

# Telone II® Following Grain Rotation for Nematode Control?

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## Abstract

*Six field trials were conducted between 1994 and 1996 in Buckeye and Gila Bend, Arizona to determine the effect of soil fumigation with Telone II on the yield of cotton following rotation with Durham wheat. Telone was shank injected at two or more rates (0, 3, or 5 gal/acre) in fields previously maintained with a cotton-wheat-summer/winter fallow rotation. Five fields were planted to Upland and one field to Pima cotton. Four of the six trials resulted in an average lint yield increase of 180 lint lbs/ac compared to the untreated controls. In one trial where all three rates were compared, yield at the 5 gallon rate was increased 141 lint lbs/ac compared to the 3 gallon rate and the control. In two of the trials none of the treatments differed significantly.*

## Introduction

Root-knot nematode infestations can cause economic yield losses of cotton when left untreated. A statewide nematode survey conducted by M.A. McClure several years ago indicated that over 50% of the land used for cotton production in Maricopa County had detectable root-knot nematode populations. Generally, producers recognize the potential decrease in lint yield as a result of nematodes and can identify the infested fields within a farm or a region. Many producers fumigate with Telone II after multiple years of continuous cotton in the known areas of nematode pressure. When a known nematode infested field is rotated out of cotton, Telone II may be omitted in the first year of resumed cotton production. The objective of our multi-year, multi-site field studies is to evaluate possible nematode effects on first year cotton following a grain rotation. All of the 6 field studies reported here consisted of a rotation with a summer grain followed by a winter fallow prior to cotton.

## Materials and Methods

Field studies were conducted from 1994-96 at six locations with five in Buckeye, Az. (H-Four Farms, Roosevelt Irrigation District) and one on the Paloma Ranch (Gingg Farms) in Gila Bend, Az. Plots were 12 rows wide running the entire field length of 1250 feet. Five of the sites consisted of alternated untreated checks and Telone II treatments (5 gal./acre) for a minimum of 4 replications. The sixth site consisted of an untreated check, 3 gal./acre, and 5 gal./acre with treatments alternating and replicated four times.

Soil samples for initial nematode populations were taken at the 1996 field study sites with the objective of developing treatment threshold recommendations. Samples had undetectable levels of root-knot nematode juveniles on the pre-

application basis. The center four rows of each twelve row plot were harvested and the data were subjected to Analysis of Variance.

## **Results and Discussion**

Four of the six field studies resulted in an average increase of 180 lb. lint lbs/acre in the Telone II treated plots. The remaining 2 sites resulted in no yield differences between Telone II treated plots and untreated checks. In addition, the Paloma site in 1996 resulted in a lint increase of 141 lb./acre with the 5 gal. rate with no significant differences between the untreated check and the 3 gal. Telone II rate (Table 1). The data indicate that reducing Telone II rates below the recommended label is economically disadvantageous.

The data do not offer guidelines relevant to pre-plant nematode levels for application threshold purposes. Further testing will be conducted in 1997 with detailed gridwork soil sampling on a pre-plant basis in an attempt to develop the desirable threshold levels to make well informed decisions. The information contained within this report is primarily intended to offer valid data which indicate that fields with known historic high nematode populations may benefit economically from fumigation with the above described rotation.

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**Table 1. 1994-96 Telone tests lint yields on Upland and Pima cotton.**

<b><u>Pima 1994</u></b>	<b><u>Lint lbs/Acre</u></b>
Untreated	1312 b
Treated (5gal/Acre)	1346 a
	C.V. 2.95, LSD 31
<b><u>Upland 1994</u></b>	<b><u>Lint lbs/Acre</u></b>
Untreated	1258 b
Treated (5gal/Acre)	1495 a
	C.V. 6.67, LSD 45
<b><u>Upland 1995</u></b>	<b><u>Lint lbs/Acre</u></b>
Untreated	1149 a
Treated (5gal/Acre)	1122 a
	C.V. 7.8, LSD 45.8
<b><u>Upland 1996</u></b>	<b><u>Lint lbs/Acre</u></b>
Untreated	1082 b
Treated (5gal/Acre)	1300 a
(Baseline)	C.V. 4.60, OSL 0.0111
<b><u>Upland 1996</u></b>	<b><u>Lint lbs/Acre</u></b>
Untreated	1171 b
Treated (5gal/Acre)	1297 a
(Broadway)	C.V. 2.92, OSL 0.015
<b><u>Upland 1996</u></b>	<b><u>Lint lbs/Acre</u></b>
Untreated	1240 b
Treated (3gal/Acre)	1298 b
Treated (5gal/Acre)	1381 a
(Paloma-Byers)	C.V. 3.24, OSL 0.0094

**C.V. = Coefficient of Variation**

**LSD = Least Significant Difference**

**OSL = Observed Significance Level**

**\* Means followed by the same letter are not significantly different following a significant Analysis of Variance Test ( $P \leq 0.05$ ).**