EVALUATION OF TELONE II® SOIL FUMIGANT AND TWO NEMATODE RESISTANT COTTON VARIETIES IN LOUISIANA

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Abstract

The site specific application of Telone II® soil fumigant for control of nematodes in cotton production has been shown to be a cost effective practice in Louisiana. Root-knot nematodes are confined to sandier soils while reniform nematodes can live in soils with higher clay content. The location in the field and the species of nematodes present can be obtained from a routine soil sample. Crop rotation with corn for one to two years can help lower reniform nematode populations to manageable levels, but in the case of root-knot nematodes, corn serves as a host crop. The advances in cotton breeding programs have produced varieties that have various levels of nematode resistance. This trial focused on the use of Telone II in combination with two nematode resistant cotton varieties and a non-resistant variety. Nematode samples for identification and population were taken along with NDVI (Normalized Difference Vegetation Index) readings, and harvest results.

Materials and Methods

In 2014 two trials were initiated in Tensas Parish in Northeast Louisiana. The field locations were in St. Joseph and Waterproof. The soil types for each field were Commerce Silt Loam in St. Joseph and Bruin Silt Loam, Commerce Silt Loam and Tunica Clay in Waterproof. Electrical conductivity (Ec) data was collected at the St. Joseph location. The data was separated into two deep Ec zones. Normalized Difference Vegetative Index (NDVI) was taken in both fields on July 1, 2014 with a high clearance sprayer equipped with Trimble Greenseeker NDVI sensors. Nematode samples were taken after harvest to determine nematode species and populations. Harvest data was taken with John Deere cotton pickers and yield monitors. The individual yield data from the yield monitors was calibrated to actual weights of seedcotton from each variety at harvest. Yield analysis was done in ArcMap GIS software.

Results

Table 1. Reniform nematode counts taken in the fall of 2014 at St. Joseph. There were no Root-Knot nematodes present in the field in 2014.

	Reniform	
Variety	No Telone	Telone
	per pint of soil	
STV 5288 B2F	64,000	59,060
PHY PX300310 WRF	46,127	34,160

Table 2. Reniform nematode counts taken in the fall of 2014 at the Waterproof location.

Variety	Reniform	
	No Telone	Telone
	per pint of soil	
STV 5288 B2F	10,260	8,273
PHY 427 WRF	9.482	14,240

Table 3. Root-Knot nematode counts taken in the fall of 2014 at the Waterproof location.

Variety	Reniform	
	No Telone	Telone
	per pint of soil	
STV 5288 B2F	2,626	604
PHY 427 WRF	340	673

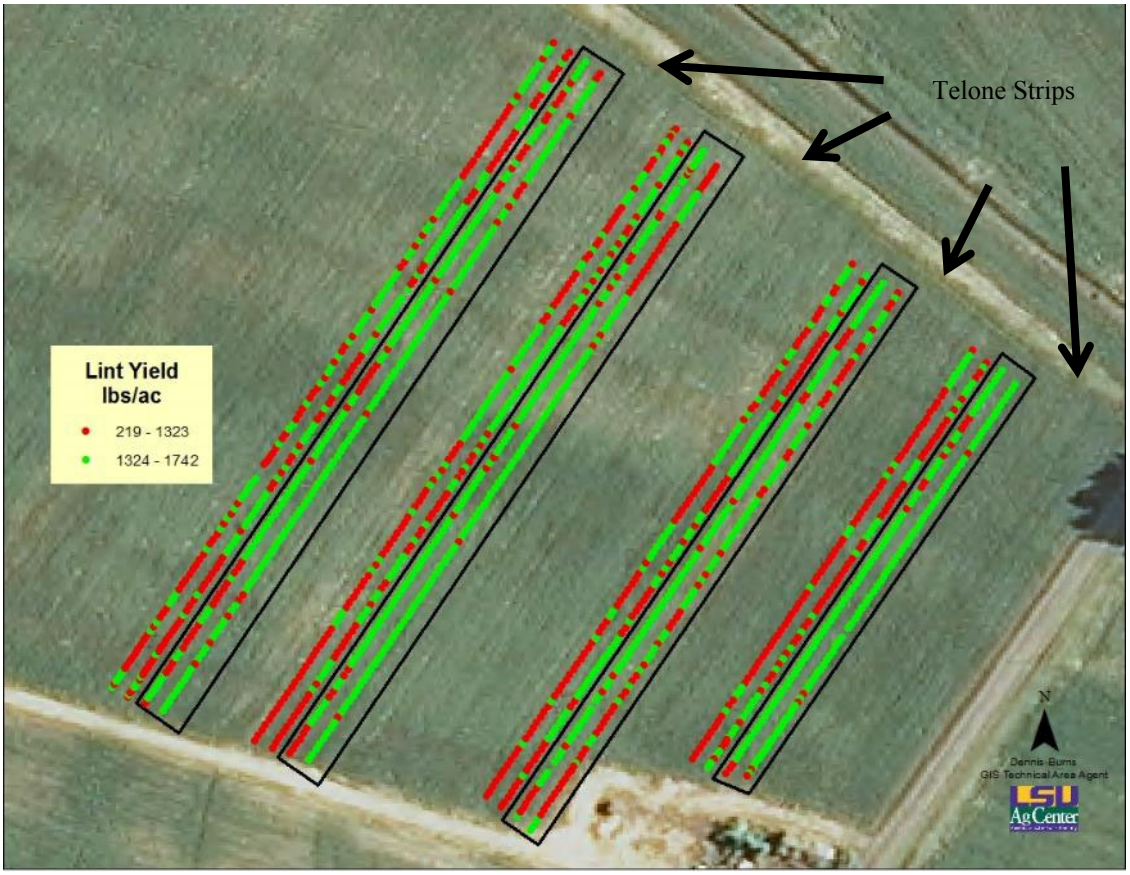

Figure 1. St. Joseph trial layout of the variety and Telone II application strips. The Farmer Standard variety, STV 5288B2F, was planted on the outside passes of each the set of four passes per rep. The Phytogen PX300310 variety was planted in the two center passes.

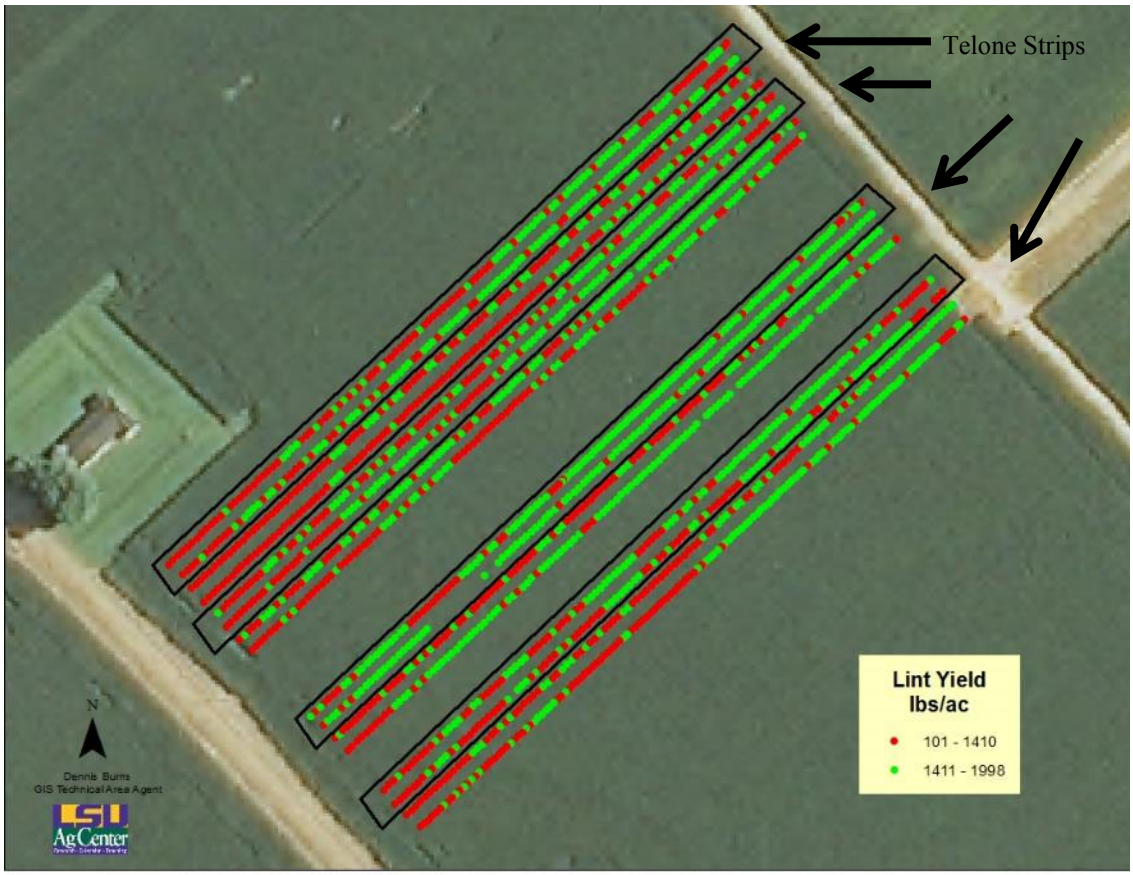

Figure 2. Waterproof trial layout of the variety and Telone II application strips. The Farmer Standard variety, STV 5288 B2F, was planted on the outside passes of each the set of four passes per rep. The Phytogen 427WRF variety was planted in the two center passes.

Table 4. Cotton lint yields by treatment and soil Ec zone at St. Joseph in 2014.

	Cotton Lint Yields									
			Shallow Ec				Deep Ec			
	Whole Strip		1		2		1		2	
Variety	Telone	None	Telone	None	Telone	None	Telone	None	Telone	None
	---------- lbs/acre ----------									
Dow Px 300310WRF	1399.6	1310.1	1381.8	1284.0	1415.6	1334.4	1391.7	1304.5	1438.9	1347.1
Stoneville 5288	1395.5	1279.6	1404.6	1269.6	1386.2	1286.8	1388.2	1282.0	1426.0	1267.2

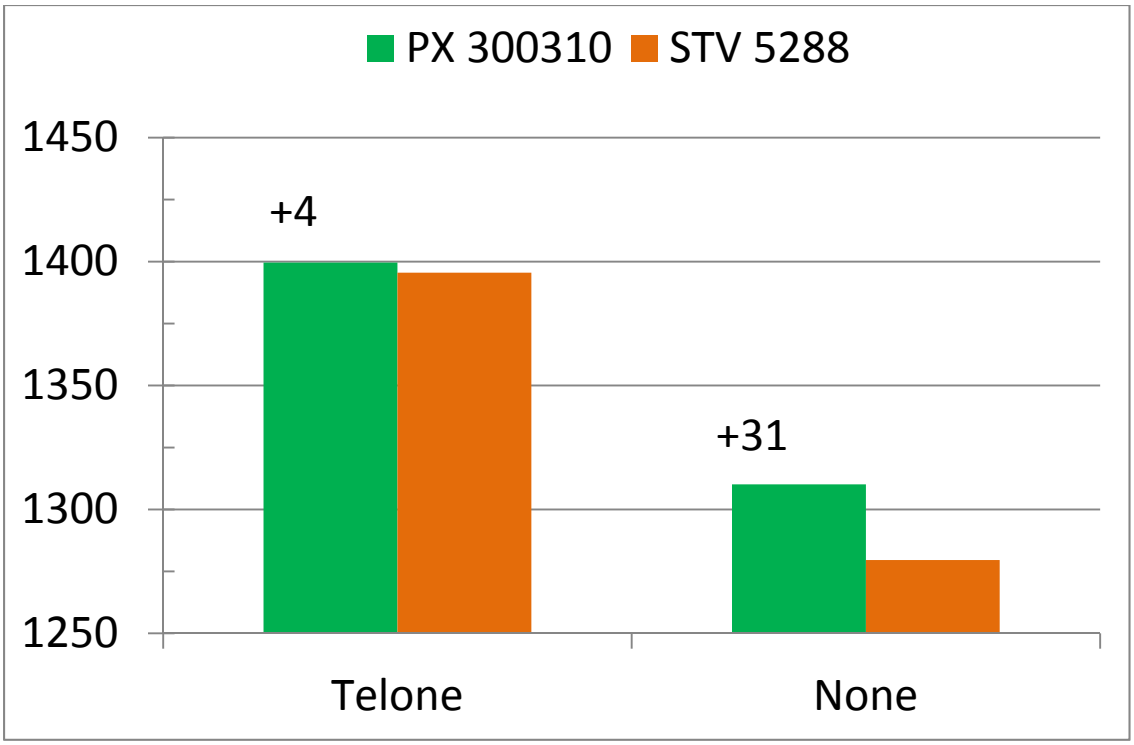

Figure 3. Lint yield results in lint pounds per acre for the cotton varieties at St. Joseph with and without Telone II.

Table 5. Cotton lint yields by treatment and soil type at Waterproof in 2014.

	Cotton Lint Yields							
	Soil types							
	WholeStrip		Bruin Silt Loam		Commerce Silt Loam		Tunica Clay	
Variety	Telone	None	Telone	None	Telone	None	Telone	None
	---------- lbs/acre ----------							
PHY 427	1472.3	1451.0	1380.4	1371.1	1553.5	1475.7	1499.7	1560.9
Stoneville 5288	1442.1	1340.6	1389.9	1250.9	1482.6	1346.5	1466.2	1497.1

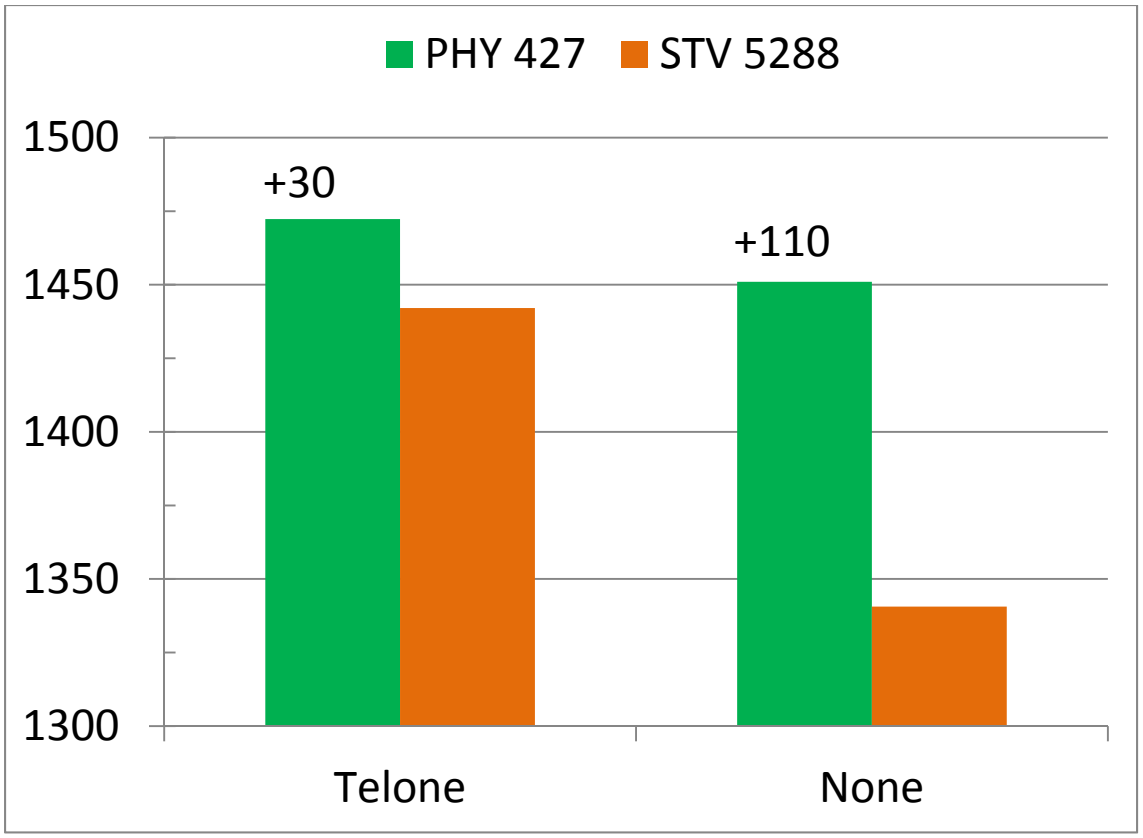

Figure 4. Lint yield results in lint pounds per acre for the cotton varieties at Waterproof with and without Telone II.

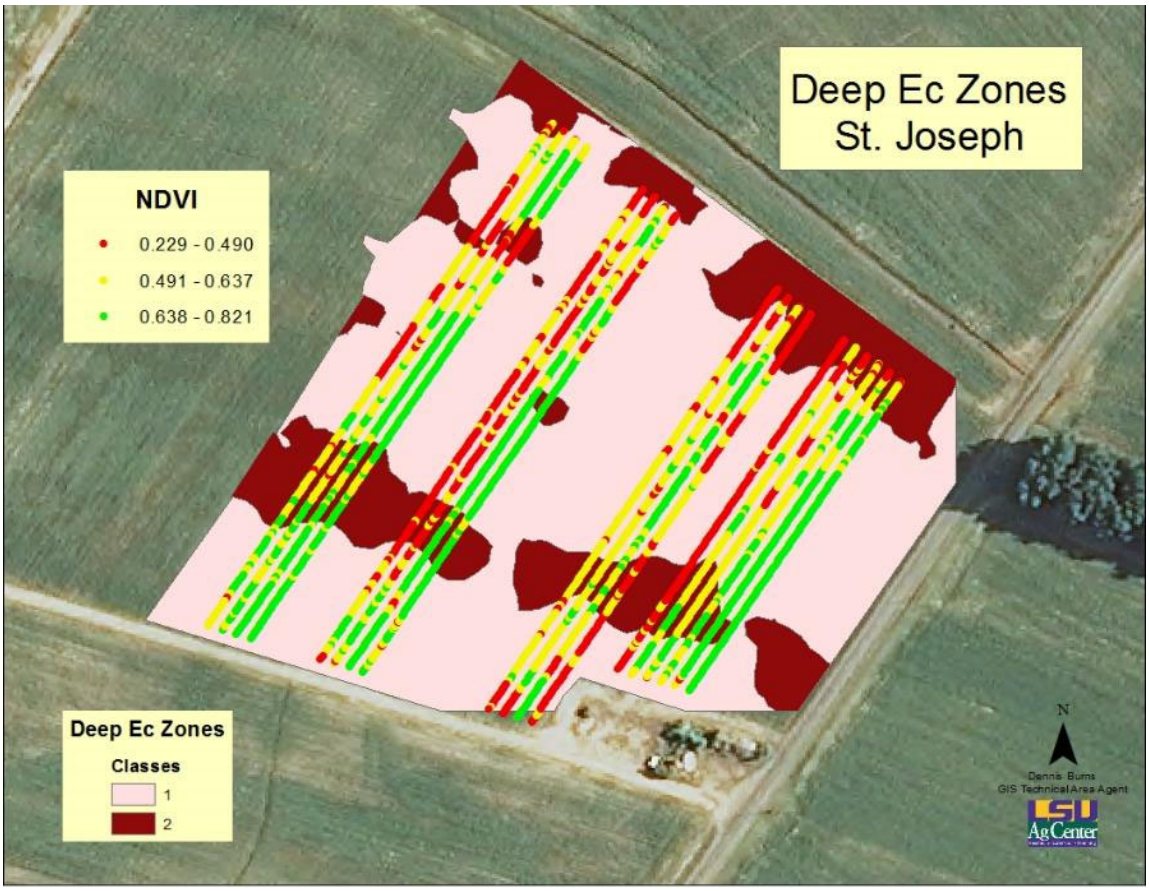

Figure 5. NDVI results taken at St. Joseph on July 1, 2014 overlaid on a Deep Ec map.

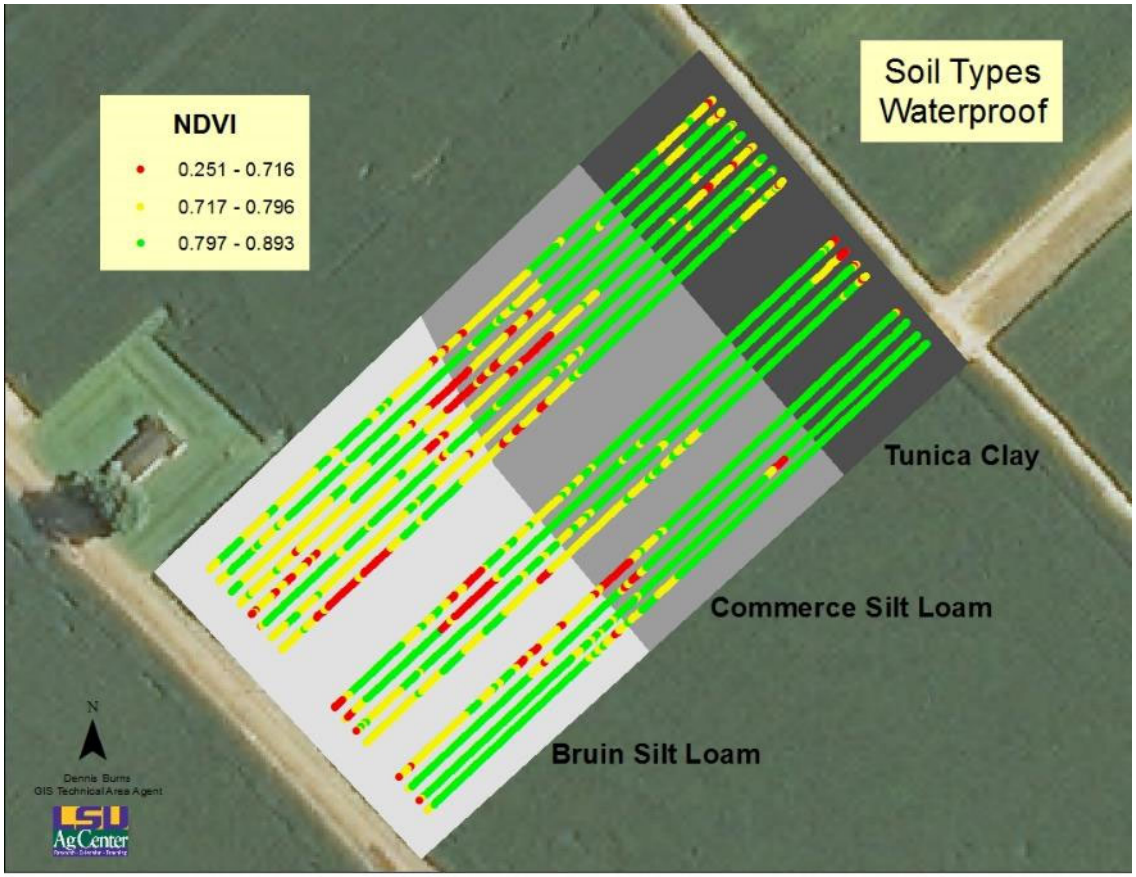

Figure 6. NDVI results taken at Waterproof on July 1, 2014 overlaid a soil map.

Summary

The average lint yield increase using Telone II was 112 pounds per acre with a standard variety in both locations. The average lint yield increase using Telone II in the Rook-Knot infested field was 21 pounds per acre for PHY 427WRF and 101 lbs for the standard variety. The application of Telone II is an effective method to control nematodes, especially when applied using precision application technology to maximize the return on investment. New nematode resistant cotton varieties will offer growers additional options to manage nematodes.