

## 2011 Syngenta Quilt Xcel™ Application on Corn Grown under Different Irrigation Stress Levels

### Progress Report

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#### Introduction

2011 was the first year of Quilt Xcel™ research at the North Plains Research Field Lab near Etter, TX, located approximately 10 miles north of Dumas, TX. Quilt Xcel is a fungicide from Syngenta with both preventive and curative properties in regards to disease. Applications of Quilt Xcel were made on four hybrids from Syngenta. One of these hybrids was from Syngenta's Agrisure Artesian™ line of first generation drought tolerant corn. The objective of this trial was to determine if applications of Quilt Xcel improved yield of corn grown under different irrigation levels in the High Plains of Texas.

#### Materials and Methods

The trial consisted of three commercial check hybrids and one Artesian hybrid (Table 1). These hybrids were planted at 32,000 seeds/acre under 3 irrigation levels with 6 replications. Individual plots were 4 rows 30-inch raised beds by 35 ft in length. Applications of Quilt Xcel were applied at

**Table 1. Hybrids and Maturity**

Hybrid	Relative Maturity
Check 1	105
Check 2	107
Artesian	109
Check 3	111

**Table 2. Irrigation Levels**

ET Level	Inches of Irrigation
100%	29.7
75%	23.0
50%	16.3

the V-5, R-1 or V-5+R-1 growth stages. An untreated check (UTC) was also included. Applications of Quilt Xcel were made at 10.5 fl oz/A in 10 gallons of water per acre. No adjuvant was used with any of the treatments. The V-5 application was made with a hand boom, and the R-1 application was applied with a backpack mounted boom to spray over the crop canopy. Both booms were set on 20 inch nozzle spacing and CO<sub>2</sub> was used as the propellant. Treatments were blocked across the length of the pivot by replication, in case of an equipment breakdown. Irrigation scheduling was determined by a water loss equation developed by Thomas Marek, Texas AgriLife Research Irrigation Engineer, which accounts for evapotranspiration (ET or water use), and calculates the amount of plant available water in the profile. Irrigation rates were set at 100% 75% and 50% ET. Total irrigation amounts can be found in Table 2. All plots were irrigated when soil

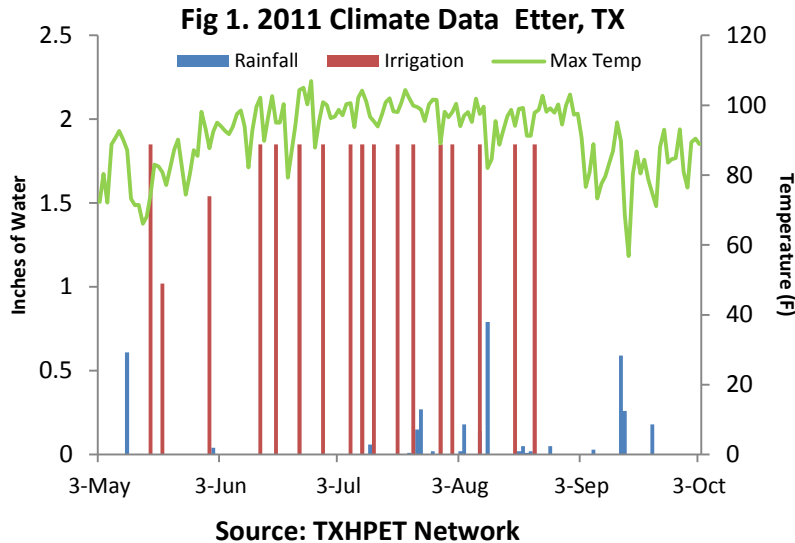
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water in the 100% ET treatment dropped to 50% plant available water. Irrigation amounts were varied across ET levels by using different output nozzles in different spans of the pivot. On the first two irrigation applications, all ET levels were watered at 100% irrigation to assure adequate germination and emergence. An unprecedented drought in the High Plains of Texas provided little effective rainfall to the crop (Fig 1). Only three rainfall events of over 0.5 inch were observed from



planting until harvest. In addition, temperatures were also above normal much of the growing season with 30 days of over 100°F. In each irrigation event in the 100% ET span, 1.86” was applied. This allowed for 0.93” to still be applied to the 50% ET to allow for better water infiltration and to minimize evaporative losses while keeping runoff at the 100% ET to a minimum. Commercial check 2 is excluded from any statistical analysis and

graphs, because of a significantly lower and erratic stand, possibly caused by consecutive days of high wind and very high heat.

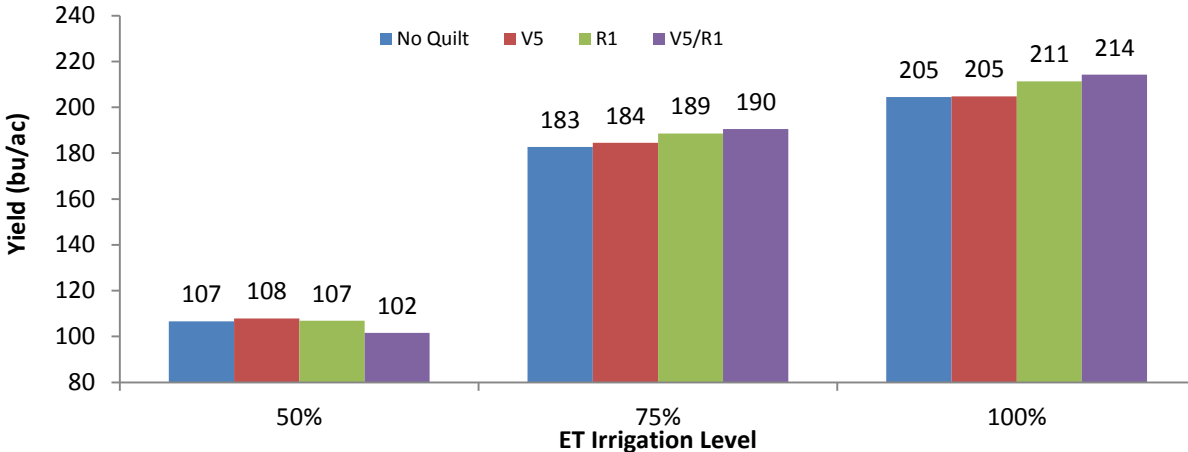
Other cultural practices and study information are listed below:

- Trial Location: Etter, TX approximately 10 miles north of Dumas, TX
- Previous Crop: Wheat
- Soil Type: Sherm Clay Loam, pH = 7.5
- Plot Size: Four, 30 inch bedded rows by 35 foot long
- Replications: 6
- Study Design: Randomized complete block
- Planting Date: May 3, 2011
- Planting Rate: 32,000
- Seed Method: John Deere Max-Emerge planter with Almaco seed cones
- Fertilizer: Applied 300 lb/acre N and 100 lb/acre P<sub>2</sub>O<sub>5</sub> preplant based on soil test results
- Herbicide: Bicep Lite immediately after planting. Status for bindweed control  
One aerial application of Oberon and Onager for spider mite control
- Irrigation: Center Pivot Irrigation. Amounts listed in Table 1
- Fungicide: Quilt Xcel at 10.5 oz/A  
Application at V5, R1, or V5+R1, Untreated Check also included

## Results and Discussion

No lodging or disease was observed in the trial. Although the differences were not significant ( $P=0.15$ ), when yields of the three hybrids were averaged together, the R1 and V5+R1 treatments

**Fig 2. Yield response to Quilt Xcel when averaged across hybrids at three irrigation levels ( $P=0.15$ )**

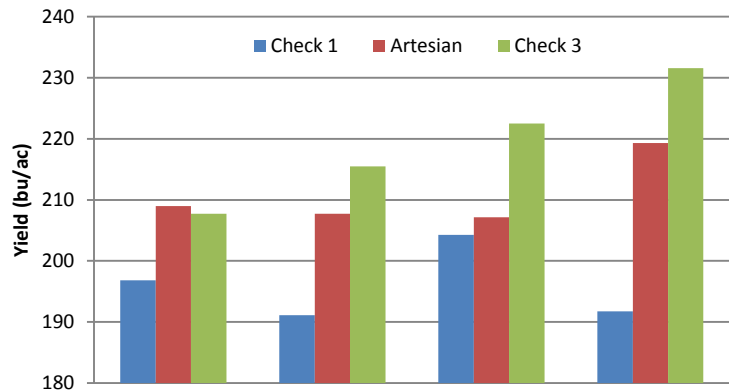


had numerically higher yields at both the 75% and 100% ET levels (Fig 2). There was no apparent Quilt Xcel effect on yield at the 50% ET level.

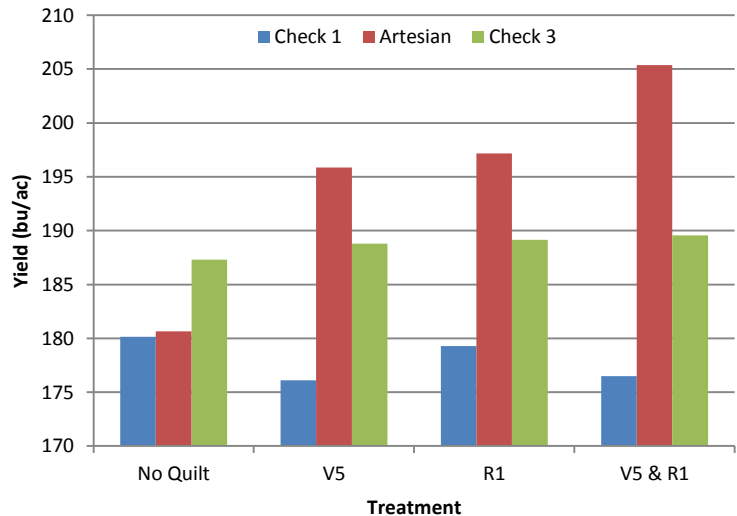
When yield response of the different hybrids to Quilt Xcel applications was examined by irrigation level, differences can be observed (Fig 3, 4 and 5). None of Quilt Xcel treatments had any effect on yield of Check 1 at any of the irrigation levels.

The Artesian hybrid did not respond significantly to Quilt Xcel treatment at the 100% ET but did have a positive yield response to all Quilt Xcel treatments at the 75% irrigation level. At this irrigation level, yield of the Artesian hybrid increased 15 bu/A when Quilt Xcel was applied at V5, 17 bu/A when applied at R1, and 25 bu/A when applied at both V5 and R1. At the 50% irrigation level there was a trend towards higher yields when Quilt Xcel was applied to the Artesian hybrid at V5 or R1, but

**Fig 3. 2011 100% ET Hybrid Response to Quilt Xcel**



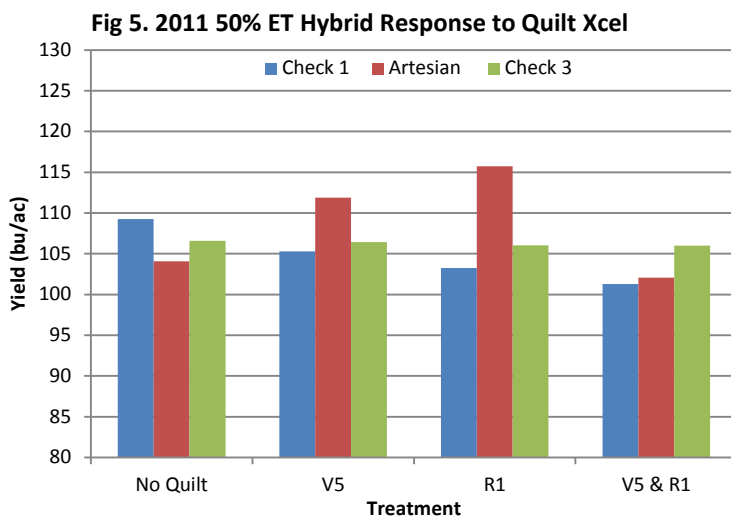
**Fig 4. 2011 75% ET Hybrid Response to Quilt Xcel**



surprisingly yield was decreased when an application was made at both V5 and R1.

The Check 3 hybrid only responded to Quilt Xcel application at the 100% ET irrigation level. Its yield increased 15 bu/A when treatment was applied at the R1 stage and 24 bu/A when applied at both the R1 and V5 stages, respectively, over the untreated (Fig 3). An 8 bu/A yield increase in Check 3 was observed over the untreated with the V5 alone application, but this was not a significant difference.

Yields from all treatments are reported in Table 4. Other comparisons not discussed here can be made by using information from Tables 3 and 4.



## Conclusions

- Yield response to Quilt was dependent on hybrid, irrigation level, and Quilt application timing
- The Artesian hybrid responded positively to applications of Quilt Xcel at 75% ET
- Check 3 responded positively to Quilt Xcel applications at 100% ET
- Check 1 showed no response to Quilt Xcel in all three irrigation levels
- In general, yield was more responsive to R1 or V5+R1 than the single V5 application
- **All conclusions made from this study should keep in mind that in 2011 the Texas High Plains experienced the highest temperatures and the most severe drought on record. Clearly these conditions impacted the results of this study. This trial will be repeated in 2012, hopefully under more normal climatic conditions.**

**Table 3. Factorial AOV for Grain Yield**

	Prob(F)	LSD
Replication	0.1855	4.57
Water Level	0.0001	3.23
Quilt	0.2298	3.73
Water X Quilt	0.1589	6.46
Hybrid	0.0001	3.73
Water X Hybrid	0.0001	6.46
Quilt X Hybrid	0.1491	7.46
Water X Quilt X Hybrid	0.0849	12.92

**Table 4. 2011 Syngenta Quilt Xcel Application on Corn Trial.**

		<b>Yield (bushels/acre)</b>				
		<b>Artesian</b>				
<b>ET Level</b>	<b>UTC</b>	<b>V5</b>	<b>R1</b>	<b>V5 &amp; R1</b>	<b>Mean</b>	
<b>100%</b>	209.0	207.7	207.1	219.3	203.4	
<b>75%</b>	180.7	195.9	197.2	205.4	178.8	
<b>50%</b>	104.1	111.9	115.7	97.4	104.6	
<b>Mean</b>	148.1	163.2	175.4	174.0	162.2	
		<b>Check 1</b>				
	<b>UTC</b>	<b>V5</b>	<b>R1</b>	<b>V5 &amp; R1</b>	<b>Mean</b>	
<b>100%</b>	196.8	191.1	204.3	191.8	197.2	
<b>75%</b>	180.2	168.8	179.3	176.5	168.3	
<b>50%</b>	109.3	105.3	98.8	101.3	98.0	
<b>Mean</b>	142.9	158.0	162.6	156.5	154.5	
		<b>Check 3</b>				
	<b>UTC</b>	<b>V5</b>	<b>R1</b>	<b>V5 &amp; R1</b>	<b>Mean</b>	
<b>100%</b>	207.7	215.5	222.5	231.6	224.5	
<b>75%</b>	187.3	188.8	189.1	189.6	186.0	
<b>50%</b>	106.6	106.4	106.0	106.0	104.4	
<b>Mean</b>	168.7	172.0	174.2	175.7	171.6	