Cottonseed Treatment Evaluations in Arizona, 1989

J. C. Silvertooth and J. E. Malcuit

INTRODUCTION

Seedling diseases in cotton (Gossypium spp.) can often be a serious problem in obtaining and maintaining a satisfactory stand. As a precautionary measure, many commercial cottonseed suppliers provide a seed treatment to protect against soil-borne fungal organisms that can potentially cause seedling disease problems. Seedling disease pressures commonly vary from field to field, and from season to season. However, in terms of evaluating cottonseed treatments of this type, in-field evaluations often are desired.

In 1989, two field experiments were carried out in southern Arizona to evaluate the effectiveness of seven seed treatments, with an untreated check, on a given lot of Upland (G. hirsutum L.) cottonseed.

METHODS

A single field experiment was established at the University of Arizona Marana Agricultural Center on a Pima clay loam (fine-silty, mixed, thermic Typic Torrifluvent). A second field experiment also was established at the University of Arizona Safford Agricultural Center on a Grabe clay loam (coarse-loamy, mixed Typic Thermic Torrifluvent). The Marana experiment was planted into moisture and capped on 14 April, 1989. At the time of planting, soil temperatures at seeding depth were 63#Fand 58#Fat Marana and Safford, respectively, at 8:00 a.m. In both experiments, all plots were four (40-inch) rows wide and 40 feet in length. Exactly 200 seeds were planted in each 40-foot row with appropriately treated seeds. Each experiment consisted of eight total treatments (Table 1) arranged in a randomized complete block design with four replications.

Each seed treatment was applied to a common lot of Delta and Pine Acala 90 seed with a slurry rate of 800 cc/CWT. The check treatment (Treatment No. 1, Table 1) had no seed treatment whatsoever.

Stand counts were made on all plots by counting the number of emerged plants per 40 foot of row. Percent emergence was calculated on the basis of 200 total seeds per 40 foot of row. Percent emergence data was then used as a dependent (response) variable in an analysis of variance procedure where replications and treatments were used as independent or class variables. Separation of means was considered by use of a Fisher's LSD in accordance with the observed significance level (probability of a greater F value).

RESULTS

Stand emergence results for each treatment are shown for the Marana and Safford experiments in Tables 2 and 3, respectively. As evidenced by the means presented in these tables, no differences among treatments were detected at either location in 1989. Visual assessment of plant vigor and health in general, revealed very healthy plants in all plots on the date of final stand counts and again by observation on 16 May at Safford and 22 May at Marana.

Weather conditions in Arizona in the spring of 1989 were very warm and exceptionally good for cotton growing conditions. This is particularly true with regard to stand establishment. The information shown in Tables 4 and 5 is somewhat indicative of these favorable conditions. For the time period between planting and final stand counts, one can see that in comparison to historical weather patterns for these locations that Marana accumulated

33 heat units and Safford accumulated 99 heat units above "normal." One can also see by comparison that conditions at planting were much warmer than would normally have been predicted by historic weather data. For future experiments, planting as close to the earliest legal planting date at both locations (15 March at Marana and 1 April at Safford) would be a desired practice in the context of these experimental objectives.

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Table 1. Treatments used in the 1989 seed treatment evaluation experiments in Arizona.*

Treatment	Chemical Formulation	Rates - fluid oz./CWT -
1	untreated control	
2	Vitavax PCNB Apron FL (N)	6.0 0.75
3	Vitavax PCNB Agron FL (N) Baytan 30 (X-6B11)	6.0 0.75 0.25
4	Vitavax PCNB Apron FL (N) Baytan 30 (X-6B11)	6.0 0.75 0.50
5	Vitavax PCNB Apron FL (X-nS11) Baytan 30 (X-6B11)	6.0 0.75 0.50
6	Vitavax PCNB Captan 400	6.0 3.0
7	Nuflow ND	7.50
8	Nuflow ND	15.00

*All materials applied in a slurry at a rate of 800 cc/CWT on a common lot of DPL-Acala 90 cottonseed.

Table 2. Percent emergence means taken from respective treatment areas at Marana, AZ, on 28 April, 1989.*

Treatment No.	Mean Emergence per Row --------%--------
1	58
2	58
3	63
4	56
5	62
6	60
7	62
8	60
$LSD_{0.05}$	NS
CV	8.4

*All plots planted on 14 April, 1989. 200 seeds planted per 40 foot row.

Table 3. Percent emergence means taken from respective treatment areas at Safford, AZ, on 18 April, 1989.*

Treatment No.	Mean Emergence per Row
	-----%-----
1	54
2	54
3	50
4	55
5	54
6	54
7	48
8	52
$LSD_{0.05}$	NS
CV	13

*All plots (watered up) on 3 April, 1989. 200 seeds planted per 40-foot row.

Table 4. Accumulated heat units (86/55F) at Marana and Safford at planting and sampling dates in 1989.=

Location	At Planting*	At Sampling*	Period Total**
	-----	Heat Units	-----
Marana	802	1034	232
Safford	467	699	232

*Total accumulated since 1 January, 1989.
**Total accumulated from planting to sampling.
=Planting Dates: Marana, 14 April
Safford, 3 April

Sample Dates: Marana, 28 April
Safford, 18 April

Table 5. Accumulated heat units at each location, for respective periods (calendar date), based on long-term historical weather data.#

Location	At Planting*	At Sampling*	Period Total**
	---------- Heat Units ----------		
Marana	701	900	199
Safford	303	436	133

*Total accumulated since 1 January, 1989.
**Total accumulated from planting to sampling.
Planting Dates: Marana, 14 April
Safford, 3 April

Sample Dates: Marana, 28 April
Safford, 18 April