

# Defoliation Research on Pima and Upland Cotton at the Marana Agricultural Center in 1993

*J.M. Nelson, G.F. Barney and G.L. Hart*

## **Abstract**

*A field study was conducted at the Marana Agricultural Center to evaluate the effectiveness of ground rig applied defoliant treatments on Pima and upland cotton under cool weather condition. The experimental defoliant Ginstar and the combination treatment of Dropp + Def resulted in good defoliation 14 days after application.*

## **Introduction**

There has been a lack of information on defoliation strategies for Pima and upland cotton in the Marana area. In the past, the main strategies for preparing cotton for harvest were to defoliate with chlorate or wait until frost killed the leaves. Chlorate has generally given variable defoliation results and has at times resulted in a high percentage of desiccation when used on Pima cotton at this location. Relying on frost as defoliation method has many disadvantages.

Recently, there has been increased interest in the Marana area in the use of other defoliants such as Dropp and Def. A test at the Marana Agricultural Center in late October of 1991 indicated that combinations of defoliants such as Dropp + Def or Dropp + Def + Accelerate can be used to obtain good defoliation (Nelson and Silvertooth, 1992).

One problem that has developed in the Marana area is that there has been widespread public sentiment against aerial application of pesticides, including defoliants. This has caused increased interest in the use of tractor mounted sprayers to apply defoliants. This past season it was again our objective to evaluate chemical defoliation treatments at Marana using ground rig application.

## **Materials and Methods**

Seed of Pima S-7 and DP5415 cotton was planted at the Marana Agricultural Center on 20 April 1993 in moist soil. The plantings received 200 lbs./acre of 16-20-0 fertilizer preplant and 50 lbs. of N/acre during the growing season. The final irrigation was on 10 September. Defoliation treatments were applied with a HiBoy sprayer using 7 nozzles/row on 26 October. The total spray volume was 20 GPA. Treatments are described in Tables 1 and 2. Plots were 4 rows wide by 38 ft. long. These tests utilized randomized complete block designs with 4 replications. Plots were visually rated for leaf drop by 2 persons 7 and 14 days after application of treatments.

Maximum and minimum temperatures averaged 80 and 45°F, respectively, for the 14 day evaluation period. Although night temperatures were low, no frost occurred at this location prior to or 14 days after treatments were applied. During the 14 day period after application of defoliants there was no rainfall and 138 HU were accumulated.

## Results and Discussion

Results of the Marana tests are shown in Tables 1 and 2. Natural defoliation for the Pima and upland cottons at the time treatments were applied was estimated to be 55 and 60%, respectively. In these tests, the response to defoliation was slow. Temperatures were cool and only 138HU were accumulated during the 14 day period after defoliant was applied.

Defoliation treatments showed very little effect on Pima Cotton 7 days after defoliation, but by 14 days several treatments had resulted in acceptable defoliation (Table 1). The higher rates of Ginstar and Dropp + Def treatments gave the highest defoliation percentages.

In the test with upland cotton, there were no differences among treatments 7 days after application (Table 2). All but one treatment provided good defoliation (>70%) after 14 days.

Based on tests conducted at Marana this year and past years, it appears that Ginstar and the combination treatment, Dropp + Def, will give good defoliation in a single ground rig application.

## References

Nelson, J.M and J.C. Silvertooth. 1992. Defoliation research on Pima and upland cotton at the Marana Agricultural Center in 1991. Cotton, A College of Agriculture Report. University of Arizona, Series P-91:307-309.

**Table 1. Defoliation test on Pima S-7 cotton.**

Treatments <sup>1</sup>	Rate (lbs. a.i./A)	Defoliation (%)	
		7 days	14 days
01 Ginstar SN597 <sup>2</sup>	0.10	63a <sup>7</sup>	77a
02 Ginstar SN597 <sup>2</sup>	0.15	58a	78a
03 Ginstar SN597 <sup>2</sup>	0.188	65a	86a
04 Ginstar SN597 <sup>3</sup>	0.10	57a	62b
05 Dropp + Def <sup>4</sup>	0.10 + 0.75	62a	85a
06 Dropp + Def <sup>5</sup>	0.10 + 0.75	58a	75a
07 XP3-559B <sup>4,6</sup>	1.875	57a	55b
08 TD-2335 + Ammonium Sulfate <sup>4,6</sup>	0.75 + 10.0	60a	57b

<sup>1</sup> Treatments were applied on 26 October at a total volume of 20 GPA.

<sup>2</sup> Ginstar SN597 is an experimental Nor-Am formulation.

<sup>3</sup> Treatment 04 was applied with 1/2 pt./A Kinetic.

<sup>4</sup> Treatments 05, 07 and 08 were applied with 1 pt./A Agri-Dex.

<sup>5</sup> Treatment 06 was applied with 1 pt./A Detur.

<sup>6</sup> XP3-559B and TD-2335 are experimental Elf Atochem North America formulations.

<sup>7</sup> Means in columns followed by the same letter are not significantly different at the 0.05 probability level.

**Table 2. Defoliation test on DP5415 cotton.**

Treatments <sup>1</sup>	Rate (lbs. a.i./A)	Defoliation (%)	
		7 days	14 days
01 Ginstar SN597 <sup>2</sup>	0.10	61a <sup>7</sup>	88a
02 Ginstar SN597 <sup>2</sup>	0.15	64a	87a
03 Ginstar SN597 <sup>2</sup>	0.188	63a	91a
04 Ginstar SN597 <sup>2,3</sup>	0.10	64a	83a
05 Dropp + Def <sup>4</sup>	0.10 + 0.75	69a	89a
06 Dropp + Def <sup>5</sup>	0.10 + 0.75	63a	84a
07 XP3-559B <sup>4,6</sup>	1.875	63a	69b
08 TD-2335 + Ammonium Sulfate <sup>4,6</sup>	0.75 + 10.0	62a	80a

<sup>1</sup> Treatments were applied on 26 October at a total volume of 20 GPA.

<sup>2</sup> Ginstar SN597 is an experimental Nor-Am formulation.

<sup>3</sup> Treatment 04 was applied with 1/2 pt./A Kinetic.

<sup>4</sup> Treatments 05, 07 and 08 were applied with 1 pt./A Agri-Dex.

<sup>5</sup> Treatment 06 was applied with 1 pt./A Detur.

<sup>6</sup> XP3-559B and TD-2335 are experimental Elf Atochem North America formulations.

<sup>7</sup> Means in columns followed by the same letter are not significantly different at the 0.05 probability level.