

TEXAS ROOT ROT  
CONTROL TEST  
Test #3

CROP HISTORY

Treatment	Turnout <sup>1/</sup> &	Agent in Charge Jim Armstrong	
		Plants/A X 1000	Lint lbs./A
Salt 1850 lbs./A	34.01	60.6a <sup>2/</sup>	879a <sup>2/</sup>
Check	33.12	57.0a	693a
Salt 1900 lbs./A 1977	27.62	50.0	521

1/ Turnout percentages are based on laboratory gin results.

2/ Values followed by the same letter are not significantly different at the .05 level by the Student-Newman-Kuel's Test.

SOIL TYPE: Sandy. PREVIOUS CROP. Cotton. PLANTING: May 16 at 15 lbs./A in moisture under cap. HERBICIDE: Caparol at ½ lb/A as a chemical hoe, Layby on July 25 with 1.4 lb/A Caparol. FERTILIZER: Preplant: 100 lbs./A of 18-40-6, Layby: water run with NH<sub>3</sub>. IRRIGATION: 1 preplant irrigation + 6 more irrigations ending on September 11. INSECTICIDE: Application on September 5 at 1 qt. and ½ lb./A of Paratox + Lannate for plant bugs. Application on September 27 at ½ lb/A of Lannate for perforator. DEFOLIATION: 1 1/3 gal./A of Sodium Chorate on October 18. HARVEST: November 7.

Phymatotrichum Root Rot

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One objective of our field studies during 1978 was to determine if deep placement of anhydrous ammonia prior to planting would reduce the incidence of Phymatotrichum root rot in cotton. This work was supported by a grant from Cotton Incorporated and was initiated primarily because of encouraging results reported from Texas by S. D. Lyda. Observations were also made on the use of sodium chloride as a pre-plant treatment for disease control.

Field plots were established in cooperation with county agents in Pinal County (Sam Stedman), Graham County (Ron Cluff), and Pima County (Jim Armstrong). Yields were taken at two locations in Marana and one location in Safford where disease incidence was high. Observations were made on disease incidence periodically through the season. All plots were aerially photographed with infrared film on September 20, 1978.

Ammonia Study - Ammonia gas is known to be fungicidal to Phymatotrichum omnivorum, the fungus causing cotton root rot. The most encouraging results occurred in the Safford test (See Table 1) where anhydrous ammonia was applied to a depth of approximately 16" with a Big-Ox plow with the shanks set 20" apart. Considerable disease developed in the plots and there was some increase, although not statistically significant, in yield in the plots with 120 lbs/NH<sub>3</sub> and 240 lbs/NH<sub>3</sub>/acre.

In the Marana area (See Table 2), anhydrous ammonia was allied only in the furrow. There was a slight increase in lint at 200 lbs NH<sub>3</sub>/A in one test and no increase in yield at 300 lbs/NH<sub>3</sub>/A in another test.

A large test along the Gila River in Florence (40 acres, deep-placement, shanks set at 19", 200 and 250 lbs NH<sub>3</sub>/A; and 40 acres check) yielded no information because of low disease incidence and obscuring of results because of high incidence of Verticillium wilt.

Two observational plots in Florence and Coolidge (Big-Ox plows, 200-250 lbs NH<sub>3</sub>/A, 16" depth, pre-plant), check strips (no NH<sub>3</sub>) in center of field, were inconclusive. There was a stimulation of plant growth in the ammonia treated portions of the field but the number of dead plants was similar.

NaCl Tests - It should be emphasized that high soil sodium apparently reduces the ability of Phymatotrichum to produce survival structures. Thus, the effect of salt additions should be noticed the year after application and not during the year of application.

In a test at Coolidge, approximately 1500 lbs/A sodium chloride was applied on the surface, disced in, and then the beds shaped. One strip, approximately 80' width, was left as a check. There was no detrimental effect of the salt on stand or water penetration. No effect, as expected, was noted on disease incidence.

In another sodium chloride test at Marana (Table 3) there was no effect on disease in cotton planted into an area treated with 1900 lbs/A of sodium chloride in 1977. Also, as expected, an addition of 1850 lbs/A of sodium chloride (applied on the flat, beds then shaped) had no effect on yield or disease incidence.

Conclusions - Further tests with deep placement of anhydrous ammonia will be made only with equipment that will enable deep placement (16-18") of anhydrous ammonia with shank settings, of no more than a 20". Evaluations are presently being made to determine the effectiveness of earlier applications of anhydrous ammonia on disease control. Further studies on sodium chloride will be made. In all tests the sodium chloride will be spread on the flat, disced into the soil, and then the beds shaped.

Table 1. Phymatotrichum Root Rot Control Test - 1978

Norman Welker - Graham County

Agent-in-Charge - Ron Cluff'

Treatment	Seed Cotton Yield Pounds per Acre
120 lb/A NH <sub>3</sub>	2343 a <sup>1/</sup>
240 lb/A NH <sub>3</sub>	2145
Check	2096 a

<sup>1/</sup>

Values followed by the same letter are not significantly different at the .05 level by the Student-Newman-Keul's Test.

C.V. = 11.14%

CROP HISTORY: SOIL TYPE: Clay Loam. PREVIOUS CROP: Cotton. LAND PREPARATION: Plow, sub-soil, and list. VARIETY: Pima S-5. PLANTING: April 22 at 23 lbs/A in moisture under a cap. HERBICIDE: None. FERTILIZER: Only that of the test treatments. NH<sub>3</sub> was injected preplant with a Big-Ox chisel to 19" deep, using 7 shanks on 19" centers. IRRIGATION: Preirrigated on March 30 with 1.0 AF plus 6 more irrigations on alternate rows, ending September 13. Total water use 4 AF. DEFOLIATION: None. HARVEST: December 14.

Table 2. Texas Root Rot Control Test

Calyco Farms  
 Pete Hershberger - Marana Agent-in-Charge - Jim Armstrong

Treatment	Turnout <sup>1/</sup> %	Lint lbs/A	Plants/A x 1000
NH <sub>3</sub> 200 lbs/A	33.58	973 a <sup>2/</sup>	33.0 a <sup>2/</sup>
Check	33.43	935 a	33.0 a
Salt 1750 lbs/A	31.43	847 a	32.0 a
C.V.: Stand = 13.13%; Yield = 14.90%			
Check	32.77	444 a	38.6 a
NH <sub>3</sub> 100 lbs/A	32.10	433 a	34.0 a
NH <sub>3</sub> 300 lbs/A	31.46	417 a	30.6 a

<sup>1/</sup> Turnout percentages are based on laboratory gin results.

<sup>2/</sup> Values followed by the same letter are not significantly different at the .05 level by the Student-Newman-Keul's Test.

C.V.: Stand = 11.18%; Yield = 9.11%.

CROP HISTORY: SOIL TYPE: Sandy Loam. PREVIOUS CROP: Cotton. TILLAGE: Plowed 14 inches. PLANTING: May 23 at 17 lbs/A in moisture under a cap. HERBICIDE: Caparol and Cobex at 1 1/4 lb. and 1 pt. per acre in a 12 inch band after planting and before placing the seed cap. Layby with Karmex at 1 1/2 lbs. per acre incorporated 2 inches with rolling cultivator. SPOT SPRAYING: NSMA on grass, when 12 to 15 inches in height. FERTILIZER: Layby with 115 units of NH<sub>3</sub> water run. IRRIGATION: 1 preplant irrigation of 1.7 acre feet + more irrigations ending September 5. Total water use 3.4 acre feet. INSECTICIDE: Application on September 4, 1/3 gal. per acre of Paratox 3-6 for pink bollworm. DEFOLIATION: 2 gal/A of Sodium Chloride on October 11. HARVEST: November 8.

Table 3. Texas Root Rot Control Test

Art Pacheco - Marana

Agent-in-Charge - Jim Armstrong

Treatment	Turnout <sup>1/</sup> %	Lint lbs/A	Plants/A x 1000
Salt 1850 lbs/A	34.01	879 a <sup>2/</sup>	60.6 a <sup>2/</sup>
Check	33.12	693 a	57.0 a
Salt 1900 lbs/A (1977)	27.62	538	50.0

<sup>1/</sup>

Turnout percentages are based on laboratory gin results.

<sup>2/</sup>

Values followed by the same letter are not significantly different at the .05 level by the Student-Newman-Keul's Test.

C.V.: Stand = 25.49%; Yield = 15.89%

CROP HISTORY: Sandy. PREVIOUS CROP: Cotton. PLANTING: May 16 at 15 lbs/A in moisture under cap. HERBICIDE: Caparol at 1/2 lb/A as a chemical hoe, Layby on July 25 with 1.4 lb/A Caparol. FERTILIZER: Preplant: 100 lbs/A of 18-40-6, Layby: water run with NH<sub>3</sub>. IRRIGATION: 1 preplant irrigation + 6 more irrigations ending on September 11. INSECTICIDE: Application on September 5 at 1 qt. and 1/4 lb/A of Paratox + Lanate for plant bugs. Application on September 27 at 1/4 lb/A of Lanate for perferator. DEFOLIATION: 1 1/3 gal/A of Sodium Chlorate on October 18. HARVEST: November 7.