for all treatments but, treatment 7(Ginstar 6 oz + Finish 12 oz + Agridex 1 pt followed by Ginstar 10 oz + Finish 28 oz + Agridex 1 pt) with 90 percent for both defoliation and desiccation, and treatment 1 (Ginstar 5 oz + Finish 12 oz + Agridex 1 pt followed by Ginstar 10 oz + Finish 20 oz + Agridex 1 pt) with a slight increase in defoliation. All other treatments had the same above average defoliation and desiccation ratings as the last rating period (Table 1). There was, however; an increase in the open boll percentages, with approximately 2 percent more for all treatments (Table 2). All treatments had a zero rating for both terminal and basal regrowth (Table 2).

## 2006 Defoliation Study in Pima Cotton 1

**Table 1.**

Treatment	Rate pr/A	Timing	Percent Defoliation			Percent Desiccation		
			7 DAT	14 DAT	21 DAT	7 DAT	14 DAT	21 DAT
1. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	5 oz + 12 oz + 1 pt 10 oz + 20 oz + 1 pt	8NACB	58	80	82	35	87	87
2. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	5 oz + 12 oz + 1 pt 10 oz + 24 oz + 1 pt	8NACB	65	85	85	67	83	83
3. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	5 oz + 12 oz + 1 pt 10 oz + 28 oz + 1 pt	8NACB	58	87	87	35	85	85
4. Ginstar + Finish + Agridex B. Ginstar + CottonQuik + Agridex	5 oz + 12 oz + 1 pt 10 oz + 3 pts + 1 pt	8NACB	55	83	83	33	92	92
5. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	6 oz + 12 oz + 1 pt 10 oz + 20 oz + 1 pt	8NACB	50	87	87	38	88	88
6. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	6 oz + 12 oz + 1 pt 10 oz + 24 oz + 1 pt	8NACB	55	82	82	47	80	80
7. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	6 oz + 12 oz + 1 pt 10 oz + 28 oz + 1 pt	8NACB	58	85	90	47	87	90
8. Ginstar + CottonQuik + Agridex B. Defol 750 + Gramoxone Inteon + Induce	10 oz + 3 pts + 1 pt 1.6 qt + 16 oz + 4.8oz	8NACB	58	88	88	48	92	92
9. Ginstar + Finish + Agridex B. Defol 750 + Gramoxone Inteon + Induce	10 oz + 24 oz + 1 pt 1.6 qt + 16 oz + 4.8oz	8NACB	57	87	87	40	88	88

**Table 2.**

Treatment	Rate pr/A	Timing	Percent Open Boll			Regrowth at 21 DAT	
			7 DAT	14 DAT	21 DAT	Terminal	Basal
1. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	5 oz + 12 oz + 1 pt 10 oz + 20 oz + 1 pt	8NACB	65	82	87	0	0
2. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	5 oz + 12 oz + 1 pt 10 oz + 24 oz + 1 pt	8NACB	70	92	93	0	0
3. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	5 oz + 12 oz + 1 pt 10 oz + 28 oz + 1 pt	8NACB	68	85	87	0	0
4. Ginstar + Finish + Agridex B. Ginstar + CottonQuik + Agridex	5 oz + 12 oz + 1 pt 10 oz + 3 pts + 1 pt	8NACB	65	83	85	0	0
5. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	6 oz + 12 oz + 1 pt 10 oz + 20 oz + 1 pt	8NACB	67	85	87	0	0
6. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	6 oz + 12 oz + 1 pt 10 oz + 24 oz + 1 pt	8NACB	65	83	85	0	0
7. Ginstar + Finish + Agridex B. Ginstar + Finish + Agridex	6 oz + 12 oz + 1 pt 10 oz + 28 oz + 1 pt	8NACB	67	87	90	0	0
8. Ginstar + CottonQuik + Agridex B. Defol 750 + Gramoxone Inteon + Induce	10 oz + 3 pts + 1 pt 1.6 qt + 16 oz + 4.8oz	8NACB	63	83	87	0	0
9. Ginstar + Finish + Agridex B. Defol 750 + Gramoxone Inteon + Induce	10 oz + 24 oz + 1 pt 1.6 qt + 16 oz + 4.8oz	8NACB	62	83	85	0	0

Five plants per plot were evaluated for terminal and basal new growth using a 0-5 rating scale. The 0 to 5 numbers represent the number of plants in sample showing regrowth i.e. 3 = 3 of the 5 plants are showing regrowth.

## 2006 Defoliation Study in Pima Cotton 2

UCCE--Tulare/Kings Co--WSREC, Field 45

Steve Wright, Bob Hutmacher, Lalo Banuelos, Matthew Mills, Mark Keeley, Sark Davidian,  
Anna Brown, Sarah Hutmacher, Ben Ainley, Tony Garcia, Ed Scott, Merf Solorio

This field was planted with Delta Pine 744 on April 27, 2006 with seed rate of 14 lbs/A. The field was irrigated 3 times using pressure bomb readings of 18-20 bars to better manage plant vigor. In addition, the field received 1 pint of Pix Ultra at first flower and 1 pint of Pix Ultra 2 weeks after first flower.

The first treatment was applied on October 12, when the cotton was at 7 nodes above cracked boll (NACB) and 40-45 percent open boll, with each treatment set to various rates and volumes (Table 1). A second treatment was applied October 19, 2006. All treatments were applied with a Hagie High Cycle sprayer using 8002 nozzles with a 40psi setting. The volume used was 15gal/A with the speed of 4 mph. Defoliation, desiccation, and open boll percentages were visually recorded at 7, 14, and 21 days after treatment (DAT). Five plants per plot were evaluated for terminal and basal regrowth at 21 DAT using a 0-5 scale (verifies number of plants showing regrowth).

At 7 DAT, treatment 9 (Resource 8 oz + Ginstar 6 oz + Finish 12 oz + Agridex 1 pt) showed the highest defoliation with 52 percent. For this rating period, most treatments revealed fairly average percentages, usually around 40-50 percent, with the lowest being treatments 12 (Shark 1 oz + Def 2 pt + Prep 2 pt + Agridex 1 pt) with 42 percent. Treatment 3 (ET 2 oz + Prep 2 pt + Agridex 1 pt) showed the highest desiccation with 55 percent. Most treatments had low to average ratings (20-50 percent). All treatments recorded slightly above average for open boll with percentages ranging from 60 percent to 65 percent. The 2<sup>nd</sup> application, treatment B, was applied at 7 DAT.

At 14 DAT, all treatments displayed high defoliation ratings with the highest being treatments 1 (ET 1.5 oz + Prep 2 pt + Agridex 1 pt followed by ET 2.75 oz + Agridex 1 pt) and 8 (ET 2.75 oz + Prep 2 pt + Ginstar 6 oz + Agridex 1 pt followed by ET 2.75 oz + Agridex 1 pt) with 85 percent and the lowest being treatment 12 (Shark 1 oz + Def 2 pt + Prep 2 pt + Agridex 1 pt followed by Shark 1 oz + Agridex 1 pt) with 68 percent. All other treatments have defoliation percentages ranging from 77 percent to 83 percent. All treatments showed above average desiccation with treatment 10 (Resource 8 oz + Ginstar 10 oz + Finish 12 oz + Agridex 1 pt followed by Resource 6 oz + Gramoxone Inteon 16 oz + Induce 4.8 oz) being the highest at 87 percent and treatment 14 (Shark 1 oz + Def 2 pt + Finish 12 oz + Agridex 1 pt followed by Shark 1 oz + Agridex 1 pt) rated lowest with 50 percent. During this rating period, open boll percentages increased for all treatments with above average rates of 80 percent. Treatments 1 and 7 (ET 2.75 oz + CottonQuik 3 pt + Ginstar 6 oz + Agridex 1 pt followed by ET 2.75 oz + Defol 750 1.6 qt) recorded the highest with 88 percent and treatment 14 the lowest with 80 percent.

At 21 DAT, all treatments showed high defoliation rates ranging from 72 percent to 85 percent. Treatments 1 (ET 1.5 oz + Prep 2 pt + Agridex 1 pt followed by ET 2.75 oz + Agridex 1 pt), 2 (ET 2 oz + Prep 2 pt + Agridex 1 pt followed by ET 2.75 oz + Agridex 1 pt), 6 (ET 2.75oz + CottonQuik 3 pt + Ginstar 6 oz + Agridex 1 pt followed by ET 2.75 oz + Gramoxone Inteon 16 oz + Induce 4.8 oz), 8 (ET 2.75 oz + Prep 2 pt + Ginstar 6 oz + Agridex 1 pt followed by ET 2.75 oz + Agridex 1 pt), and 9 (Resource 8 oz + Ginstar 6 oz + Finish 12 oz + Agridex 1 pt followed by Resource 6 oz + Gramoxone Inteon 16 oz + Induce 4.8 oz) showed the highest defoliation with 85 percent and treatment 12 (Shark 1 oz + Def 2 pt + Prep 2 pt + Agridex 1 pt followed by Shark 1 oz + Agridex 1 pt) had the lowest rating with 72 percent. All treatments also showed above average desiccation rates with treatment 10 (Resource 8 oz + Ginstar 10 oz + Finish 12 oz + Agridex 1 pt followed by Resource 6 oz + Gramoxone Inteon 16 oz + Induce 4.8 oz) being the highest with 87 percent and treatment 14 (Shark 1 oz + Def 2 pt + Finish 12 oz + Agridex 1 pt followed by Shark 1 oz + Agridex 1 pt) as the lowest with 60 percent. All treatments exhibited above average open boll ratings ranging from 80 percent to 90 percent. Treatments 6 and 9 had the highest percentages with 92 percent, followed by treatment 1 with 90 percent. All other treatments were in the 80 percent range. All treatments had a zero rating for both terminal and basal regrowth (Table 2).

## 2006 Defoliation Study in Pima Cotton 2

**Table 1.**

Treatment	Rate pr/A	Timing	Percent Defoliation			Percent Desiccation		
			7 DAT	14 DAT	21 DAT	7 DAT	14 DAT	21 DAT
1. ET + Prep + Agridex B. ET + Agridex	1.5 oz + 2 pts + 1 pt 2.75 oz + 1 pt	7NACB	43	85	85	30	62	80
2. ET + Prep + Agridex B. ET + Agridex	2 oz + 2 pts + 1 pt 2.75 oz + 1 pt	7NACB	47	83	85	43	67	67
3. ET + Prep + Agridex B. ET + Agridex	2.75 oz + 2 pts + 1 pt 2.75 oz + 1 pt	7NACB	50	78	82	55	82	82
4. ET + CottonQuik + Agridex B. ET + Agridex	2.75 oz + 3 pts + 1 pt 2.75 oz + 1 pt	7NACB	47	78	80	40	62	68
5. ET + CottonQuik + Ginstar + Agridex B. ET + Agridex	2.75 oz + 3 pts + 6 oz + 1 pt 2.75 oz + 1 pt	7NACB	50	80	82	50	77	78
6. ET + CottonQuik + Ginstar + Agridex B. ET + Gramoxone Inteon + Induce	2.75 oz + 3 pts + 6 oz + 1 pt 2.75 oz + 16 oz + 4.8 oz	7NACB	45	83	85	45	77	78
7. ET + CottonQuik + Ginstar + Agridex B. ET + Defol 750	2.75 oz + 3 pts + 6 oz + 1 pt 2.75 oz + 1.6 qt	7NACB	48	82	82	35	75	77
8. ET + Prep + Ginstar + Agridex B. ET + Agridex	2.75 oz + 2 pts + 6 oz + 1 pt 2.75 oz + 1 pt	7NACB	47	85	85	38	63	67
9. Resource + Ginstar + Finish + Agridex B. Resource + Gramoxone Inteon + Induce	8 oz + 6 oz + 12 oz + 1 pt 6 oz + 16 oz + 4.8 oz	7NACB	52	82	85	42	82	82
10. Resource + Ginstar + Finish + Agridex B. Resource + Gramoxone Inteon + Induce	8 oz + 10 oz + 12 oz + 1 pt 6 oz + 16 oz + 4.8 oz	7NACB	50	82	82	47	87	87
11. Resource + Def + Finish + Agridex B. Resource + Gramoxone Inteon + Induce	8 oz + 2 pts + 12 oz + 1 pt 6 oz + 16 oz + 4.8 oz	7NACB	48	82	83	45	80	82
12. Shark + Def + Prep + Agridex B. Shark + Agridex	1 oz + 2 pt + 2 pt + 1 pt 1 oz + 1pt	7NACB	42	68	72	22	65	65
13. Shark + Ginstar + Finish + Agridex B. Shark + Agridex	1 oz + 10 oz 12 oz + 1pt 1 oz + 1 pt	7NACB	48	77	77	45	68	73
14. Shark + Def + Finish + Agridex B. Shark + Agridex	1 oz + 2 pt + 12 oz + 1 pt 1 oz + 1pt	7NACB	45	80	80	35	50	60



## 2006 Defoliation Study in Pima Cotton 2

**Table 2.**

Treatment	Rate pr/A	Timing	Percent Open Boll			Regrowth at 21 DAT	
			7 DAT	14 DAT	21 DAT	Terminal	Basal
1. ET + Prep + Agridex B. ET + Agridex	1.5 oz + 2 pts + 1 pt 2.75 oz + 1 pt	7 NACB	63	88	90	0	0
2. ET + Prep + Agridex B. ET + Agridex	2 oz + 2 pts + 1 pt 2.75 oz + 1 pt	7 NACB	62	87	88	0	0
3. ET + Prep + Agridex B. ET + Agridex	2.75 oz + 2 pts + 1 pt 2.75 oz + 1 pt	7 NACB	62	87	88	0	0
4. ET + CottonQuik + Agridex B. ET + Agridex	2.75 oz + 3 pts + 1 pt 2.75 oz + 1 pt	7 NACB	62	82	85	0	0
5. ET + CottonQuik + Ginstar + Agridex B. ET + Agridex	2.75 oz + 3 pts + 6oz + 1pt 2.75 oz + 1 pt	7 NACB	62	85	88	0	0
6. ET + CottonQuik + Ginstar + Agridex B. ET + Gramoxone Inteon + Induce	2.75 oz + 3 pts + 6 oz + 1 pt 2.75 oz + 16 oz + 4.8 oz	7 NACB	62	85	92	0	0
7. ET + CottonQuik + Ginstar + Agridex B. ET + Defol 750	2.75 oz + 3 pts + 6 oz + 1 pt 2.75 oz + 1.6 qt	7 NACB	63	88	90	0	0
8. ET + Prep + Ginstar + Agridex B. ET + Agridex	2.75 oz + 2 pts + 6 oz + 1 pt 2.75 oz + 1 pt	7 NACB	63	87	88	0	0
9. Resource + Ginstar + Finish + Agridex B. Resource + Gramoxone Inteon + Induce	8 oz + 6 oz + 12 oz + 1 pt 6 oz + 16 oz + 4.8 oz	7 NACB	65	87	92	0	0
10. Resource + Ginstar + Finish + Agridex B. Resource + Gramoxone Inteon + Induce	8 oz + 10 oz + 12 oz + 1 pt 6 oz + 16 oz + 4.8 oz	7 NACB	65	82	87	0	0
11. Resource + Def + Finish + Agridex B. Resource + Gramoxone Inteon + Induce	8 oz + 2 pts + 12 oz + 1 pt 6 oz + 16 oz + 4.8 oz	7 NACB	65	83	87	0	0
12. Shark + Def + Prep + Agridex B. Shark + Agridex	1 oz + 2 pt + 2 pt + 1 pt 1 oz + 1pt	7 NACB	60	83	85	0	0
13. Shark + Ginstar + Finish + Agridex B. Shark + Agridex	1 oz + 10 oz 12 oz + 1pt 1 oz + 1 pt	7 NACB	60	83	83	0	0
14. Shark + Def + Finish + Agridex B. Shark + Agridex	1 oz + 2 pt + 12 oz + 1 pt 1 oz + 1pt	7 NACB	60	80	85	0	0

Five plants per plot were evaluated for terminal and basal new growth using a 0-5 rating scale. The 0 to 5 numbers represent the number of plants in sample showing regrowth i.e. 3 = 3 of the 5 plants are showing regrowth.