

Evaluation of Golden Harvest Corn Hybrids for Blunt Ear Syndrome

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Summary: These data reinforce the importance of field testing corn hybrids for susceptibility to blunt ear syndrome (BES). When corn hybrids are determined to be susceptible to BES marketing of these hybrids can be more accurately directed to minimize the possibility of growing susceptible hybrids in areas where there is a significant potential for BES and associated yield losses. As with other agronomic studies, evaluating corn hybrids over several years will provide a more complete picture of hybrid response to BES.

Background: Blunt ear syndrome, also called "beer-can ears, hand-grenade ears, and stunted ears," is a malady of corn that is characterized by normal-appearing corn plants having reduced ear lengths and fewer kernels per row. A portion of the ear tip is barren in an otherwise normal-looking husk. Yield losses from BES have ranged from minor amounts to as much as 70%. Previous research has shown that some corn hybrids are more susceptible to BES than others. Identifying corn hybrids that are susceptible to BES allows seed companies to more accurately market their hybrids. Occurrence of BES is sporadic, making it difficult to establish ongoing BES evaluation trials. The occurrence of BES from year to year in the Grand Valley of western Colorado has been more consistent than any other place in the country, making it the best location in the U.S. to evaluate corn hybrids for BES.

Method: Twelve Golden Harvest brand corn hybrids were evaluated for BES at the Colorado State University Fruita Research Center in 1998. The experiment was a randomized complete block with four replications. Plot size was 5 feet wide and 50 feet long. The previous crop was corn and the soil type was a Glenton very fine sandy loam. The seedbed was prepared using clean tillage. Harness was applied preplant incorporated at 1.75 pts/acre on April 30, 1998. Planting occurred on May 6, 1998 with a white air planter that had been modified for planting small plots.

Fertilizer applications were 22 lbs N/acre plus 104 lbs P₂O₅/acre applied preplant on April 30, 1998 and 160 lbs N/acre as urea ammonium nitrate (32-0-0) as a side-dress application on June 10, 1998. Comite II at 2.25 pts/acre and Dimethoate at 1 pt/acre were applied on July 20, 1998.

Both corn rows of each plot were counted the entire length of the plot on June 10, 1998 to determine plant populations.

Harvest occurred on November 18, 1998 using a small plot combine. Just prior to harvest, plots were rated for BES using our standard rating scale (Table 1). Grain moisture and test weights were determined with a Seedbuco GMA128 moisture analyzer and grain yields were corrected to 15.5% moisture.

Results: The 1998 growing season was favorable for corn production in western Colorado. Weed control in the field was excellent. The only problem encountered during the growing

season was deer trafficking through the plots, mainly in the alleyways, at the end of the growing season. Damage caused from the deer did not appear to affect the results of the study.

Grain moisture was significantly different among the corn hybrids (Table 2). Grain moistures for the hybrids averaged 16.2% and ranged from a high of 20.0% for H-2643 to a low of 14.5 for H-2265.

Grain yields also differed significantly among the hybrids (Table 2). H-2547 and EX-557 had the highest grain yields at 11,968 lbs/acre (214 bu/acre) and 10,805 lbs/acre (193 bu/acre), respectively, while H-2315, H-2643, and H-2309 had low yields of 6,420 lbs/acre (115 bu/acre), 5,213 lbs/acre (93 bu/acre), and 4,835 lbs/acre (86 bu/acre), respectively.

Plant populations was significantly different among corn hybrids (Table 2). H-2309 had a low plant population and was likely a result of poor quality seed. The low plant population of H-2309 was certainly a major contributing factor to the low grain yield. The planter was set to plant 35,890 seeds/acre. If small corn seed is used in this planter the plate cells can carry more than one seed, resulting in seeding rates that are higher than the intended seeding rate. This was apparently the situation that occurred for H-2493, H-2265, and H-2581.

Test weights for all 12 hybrids were greater than 56.0 lbs/bushel (Table 2). Average test weight was 58.7 lbs/bushel and ranged from a high of 60.5 for H-2382 to a low of 56.4 for H-2643.

H-2643 experienced severe lodging (Table 2). Lodging for other hybrids was less than 8%. Some of the plants that lodged may have been caused by the deer traffic.

Blunt ear syndrome in 1998 at the Fruita Research Center was not as severe as in 1997. Nevertheless, BES rating scores among corn hybrids were statistically different (Table 2). Hybrids with comparatively low scores, 7.0 to 6.5, (more BES) were H-2643, H-2547, EX-557, and H-2581. The highest ratings recorded in this study were 7.5. Hybrids with scores of 7.5 were H-2478, H-2315, and H-2377.

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Table 1. Rating scale for evaluating Blunt ear syndrome of corn.

- 9 - No visible symptoms - normal ear, cob extends the expected full length.
- 8 - Near normal ear with an abnormal tip.
- 7 - Between 8 and 6.
- 6 - Cob at 3/4 of a normal ear with abnormal tip.
- 5 - Between 6 and 4.
- 4 - Cob at 1/2 of a normal ear with abnormal tip.
- 3 - Between 4 and 2.
- 2 - Cob shorter than 1/4 of a normal ear with abnormal tip.
- 1 - Essentially little or no cob within the husk

Table 2. Evaluation of 12 Golden Harvest hybrids for Blunt Ear Syndrome at Fruita, Colorado 1998.

Hybrid	Grain Moisture (%)	Grain Yield		Plant Population(no.)	Test Weight (lbs/bu)	Lodging (%)	BES score ¹
		lbs/acre	bushel/acre				
H-2265	14.5	7374	132	37,389	60.1	2.9	7.4
H-2315	15.2	6420	115	31,581	60.3	7.8	7.5
H-2309	15.1	4835	86	16,063	59.5	7.5	7.1
H-2377	15.1	8838	158	34,576	58.9	4.1	7.5
H-2382	15.1	7136	127	35,211	60.5	6.7	7.2
H-2398	15.8	8839	158	28,541	58.6	4.4	7.1
H-2478	15.8	8729	156	31,173	57.4	3.0	7.5
H-2493	15.7	8990	161	37,616	57.6	3.9	7.1
EX-557	16.1	10805	193	34,122	59.2	0.7	6.8
H-2547	17.6	11968	214	34,576	58.7	3.0	7.0
H-2581	18.3	9776	175	36,119	56.8	7.1	6.5
H-2643	20.0	5213	93	30,084	56.4	43.7	7.0
Ave.	16.2	8244	147	32,254	58.7	7.9	7.1
CV (%)	4.0	15.4	15.4	6.7	1.1	64.4	2.5
LSD (0.05)	0.9	1822	33	3118	0.9	7.3	0.2

¹ See Table 1 for an explanation of the rating scale.