

# Corn Hybrid Evaluations, Graham County, 1998

L.J. Clark and R. Walser

## Abstract

*Three studies were performed in two different geographical areas in Graham County in 1998. A Bt hybrid comparison and a non-Bt hybrid comparison were grown in the Bonita area and a mixed (Bt and non-Bt) study was grown in the Eden area. Results of these three field studies are reported in this paper. Pioneer 33A14 was the leading cultivar in the Bonita Bt study with a yield of 13426 pounds per acre. Pioneer 32J55 had the highest yield in the non-Bt study in Bonita with a yield of 14630 pounds per acre. Novartis N7639 produced the highest yield in the Eden study but with a yield considerably lower than those seen in the Bonita area.*

## Introduction

The studies in this report are a continuation of the varietal evaluations performed in the high desert areas of southeastern Arizona. The emphasis was to see the yield potential of the newer varieties that have emerged along with the advent of transgenic hybrids.

## Materials and Methods

Five Bt hybrids and nine non-Bt hybrids were grown on two separate pivots on the Haas Farm in Bonita, and fifteen Arizona. The plots were planted using the farmer's equipment and following his cultural practices. Factors affecting the crop are recorded below in the crop history:

### *Crop History - Bt trial on Haas Farm:*

Elevation: 4300 feet above sea level  
Soil type: Sonoita SL/Cowan SL/Tubac SL/Pima L/Guest CL complex  
Planting date: 16 April 1998                      Rate: 32,000 seeds per acre  
Fertilizer: 10 gal 10-30 +B+Mg+Zn, 250 lbs/ac 11-52, more N through pivot to bring the total to 275 pounds/acre  
Herbicide: Atrex  
Insecticide:  
Irrigation: Center pivot  
Plot size: 8 row plots approximately 2,500 feet long with check plots every 16 rows (rows were on 30 inch centers)  
Harvest date: 21 September

### *Crop History - Non- Bt trial on Haas Farm:*

Elevation: 4300 feet above sea level  
Soil type: Tubac SL/SCL/Pima L Sonoita SL complex  
Planting date: 21 April 1998                      Rate: 32,000 seeds per acre  
Fertilizer: 10 gal 10-30 +B+Mg+Zn, 250 lbs/ac 11-52, more N through pivot to bring the total to 275 pounds/acre  
Herbicide: Atrex  
Insecticide:  
Irrigation: Center pivot

Plot size: 8 row plots approximately 2,500 feet long with check plots every 16 rows (rows were on 30 inch centers)  
Harvest date: 21 September

*Crop History - Colvin Farm:*

Elevation: 2700 feet above sea level  
Soil type: Grabe clay loam  
Planting date: 24 April 1998 Rate: 34,000 seeds per acre  
Fertilizer: 200 lbs/ac N pre-plant, 40 lbs/ac in irrigation water  
Herbicide: 2,4-D early  
Insecticide: None  
Irrigation: Furrow irrigated 7x  
Plot size: 6 row plots approximately 845 feet long with check plots every 12 rows (rows were on 36 inch centers)  
Harvest date: 5 October

This was a strip plot trial with check plots every 16 rows on the Haas trials and every 12 rows on the Colvin trial. The check plots were used to evaluate the soil differences across the field. At Haas' plots were harvested and dumped into separate truck hoppers and sent to the elevator where weighing and sampling took place. At Colvin's plots were harvested and dumped into a weigh wagon where plot weights were determined and bushel weights and percent moisture were determined. Plant evaluations for stand, barren plants, ear height, lodging, smut, damage from ear worm and corn borer were made immediately before harvest. Yields were corrected to 15.5% moisture and recorded in pounds per acre.

## Results and Discussions

Table 1 contains yield and related data for the Bt corn hybrid study. Pioneer 33A14 had the highest yield at 13426 pounds per acre. This was the top yielding variety in the previous years test (1) Its percent moisture and bushel weight were better than the average for the study, even though not the best in the test. Its plant population was slightly lower than average for the study but not far from the optimal stand count. There is a small percentage of damage to ears and stalks in Pioneer 33A14 and to ears in Pioneer 34A14 from insect species that are generally controlled by the Bt gene. This may mean that gene expression was weak in these areas with these hybrids.

Table 2 contains yield and related data for the non-Bt corn hybrid study on the Haas farm. Yields were slightly higher than in the Bt study and this may relate to the fact that the previous crop was beans in this study compared with corn following corn in the Bt study. Pioneer 32J55 produced the highest yield in this study as well as in the corn variety evaluation in Yuma in 1998 (2). More than half of the tested hybrids yielded higher than the old standard, Pioneer 3162. This indicates that the old standard will soon be pushed into obsolescence. The percent moisture column shows data that closely follows the maturity listed by Pioneer seed company. The 33 series are quicker maturing than the 31 series. The percent ear worm damage indicates the percentage of the ears that had significant damage, not the percent of damage on a given ear.

Table 3 contains the yield data for the Colvin study in Eden. Several parts of the field were overgrown by morningglory to the point that the combine could not harvest the plots. The harvest was delayed later that optimal to allow the morningglory vines to dry and in the process the corn dried below its optimal harvest level. This reduced the yield due to field losses and cracking. It is interesting to note that the Novartis varieties performed the best under the conditions of the trial and Pioneer 33A14 that performed so well in the Bonita trial came in with the lowest yield. Yields better than those seen in this trial can be achieved in the Safford valley, but with current conditions and cultural practices, it is impractical to try to achieve yields like those seen in the Bonita area.

## References

1. Clark, L.J. 1998. Corn hybrid evaluations, Bonita, 1997. Forage and Grain, A College of Agriculture Report, The University of Arizona, Tucson, AZ. Series P-114, 121-123.

2. Tickes, B. 1998. Corn variety evaluation, Yuma, AZ - 1998. Memorandum of research results, Yuma County Cooperative Extension, September 11, 1998.

**Table 1. Yields and related data for Bt corn hybrid evaluation on the Haas Farm, 1998.**

Variety	Yield @ 15.5% M (lbs/ac)	Adjusted Yield 15.5% M	% M	Bu Wt	Pl/ac	Ear Ht	% Barren	% Ear Worm Damage	% Corn Borer Damage
Pio 33A14	13426.0	13426.0	18.7	57.4	30492	46.5	0	6.0	2.5
Pio 31B13	12308.6	12514.7	20.2	57.4	26136	55.0	-8.3	0.0	0
Pio 34T14	12511.3	12409.1	17.8	59.2	32670	51.0	0	10.0	0
N-7639BT	11885.9	11962.3	20.2	57.4	32670	43.0	0	0.0	0
DK 591	11559.0	11392.4	18.9	54.9	37026	46.0	0	0.0	0
Average	12338.16	12340.9	19.16	57.26	31798.8	48.3	-1.66	3.2	0.5
2X StdDev	--	458	0.58	1.34	3080.2	2.24	0.0	--	--

**Table 2. Yields and related data for non-Bt corn hybrid evaluation on the Haas Farm, 1998.**

Variety	Yield @ 15.5% M (lbs/ac)	Adjusted Yield 15.5% M	% M	Bu Wt	Plants per acre	Ear Ht	% Barren	% Smut	% Ldg	% Ear Worm	% Corn Borer
32J55	14630.3	14654.8	20.3	58.7	34848	44.0	0.0	0.0	0.0	40	0
32P75	14332.8	14492.1	19.3	57.0	28314	47.0	0.0	0.0	0.0	10	30
33H67	14502.9	14483.7	18.5	59.1	30492	48.0	0.0	0.0	0.0	20	0
32J49	14364.7	14344.9	20.1	27.8	32670	52.0	0.0	0.0	0.0	20	0
31A12	14357.3	14330.5	22.8	57.2	28314	51.0	0.0	0.0	0.0	20	0
3162	14058.3	14089.5	21.3	26.4	34848	46.0	0.0	0.0	0.0	30	10
X1147X	14100.4	13972.0	19.2	54.4	28314	54.0	0.0	0.0	0.0	20	0
<b>33R87</b>	<b>13663.1</b>	<b>13663.1</b>	<b>17.6</b>	<b>58.2</b>	<b>31309</b>	<b>47.3</b>	<b>4.3</b>	<b>0.0</b>	<b>0.0</b>	<b>19</b>	<b>10</b>
32R90	12189.4	12176.1	21.6	57.1	30492	60.0	7.1	7.1	0.0	30	10
X1187A	11907.5	11799.1	23.3	56.0	32670	50.0	0.0	0.0	0.0	20	10
Average	13810.7	13800.6	20.4	57.2	31227	49.9	1.1	0.7	0.0	22.88	7.0
2X Std Dev.	--	144.8	0.6	2.4	1201	2.6	7.0	0.0	0.0	25.4	17.4

**Table 3. Yield data for corn hybrid evaluations on the Colvin Farm, 1998.**

Variety	Yield @ 15.5% Moisture (lbs/ac)	Adjusted Yield @15.5% M	Percent Moisture	Bushel Weight
Novartis N 7639	6547.0	7720.8	12.0	63.0
Novartis N 7590Bt	6921.2	7653.6	9.7	57.0
Pioneer 31B13	7350.4	7573.7	9.2	59.5
Cargill 8021	6662.7	6817.1	10.6	59.0
Cargill 7821	7216.4	6662.9	10.5	60.0
Pioneer 33H67	6326.5	5777.7	8.4	61.0
DeKalb 591 (Bt)	5778.9	5617.1	9.6	56.5
Pioneer 32P75	5982.2	5484.3	9.6	57.5
<b>Pioneer 33R87</b>	<b>5443.7</b>	<b>5443.7</b>	<b>10.0</b>	<b>59.4</b>
Novartis 83-NK	4799.6	5020.9	11.8	61.5
Pioneer 3162	5504.4	4933.3	10.1	59.0
Novartis N 7070Bt	4455.5	4667.9	11.6	57.0
Pioneer 34T14	3922.5	4300.1	11.0	59.5
Pioneer 33Y09	3862.3	3583.8	9.6	57.5
Pioneer 33A14	3281.2	3202.9	10.4	58.0
<b>Average</b>	<b>5536.3</b>	<b>5481.4</b>	<b>10.2</b>	<b>58.7</b>

1. Yields were adjusted for field variation using the check plots.