

Planting Seed

Cotton Seed Treatment, Greenlee County, 1986

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ABSTRACT

Six different seed treatments and one in-furrow granular treatment were used in a field with a history of black root rot, caused by Thielaviopsis basicola. The treatment was a follow-up on the study done the previous year (1). Stand counts, root lengths and seed cotton yields were taken to see if any of the treatments increased stand counts or stimulated root growth. Thielaviopsis was not isolated in the plants this year, so the effect of the fungicides on this pathogen were not evaluated. Stand counts were, however, significantly influenced by the seed treatments.

INTRODUCTION

In the previous year NU-Zone, a seed treatment containing Imazalil, seemed to increase stand counts and stimulate root growth in cotton infected by Thielaviopsis, but was not able to control the organism where heavy infestations occurred. This year, higher concentrations and different formulations were used to see if control could be achieved.

MATERIALS AND METHODS

SOIL TYPE:	Pima silty clay loam
PREVIOUS CROP:	Cotton
PLANTING:	Date: 11 April 1986 Rate: 15 lbs/ac
PLOT SIZE:	Six rows wide by approximately 1100 feet long
EXPERIMENTAL DESIGN:	Randomized complete block
HARVEST:	22 October

Two different lots of Acala 1517-75 cotton were used. One was treated with vitavax plus captan; the other was treated with Nu-Flow plus Nu-Zone. Imazalil was added as a hopper box treatment (Nu-Zone Hopper Box by Wilbur-Ellis) and as a liquid (Fungiflor from Janssen Pharmaceutica). Seed were placed in a tub; the Imazalil was dusted or sprayed over the seed; the seed was mixed. This step was repeated until all the material was applied and uniformity was achieved.

The treatments were as follows:

1. N-Flow + N-Zone
2. N-Flow + N-Zone + 5.5 oz/cwt N-Z HB (Hopper Box)
3. Vitavax + Captan
4. Vitavax + Captan + 5.5 oz/cwt N-Z HB
5. Vitavax + Captan + 11 oz/cwt N-Z HB
6. Vitavax + Captan + 2 oz/cwt Fungiflor

Treatments 1 and 2 were one seed lot, 3-6 were the other.

A 5% granular formulation of Imazalil, Fecundal 5FG (from Janssen Pharmaceutica) was placed in-furrow at planting time in one row of each treatment through the area most likely to be infested with Thielaviopsis, at a rate of 0.5 lbs/ac a.i.

RESULTS AND DISCUSSION

Table 1. Plants per 8 feet of Row for Each Treatment, Averaged over Four Replications and over the Three Counting Dates (28 April, 6 May and 22 May).

Treatment	Stand count (plants/8 feet of row)*	
	Over five rows**	In-furrow row only
N-F + N-Z	30.5 a	30.8 a ⁻ Lot
N-F + N-Z + 5.5 oz NZHB	27.9 b	25.9 b ₁
Vita + cap	23.3 d	24.8 b ⁻
Vita + cap + 5.5 oz NZHB	25.0 c	25.0 b Lot
Vita + cap + Fungiflor	25.3 c	26.2 b 2
Vita + cap + 11 oz NZHB	25.1 c	28.2 ab ₁

* Values with the same letter are not statistically different at the 5% level using the Student-Newman-Keul's test.

** This column contains stand counts on all rows in the plot except the row which had in-furrow imazalil granules.

The statistics were run separately on the two columns so no significant relationship is inferred by the letters in column 1 compared with column 2. The values in column 1 are an average of 60 measurements, whereas the values in column 2 come from only 12 measurements.

In seed lot 1, the presence of 5.5 oz/ac of Nu-Zone Hopper Box decreased the stand; the presence of the granular in-furrow treatment appeared to lower the stand even more. In seed lot 2, the stands were significantly increased by the presence of Imazalil, in all forms and rates. The highest stand count was with the highest rate of Imazalil on the seed plus the in-furrow treatment. No apparent explanation is available for these differences between seed lots. To see if Imazalil stimulated root growth, root lengths were measured and recorded in Table 2.

Table 2. Average Root Lengths in Centimeters from where the Stem Emerged from the Soil to the Root Tip, Measured on 22 May.

Treatment only	Root length in centimeters*		
	Over five rows**	In-furrow	row
N-F + N-Z	22.1 a	19.6 a	Lot
N-F + N-Z + 5.5 oz NZHB	20.2 a	19.9 a	1
Vita + cap	20.7 a	20.5 a	
Vita + cap + 5.5 oz NZHB	19.6 a	16.0 a	Lot
Vita + cap + Fungiflor	20.4 a	18.8 a	2
Vita + cap + 11 oz NZHB	19.5 a	20.1 a	

* Values with the same letter are not statistically different at the 5% level using the Student-Newman-Keul's test.

** This column contains root lengths from all rows in the plot except the row which had in-furrow imazalil granules.

There were no statistically significant differences between the root lengths. So, it appears that Imazalil does not stimulate root growth as was speculated in last years study, but merely allows the root to continue to grow where Thielaviopsis would normally have stunted it.

Table 3. Seed Cotton Yields in Pounds per Acre from Treated Plots Excluding the Rows with In-furrow treatments.

Treatment	Seed cotton yields*
N-F + N-Z	2484.9 a
N-F + N-Z + 5.5 oz NZHB	2597.9 a
Vita + cap	2581.4 a
Vita + cap + 5.5 oz NZHB	2288.8 a
Vita + cap + Fungiflor	2292.8 a
Vita + cap + 11 oz NZHB	2001.1 a

* Values with the same letter are not statistically different at the 5% level using the Student-Newman-Keul's test.

Again, no significant differences were seen. But, perhaps something important is shown. The cotton plant can compensate for small differences in stand by modifying its growth pattern.

REFERENCES

1. L.J. Clark et al. 1986. Seed treatment to prevent black root rot. Cotton, a College of Agriculture Report. University of Arizona. pp.179ff.