# Corn Hybrid Evaluations, Bonita, 1997

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## *Abstract*

*Results of two field studies are reported in this paper. One study had six Bt corn hybrids and a non-Bt check, the other had six non-Bt hybrids (including 3 experimentals) and a non-Bt check. Pioneer 33A14 was the highest yielding hybrid in the Bt study with a yield of 14548 pounds per acre. Its yield was 1000 pounds per acre higher than the next Bt hybrid and nearly 2000 pounds per acre higher than Pioneer 3162, the non-Bt check. In the non-Bt study, a Pioneer experimental yielded 15405 pounds per acre, nearly 2000 pounds per acre higher than the next highest hybrid.*


## Introduction

Several years have passed since the last University corn study was planted in the high deserts of southeast Arizona. This study was important because transgenic technology has brought Bt hybrids into the marketplace and they need to be evaluated against each other and against Pioneer 3162 which has been the strongest yielding hybrid over the past several years.

## Materials and Methods

Six Bt hybrids and six non-Bt hybrids were compared against Pioneer 3162 on two separate pivots on the Haas Farm in Bonita, 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:*

Elevation: 4300 feet above sea level
Soil type: Tubac sandy loam
Planting date: 18 April 1997 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 250 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: 9-26-97

This was a strip plot trial with check plots every 16 rows. The check plots were used to evaluate the soil differences across the field. Plots were harvested and dumped into separate truck hoppers and sent to the elevator where weighing and sampling took place. 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 14548 pounds per acre. 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. All of the Bt hybrids but one yielded higher than Pioneer 3162, the old time standard. This bodes well for the new technology.

Table 2 contains other agronomic information for this same study. The leading hybrid, Pioneer 33A14 had good numbers on everything but the percent ear worm damage. This high number would indicate that the Bt gene was not expressed well in the ears. The zero percent damage by corn borers indicates that the Bt expression was strong in the stalk. The Northrup King hybrid N-7639BT, apparently had some Bt expression failure in the stalk as 20% of the stalks had corn borers present.

Table 3 contains the yield data for the non-Bt study. The exciting part is the high yield of one Pioneer experimental. Its yield was nearly 2000 pounds per acre higher than the next hybrid and also higher than Pioneer 33A14 the highest yielding Bt variety.

Things look optimistic for the development of a new set of corn hybrids with higher yield potential than those of the past. Our studies will continue to follow these developments.

**Table 1. Yields and related data for Bt corn hybrid evaluation on the Haas Farm, 1997.**

| Variety | Yield @ 15.5% M | % Moisture | Bushel Weight | Plants/acre |
|---|---|---|---|---|
| Pio 33A14 | 14547.8 | 18.3 | 58.4 | 30492 |
| Pio 31B13 | 13523.4 | 19.7 | 57.3 | 37026 |
| Pio 31V08 | 13247.2 | 17.2 | 59.0 | 32670 |
| N-7590BT | 12793.4 | 21.0 | 54.3 | 37026 |
| Pio 33Y09 | 12699.4 | 17.5 | 58.8 | 26136 |
| Pio 3162 | 12657.2 | 22.9 | 55.9 | 29040 |
| N-7639BT | 12615.7 | 21.7 | 55.4 | 34848 |
| Average | 13154.9 | 19.8 | 57.0 | 32462.6 |

**Table 2. Agronomic values observed in Bt corn hybrids evaluations, Haas Farm, 1997.**

| Variety | % Barren | % Smut | % Lodging | % Ear Worm | % Corn Borer | Ear Height |
|---|---|---|---|---|---|---|
| Pio 33A14 | 0.0 | 0.0 | 0.0 | 21.4 | 0.0 | 56.5 |
| Pio 31B13 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 70.0 |
| Pio 31V08 | -13.3 | 0.0 | 6.7 | 0.0 | 0.0 | 50.5 |
| N-7590BT | 0.0 | 0.0 | 0.0 | 5.9 | 0.0 | 47.0 |
| Pio 33Y09 | 0.0 | 0.0 | 0.0 | 8.3 | 0.0 | 57.0 |
| Pio 3162 | 0.0 | 0.0 | 0.0 | 14.8 | 46.7 | 51.0 |
| N-7639BT | 6.3 | 0.0 | 0.0 | 6.3 | 20.0 | 51.5 |
| Average | -1.0 | 0.0 | 1.0 | 8.1 | 9.5 | 54.8 |

**Table 3. Yield data for non-Bt corn hybrid evaluations, Haas Farm, 1997.**

| Variety | Yield @ 15.5% Moisture | Percent Moisture | Bushel Weight |
|---|---|---|---|
| Exptl #2 | 15404.8 | 17.6 | 61.1 |
| Pio 33R87 | 13554.0 | 16.2 | 61.4 |
| Pio 3225 | 13068.4 | 19.3 | 59.1 |
| Exptl #3 | 13026.8 | 20.2 | 57.9 |
| Exptl #5 | 12324.7 | 18.0 | 58.6 |
| Pio 3341 | 10049.8 | 16.6 | 61.1 |
| Pio 3162 | 9083.3 | 20.0 | 57.3 |
| Average | 12358.8 | 18.3 | 59.5 |