

## 2012 State Silage Corn Performance Test on the Texas High Plains

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### Introduction

The significant dairy and beef industries in the Texas High Plains require large amount of grain and silage corn. Selection of a hybrid with high tonnage potential and acceptable quality is a key decision that a producer continually faces. We initiated the state silage corn performance test at the Texas A&M AgriLife North Plains Research Field at Etter in 2007, and at the Texas A&M AgriLife Research Station at Halfway in 2008 (Xu et al, 2007; 2009). Since then, we have conducted the tests at both locations annually. The interest among producers and seed industry regarding this program's data remains strong. Almost all seed companies that offer corn hybrids in this region have participated in the tests, and the number of hybrids entered annually continues to grow. Commercial seed companies have an opportunity to enter hybrids at either or both test sites, which is fee-based. To our knowledge, this is the only public comparative field testing program available in the Texas High Plains. The goal is to provide producers with timely and unbiased performance information regarding yield, quality, and agronomic traits.

### Entries of 2012 State Silage Corn Performance Test at Etter and Halfway:

The 2012 State Silage Corn Performance Test included 35 hybrids at Etter and 33 at Halfway submitted by seven companies (Tables 1 and 3). Thirty-one hybrids were common in both locations. In addition, 15 experimental hybrids from the Texas A&M AgriLife Corn Breeding Program in Lubbock were included at each location. These are the testcrosses of the brown midrib (BMR) inbred lines (carrying *bm1* gene) with a licensed proprietary non-BMR stiff-stalk tester. Four hybrids from Blue River Hybrids had no transgenic traits. The hybrids without transgenic traits are suitable for organic corn production. F2F626, F2F714, and the Texas A&M EX2012A have the BMR trait. Entry 50 at Etter is a brown midrib (*bm3*) hybrid where both parent lines were developed by the Texas A&M AgriLife Corn Breeding Program in Lubbock. Relative maturity is reported as per the seed companies and mostly ranges from 109-118 days.

### Experimental Designs:

The test was conducted under a center pivot field at the Texas A&M AgriLife North Plains Research Field at Etter and at the Texas A&M AgriLife Research Station at Halfway. The tests used a randomized complete block design with three replications. Each plot consisted of four rows, 17.5 feet long with 2.5-foot alleys. Row-spacing was 30-inches at Etter and 40 inches at Halfway. The two center rows of each plot were harvested for yield.

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### **Agronomic Practices at Etter:**

The test was planted on May 7 and harvested on September 7, 2012. The previous crop was wheat, followed by summer fallow. Pre-plant fertilizers were applied at the rate of 149.1 (N) lbs/a and 133 (P) lbs/a with a strip till rig on April 20. An additional 140 lbs. of nitrogen was applied through the pivot on June 20 and 26, and July 5, 11, 14, 23, and 30. A herbicide mixture of Bicep Lite II Magnum at 1.25 qt/a, Balance Flex at 3 oz/a, Medal II at 0.8 pt/a, and Mad Dog Plus at 1.5 pt/a was applied on April 5 to control weeds before planting. After planting, Mad Dog Plus at 40 oz/a and Sharpen at 2 oz/a were applied on May 14. On June 18, Option at 1.5 oz/a and Status at 8 oz/a were applied to control Johnson grass and other grassy weeds. Lorsban 15G was applied at 6.5 lbs/a through the planter units to control corn rootworm. At the three-leaf stage, seedlings were hand-thinned to a uniform target population of 33,852 plants/a. Strip till management was implemented without the listing of seedbeds. The test site had an adequate soil moisture profile level at planting. Monthly rainfall during the growing season was as follows: May – 0.0, June – 2.12, July 0.24, and August 1.45. Total rainfall from planting to harvest (May to August) was 4.41". The field was irrigated regularly at the 100% ET level through a center-pivot irrigation system fitted with LESA nozzles at 60" spacing. A total of 25.66 inches of water was applied during the season. During the growing season, plants were only slightly injured from a hail storm that occurred on June 14<sup>th</sup>. The plots within this field appeared very uniform.

### **Agronomic Practices at Halfway:**

The test was planted on April 25 and harvested on September 4, 2012. The previous crop was cotton. Granular urea and mono-ammonium phosphate were broadcast on March 13 at the rate of 150 lbs. N/a and 30 lbs. P/a. Fertilizers were immediately incorporated into the soil by using an offset disk. Seedbeds were listed on January 9. Herbicides Aatrex at 1 qt/a and Roundup at 32 oz/a were applied on April 26 and activated by watering the field with the pivot. At three-leaf stage, seedlings were hand-thinned to achieve a uniform target population of 30,618 plants/a. On June 11, the herbicide Warrant was applied at 3 pt/a, and the liquid fertilizers were side dressed at 100 lbs, N/a. A total of 3.1 inches of water was applied between April 6 and April 24 prior to planting. From planting to harvest, a total of 21.34 inches of water was applied at regular intervals. In-season rainfall totaled 8.14 inches. With the high temperature and wind, the amount of irrigation water did not meet the plant evapotranspiration demand at 100% level.

### **Data collected:**

Data was recorded for stand, flowering dates, plant and ear height, and root and stalk lodging. Stand is reported as a percentage of the target plant population. There was no root or stalk lodging in any plots at harvest in either location. The two-center rows of each plot were harvested with a John Deere 5200 small-plot silage chopper equipped with a Hagie silage plot weighing system. The plots were harvested on September 4 at Halfway, and September 7 at Etter. A mechanical problem with the silage chopper delayed harvesting 5-10 days later than the target date (average milk line at 50%), especially at Halfway where irrigation was withheld in preparation for harvesting. Plants were cut 5 inches above the ground. Approximately 2 lbs of a chopped sub-sample were collected from each plot, weighed for the fresh weight, dried at 50°C, weighed for dry weight, and then analyzed for silage quality using NIR methods by the Dairy One Forage Lab (Ithaca, NY). The moisture content was calculated by using fresh and dry weight of the sub-samples. Yields were measured on a plot basis, converted to short tons per acre, and adjusted to a 65% moisture level.

### **Test Results at Etter Location:**

The mean yield of all 50 hybrids was 33.5 tons/a, ranging from 27.3 to 39.7 tons/a (Table 1). Three hybrids yielded significantly more than the average entry: BH Genetics XP8977RR/HX (39.7 tons/a), Golden Acre GAX6156RR (39.0 tons/a), and Mycogen TMF2L825 (37.3 tons/a). The average silage yield of the State Silage Corn State at Etter increased about 10% from 2007 to 2012. Stands averaged 95.5% overall and most hybrids had excellent stands. There was no noticeable root and stalk lodging at harvest. Days from planting to pollen shed averaged 66.3. Whole plant moisture at harvest averaged 59.6% and ranged from 53.0% to 71.6%. Due to mechanical problems with our silage chopper, harvesting at this location was delayed about 5 days from the targeted harvesting date. In preparation for harvesting, irrigation was suspended before the target harvest date. Consequently, the plants dried down quickly under the high daily temperatures. Plants of the top five yielding hybrids were all above 10 feet tall (Table 1). The C.V. values of 6.7% for forage yield and 4.4% for forage moisture indicate that this was a very uniform test; the field was well managed; plant population was uniform; and that fertilizer and water were adequate. Silage quality was analyzed with NIR and all analyzed quality traits were highly different among the entries (Table 2). Users should consider different quality traits, but TDN and IVTN24 are commonly used to represent forage digestibility. In this test, TDN values ranged from 65.0% to 79% with an average of 71.8%, IVTD24 values ranged from 69.0% to 83.5%. A high value of TDN and IVTD24 indicates a higher digestibility. Digestibility of corn silage is also highly correlated to the amount of grain produced and also the chemical composition of the stalk.

### **Test Results at Halfway Location:**

The average forage yields of the 50 hybrids tested at the Halfway was 27.8 tons/a, ranging from 20.5 tons/a to 36.2 ton s/ac (Table 3). Only one hybrid (Entry 48, 36.2 tons/a) had a yield significantly higher than the test mean. The yield at Halfway was much lower than the Etter location, probably due to the following three factors: less irrigation water applied due to limited well capacity, a wider row spacing (40 inches vs. 30 inches) and higher daily temperatures. All hybrids had good plant stands, equal to or close to the target population of 31,954 plants per acre. The maturity of the hybrids was different. The days from planting to pollen shed ranged from 64 to 74 with an average of 73. The whole plant moisture at harvest averaged 46.6%, which was much lower than the target level of 65%. As indicated in the previous section, mechanical problems with the silage chopper delayed the harvesting of this test about one week. The genetic difference in silage quality traits at this location was insignificant except for CP and lignin (Table 4).

### **Summary**

Hybrid selection is an important decision for silage corn producers. A good silage hybrid should have a strong adaptation to local environment, appropriate maturity, high tonnage and digestibility, and stable production performance across varying environments. New silage hybrids have been introduced in the Texas High Plains since we started this test at Etter in 2007. The average silage yield of all entries at Etter has increased about 10% over the last six years. The averaged tonnage per acre was 29.98 in 2007, 29.32 in 2008, 32.58 in 2009, 31.3 in 2010, 32.96 in 2011, and 33.5 in 2012. Considering the similar crop management practices at this location, the yield increase is possibly due to improved genetics entered into this test. All silage corn in the High Plains is virtually produced with irrigation water derived from the Ogallala

Aquifer. More tonnage per acre is a good indicator of genetic improvement of crop water use efficiency and better genetics adapted to this environment.

These results are available at the State Crop Performance Test Program (<http://varietytesting.tamu.edu>) and the Texas A&M AgriLife Research Lubbock Center websites (<http://lubbock.tamu.edu>). These results will help producers, Extension specialists and consultants select commercial hybrids best suited in the Texas High Plains.

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Table 1. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Etter, Texas in 2012.

ENO	Hybrid	Company	RM	Traits	Days to						
					Stand %	pollen shed	Plant ht, in.	Ear ht, in.	Moist, %	Yield, tons/a	Yield rank
1	1262 PRO2	Armor Seed	112	VT2 PRO	98.5	62.0	125.6	37.4	54.3	31.8	41
2	1415 PRO3	Armor Seed	114	VT3 PRO	95.5	63.0	110.8	33.1	55.6	32.3	38
3	1330 PRO3	Armor Seed	114	VT3 PRO	101.0	63.0	124.8	36.4	57.0	33.1	29
4	1550 PRO3	Armor Seed	115	VT3 PRO	99.9	63.0	110.2	37.0	55.2	34.5	15
5	1770 PRO3	Armor Seed	117	VT3 PRO	99.0	63.0	107.6	37.1	61.7	34.5	17
6	1850PRO3	Armor Seed	118	VT3 PRO	99.0	66.0	119.6	42.3	54.5	34.7	14
7	XP8910RR	B-H Genetics	118	RR2	76.2	68.0	127.7	49.0	61.1	31.7	42
8	XP8977RR/HX	B-H Genetics	117	RR2/HX/LL	100.0	65.0	123.5	46.3	57.7	39.7	1
9	BH9018VTTP	B-H Genetics	118	GENVT3PRO	99.0	67.0	120.3	46.9	55.4	34.4	18
10	X12011GTR	B-H Genetics	117	GT	96.1	65.0	118.6	45.9	54.2	33.1	28
11	BH8933VT3	B-H Genetics	117	VT3 PRO	97.0	68.0	126.5	49.5	60.5	34.7	13
12	X11152VTTP	B-H Genetics	117	GENVT3PRO	98.5	65.0	114.4	40.7	58.3	33.6	23
13	BH8895VTTP	B-H Genetics	116	GENVT3PRO	100.0	66.0	121.3	45.8	57.8	33.1	27
14	BH8719RR/HXT	B-H Genetics	117	RR2/HX/LL/RW	90.5	65.0	121.9	49.3	59.2	31.3	45
15	BH9029VTTP	B-H Genetics	118	GENVT3PRO	99.5	64.0	121.1	43.4	58.2	34.5	16
16	X12107GT3	B-H Genetics	118	GT/CB/LL/RW	94.1	64.0	125.3	44.1	59.0	33.4	24
17	CX12117	CPS/DynaGro	115	VT3P	99.0	65.0	120.7	47.8	58.9	36.4	5
18	D56VP24	CPS/DynaGro	116	VT3P	80.7	66.0	117.1	44.9	59.0	32.2	39
19	D57VP51	CPS/DynaGro	117	VT3P	98.0	65.0	108.1	34.8	53.0	35.7	8
20	D58VP30	CPS/DynaGro	118	VT3P	99.0	64.0	126.8	48.0	55.6	35.0	11

Table 1. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Etter, Texas in 2012 (continued).

ENO	Hybrid	Company	RM	Traits	Days to		Plant ht, in.	Ear ht, in	Moist, %	Yield, tons/a	Yield rank
					Stand %	pollen shed					
21	GAG8551	Golden Acres Genetics	118	VT3 PRO	78.5	69.0	129.4	45.4	61.4	32.6	34
22	GAX6156RR	Golden Acres Genetics	118	RR	97.4	67.0	124.7	48.6	57.3	39.0	2
23	DKC67-88	Monsanto	117	GENVT3P	98.4	66.0	124.0	53.3	58.7	31.5	44
24	DKC66-86	Monsanto	116	GENVT3P	92.9	64.0	119.6	43.6	57.2	35.3	10
25	TMF2L871	Mycogen	117	RR	95.0	66.0	130.1	52.9	61.8	33.7	22
26	TMF2L825	Mycogen	117	HX1RR	98.5	69.0	127.7	47.8	58.5	37.3	3
27	F2F714	Mycogen	113	HXXTRR, BMR	100.0	68.0	126.1	52.1	59.4	29.3	48
28	F2F626	Mycogen	109	SSX, BMR	96.4	66.0	124.8	52.4	58.0	31.3	46
29	1725H	Triumph	117	HXI/RR	99.5	66.0	123.5	46.3	61.1	36.7	4
30	TRX21801H	Triumph	118	HXI/RR	99.5	69.0	128.6	59.2	59.5	34.9	12
31	TRX11358H	Triumph	113	HXI/RR	92.5	66.0	116.4	50.1	56.5	35.6	9
32	70R50	Blue River Hybrids	114	None	95.9	62.0	108.8	40.8	54.4	32.3	36
33	71M36	Blue River Hybrids	115	None	86.3	65.0	114.0	42.3	59.7	32.3	37
34	73B33	Blue River Hybrids	115	None	96.6	68.0	127.0	46.2	60.0	33.4	25
35	76H50	Blue River Hybrids	116	None	99.5	66.0	124.5	47.1	60.0	33.3	26
36	WXU12-1/2	Texas A&M AgriLife	118	RR/RW	93.4	69.0	128.3	57.7	65.8	32.7	31
37	WXU12-3	Texas A&M AgriLife	118	RR/RW	99.0	69.0	109.7	51.2	71.6	27.3	50
38	WXU12-4	Texas A&M AgriLife	116	RR/RW	82.4	66.0	124.4	39.0	61.3	36.4	6
39	WXU12-5	Texas A&M AgriLife	118	RR/RW	99.0	69.0	130.4	55.5	66.5	34.3	19
40	WXU12-6	Texas A&M AgriLife	118	RR/RW	94.4	69.0	125.6	49.2	63.9	31.9	40

Table 1. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Etter, Texas in 2012 (continued).

ENO	Hybrid	Company	RM	Traits	Days to		Plant ht, in.	Ear ht, in	Moist, %	Yield, tons/a	Yield rank
					Stand %	pollen shed					
41	WXU12-7	Texas A&M AgriLife	117	RR/RW	100.0	68.0	127.3	48.2	64.2	31.7	43
42	WXU12-8	Texas A&M AgriLife	118	RR/RW	99.5	69.0	121.7	47.8	63.8	32.4	35
43	WXU12-10	Texas A&M AgriLife	118	RR/RW	91.7	69.0	125.1	49.0	62.5	32.7	33
44	WXU12-11	Texas A&M AgriLife	118	RR/RW	93.1	69.0	122.2	53.4	62.4	33.7	21
45	WXU12-12	Texas A&M AgriLife	116	RR/RW	91.6	66.0	117.3	45.5	58.9	32.7	30
46	WXU12-13	Texas A&M AgriLife	118	RR/RW	97.5	69.0	127.3	50.1	62.2	35.7	7
47	WXU12-14/15	Texas A&M AgriLife	118	RR/RW	93.4	69.0	121.7	50.5	68.6	30.0	47
48	WXU12-116	Texas A&M AgriLife	118	RR/RW	97.1	69.0	120.2	48.4	63.9	34.2	20
49	WXU12-17	Texas A&M AgriLife	118	RR/RW	99.0	68.0	122.2	47.4	62.7	32.7	32
50	WXU12-18	Texas A&M AgriLife	112	BMR	97.5	64.0	116.5	48.0	53.1	28.3	49
	Commercial mean				95.6	65.5	121.2	45.4	58.0	33.9	
	Test mean				95.5	66.3	121.6	46.6	59.6	33.5	
	AgriLife mean				95.2	68.1	122.7	49.4	63.4	32.4	
	CV%				4.8	1.3	6.7	11.6	4.4	6.7	
	LSD 0.05				7.4	1.4	13.3	8.8	4.2	3.7	

ENO = entry number, RM = relative maturity, YG= Yield Guard insect resistance, HX= Herculex insect resistance, RR2= Roundup Ready Corn 2 herbicide resistance; VT3 = CRW + RR2 + YG. BM3 = brown midrib conferred by *bm3* gene.

Table 2. Forage quality of the State Silage Corn Performance Test at Etter, Texas in 2012.

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD24	NDFD24	MILK1	MILK2	Ash
1	1262 PRO2	Armor Seed	7.4	22.0	36.3	3.3	50.0	40.5	75.0	79.7	44.0	3036.0	3364.0	4.80
2	1415 PRO3	Armor Seed	7.7	18.0	31.0	3.2	55.0	45.8	79.0	83.7	46.3	3170.0	3541.0	4.80
3	1330 PRO3	Armor Seed	7.3	22.0	36.5	3.2	50.0	42.1	74.0	78.7	41.7	2901.0	3243.0	5.10
4	1550 PRO3	Armor Seed	7.3	22.0	36.5	3.3	50.0	41.8	72.0	77.3	37.7	2805.0	3143.0	4.90
5	1770 PRO3	Armor Seed	8.0	21.0	35.3	3.3	50.0	41.3	75.0	80.0	42.3	2995.0	3330.0	5.10
6	1850PRO3	Armor Seed	7.2	24.0	41.4	3.5	46.0	37.9	72.0	75.7	40.7	2848.0	3155.0	4.50
7	XP8910RR	B-H Genetics	7.7	26.0	43.0	3.7	43.0	34.0	68.0	73.7	38.3	2639.0	2914.0	5.70
8	XP8977RR/HX	B-H Genetics	8.2	22.0	36.0	3.5	50.0	40.9	76.0	80.0	44.7	3056.0	3387.0	4.90
9	BH9018VTTP	B-H Genetics	7.4	25.0	42.3	3.7	44.0	34.9	73.0	77.0	45.0	2931.0	3213.0	5.40
10	X12011GTR	B-H Genetics	7.5	19.0	32.9	3.2	53.0	44.5	77.0	81.7	44.7	3118.0	3479.0	4.60
11	BH8933VT3	B-H Genetics	7.6	26.0	41.6	3.5	44.0	35.1	71.0	76.0	42.7	2838.0	3122.0	6.00
12	X11152VTTP	B-H Genetics	7.6	21.0	35.1	3.2	50.0	40.6	76.0	80.3	44.3	3070.0	3399.0	5.30
13	BH8895VTTP	B-H Genetics	7.2	24.0	39.3	3.4	47.0	38.3	74.0	77.7	43.7	2964.0	3274.0	5.20
14	BH8719RR/HXT	B-H Genetics	7.6	23.0	37.6	3.3	48.0	37.9	75.0	79.7	45.3	3083.0	3389.0	5.40
15	BH9029VTTP	B-H Genetics	7.5	25.0	42.0	3.6	44.0	35.3	72.0	76.0	43.0	2913.0	3200.0	5.00
16	X12107GT3	B-H Genetics	7.6	23.0	39.2	3.4	47.0	38.2	73.0	77.7	43.3	2934.0	3244.0	5.10
17	CX12117	CPS/DynaGro	7.5	22.0	37.5	3.4	49.0	38.2	75.0	79.0	44.3	3056.0	3366.0	4.90
18	D56VP24	CPS/DynaGro	7.3	25.0	41.9	3.4	45.0	37.2	71.0	75.7	42.0	2778.0	3080.0	5.50
19	D57VP51	CPS/DynaGro	6.7	24.0	40.0	3.4	47.0	39.6	71.0	75.3	37.7	2743.0	3064.0	4.60
20	D58VP30	CPS/DynaGro	7.3	23.0	38.7	3.5	48.0	39.2	73.0	77.3	41.3	2894.0	3211.0	4.90
21	GAG8551	Golden Acres Genetics	7.6	24.0	41.4	3.5	45.0	35.6	72.0	76.3	43.0	2878.0	3166.0	5.40
22	GAX6156RR	Golden Acres Genetics	7.3	27.0	43.6	3.6	43.0	33.8	72.0	75.0	42.7	2921.0	3195.0	4.80
23	DKC67-88	Monsanto	7.1	27.0	43.4	3.7	43.0	34.5	71.0	74.7	40.7	2820.0	3100.0	5.00
24	DKC66-86	Monsanto	7.5	21.0	36.1	3.3	50.0	41.2	75.0	78.7	40.7	2991.0	3325.0	4.60
25	TMF2L871	Mycogen	7.8	24.0	40.0	3.5	46.0	35.0	73.0	77.3	42.7	2964.0	3248.0	5.40



Table 2. Forage quality of the State Silage Corn Performance Test at Etter, Texas in 2012 (continued).

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD24	NDFD24	MILK1	MILK2	Ash
26	TMF2L825	Mycogen	7.0	25.0	40.8	3.3	46.0	36.5	71.0	75.7	40.3	2805.0	3101.0	5.50
27	F2F714	Mycogen	7.9	25.0	41.8	3.7	45.0	34.7	74.0	78.7	49.7	3162.0	3443.0	4.60
28	F2F626	Mycogen	7.5	25.0	42.7	3.4	44.0	34.5	74.0	79.0	51.3	3129.0	3409.0	5.10
29	1725H	Triumph	7.7	24.0	40.4	3.5	45.0	36.8	73.0	76.7	43.0	2917.0	3215.0	5.20
30	TRX21801H	Triumph	6.8	27.0	45.0	3.5	42.0	33.4	68.0	72.7	38.7	2673.0	2944.0	5.30
31	TRX11358H	Triumph	7.4	23.0	38.6	3.5	48.0	38.5	73.0	77.7	42.0	2896.0	3208.0	5.20
32	70R50	Blue River Hybrids	7.6	20.0	32.9	3.2	53.0	44.8	76.0	80.7	41.3	3031.0	3394.0	4.60
33	71M36	Blue River Hybrids	8.0	24.0	39.7	3.6	45.0	35.1	75.0	79.0	47.0	3096.0	3381.0	5.70
34	73B33	Blue River Hybrids	7.5	28.0	45.9	3.7	40.0	30.2	69.0	74.0	43.7	2799.0	3044.0	6.20
35	76H50	Blue River Hybrids	7.2	29.0	47.1	3.8	40.0	31.4	70.0	73.7	43.7	2838.0	3092.0	5.40
36	WXU12-1/2	Texas A&M AgriLife	8.3	29.0	46.6	3.8	38.0	27.4	68.0	72.3	40.3	2741.0	2963.0	6.10
37	WXU12-3	Texas A&M AgriLife	7.6	31.0	49.6	4.3	36.0	23.9	65.0	69.0	38.3	2595.0	2789.0	6.30
38	WXU12-4	Texas A&M AgriLife	7.6	26.0	42.1	3.7	44.0	31.8	71.0	75.0	41.0	2818.0	3076.0	5.30
39	WXU12-5	Texas A&M AgriLife	7.9	33.0	52.7	4.6	33.0	20.2	66.0	69.7	41.7	2640.0	2804.0	6.50
40	WXU12-6	Texas A&M AgriLife	8.0	26.0	43.3	3.5	42.0	32.4	71.0	75.3	43.3	2896.0	3159.0	5.80
41	WXU12-7	Texas A&M AgriLife	8.1	27.0	43.3	3.6	42.0	31.3	71.0	75.0	42.3	2916.0	3169.0	5.50
42	WXU12-8	Texas A&M AgriLife	7.7	29.0	46.7	3.9	39.0	26.9	68.0	72.0	40.3	2763.0	2981.0	6.00
43	WXU12-9	Texas A&M AgriLife	7.9	28.0	45.4	3.7	40.0	30.1	70.0	73.7	41.7	2831.0	3075.0	5.70
44	WXU12-11	Texas A&M AgriLife	7.5	29.0	47.0	3.9	39.0	30.1	67.0	71.7	40.0	2672.0	2916.0	5.80
45	WXU12-12	Texas A&M AgriLife	7.0	30.0	48.3	4.2	38.0	27.7	66.0	71.0	40.3	2649.0	2873.0	6.10
46	WXU12-13	Texas A&M AgriLife	7.6	29.0	47.1	4.1	39.0	29.1	67.0	71.3	38.7	2670.0	2906.0	5.50
47	WXU12-14/15	Texas A&M AgriLife	7.8	25.0	41.3	3.7	45.0	35.3	72.0	76.3	42.7	2897.0	3182.0	5.40
48	WXU12-16	Texas A&M AgriLife	8.1	30.0	47.2	4.2	37.0	25.8	70.0	73.7	44.7	2879.0	3089.0	6.80
49	WXU12-17	Texas A&M AgriLife	8.2	29.0	46.7	4.1	38.0	29.1	68.0	73.0	42.0	2751.0	2987.0	6.30
50	WXU12-18	Texas A&M AgriLife	7.9	25.0	40.8	3.6	45.0	36.5	74.0	78.3	46.7	3078.0	3373.0	5.30

Table 2. Forage quality of the State Silage Corn Performance Test at Etter, Texas in 2012 (continued).

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD24	NDFD24	MILK1	MILK2	Ash
	Commercial													
	mean		7.5	23.7	39.5	3.5	46.7	37.7	73.1	77.5	43.0	2934.1	3239.5	5.1
	Test mean		7.6	25.1	41.4	3.6	44.6	35.1	71.8	76.2	42.5	2889.8	3174.5	5.4
	AgriLife mean		7.8	28.4	45.9	3.9	39.7	29.2	68.9	73.2	41.6	2786.4	3022.8	5.9
	CV%		4.8	12.5	11.6	8.3	10.6	14.0	4.2	4.2	5.3	4.9	5.5	7.50
	LSD 0.05		0.6	5.1	7.8	0.5	7.3	8.0	4.9	5.1	3.7	229.9	280.6	0.65

1. IVTD24: *In vitro* true digestibility (IVTD) after 24 hours of incubation in rumen fluid. It measures digestibility and can be used to estimate energy. A higher value of IVTD 24 hr presents a better forage quality.

2. Forage nutritional values based on NIR analysis.

ADF: Acid detergent fiber, a measure of cellulose and lignin. ADF is negatively correlated with overall digestibility.

CP: Crude protein, the total protein in the sample including true protein and non-protein nitrogen.

Lignin: undigestible plant component and has a negative impact on cellulose digestibility.

NDF: Neutral detergent fiber, a measure of hemicellulose, cellulose and lignin representing the fibrous bulk of the forage. NDF is negatively correlated with intake

NFC: Percentage of non-fibrous carbohydrates; estimates the amount of rapidly digestible carbohydrates in a forage.

NDFD24: Percentage of NDF that is digestible by *in vitro* incubation.

MILK 1: Estimated lbs. of milk produced per ton of dry matter.

MILK 2: Estimated lbs. of milk produced per ton of processed dry matter.

Starch: primarily in the grain, later maturing hybrids have lower starch since all hybrids were harvested at the same time.

TDN: Total digestible nutrients. It represents the sum of the digestible protein, digestible nitrogen-free extract, digestible crude fiber and 2.25X the digestible fat.

Milk lbs./ton of DM: an estimated potential milk yield per ton of forage dry matter based on digestibility and energy content of the forage.

Table 3. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Halfway, Texas in 2012.

ENO	Hybrid	Company	RM	Traits	Stand %	Days to pollen shed	Plant ht, in.	Ear ht, in	Moist, %	Yield, tons/a	Yield rank
1	1262 PRO2	Armor Seed	112	VT2 PRO	101.6	67.0	100.4	38.2	46.7	20.5	50
2	1415 PRO3	Armor Seed	114	VT3 PRO	93.5	69.0	99.5	38.2	51.6	23.1	48
3	1330PRO3	Armor Seed	114	VT3 PRO	101.2	68.0	101.4	40.0	40.9	28.5	20
4	1550 PRO3	Armor Seed	115	VT3 PRO	102.0	67.0	90.8	35.8	45.5	27.4	32
5	1770 PRO3	Armor Seed	117	VT3 PRO	101.2	69.0	94.4	37.0	48.7	28.8	17
6	1850PRO3	Armor Seed	118	VT3 PRO	100.0	71.0	99.9	42.1	42.8	29.2	13
7	XP8910RR	B-H Genetics	118	RR2	102.0	70.0	117.1	49.5	43.1	28.9	15
8	XP8977RR/HX	B-H Genetics	117	RR2/HX/LL	92.3	70.0	104.6	42.9	48.4	30.1	8
9	BH9018VTTP	B-H Genetics	118	GENVT3PRO	89.0	71.0	100.7	47.5	47.1	28.0	27
10	BH8933VT3	B-H Genetics	117	VT3 PRO	102.4	72.0	107.9	53.4	42.7	25.1	42
11	X11152VTTP	B-H Genetics	117	GENVT3PRO	97.6	68.0	106.2	47.6	49.6	29.7	11
12	BH8895VTTP	B-H Genetics	116	GENVT3PRO	98.8	70.0	99.9	38.3	43.2	30.3	7
13	BH8719RR/HXT	B-H Genetics	117	RR2/HX/LL/RW	99.6	71.0	104.3	50.3	45.4	26.4	35
14	BH9029VTTP	B-H Genetics	118	GENVT3PRO	97.6	68.0	107.5	44.0	48.5	32.2	3
15	BH9023VT3	B-H Genetics	119	YGCB/RW/RR2	97.6	73.0	114.3	48.6	44.7	28.6	19
16	X12108GT3	B-H Genetics	117	GT/CB/LL/RW	102.4	70.0	106.2	44.6	43.0	24.2	46
17	CX12117	CPS/DynaGro	115	VT3P	100.8	68.0	100.4	45.4	44.7	26.5	34
18	D56VP24	CPS/DynaGro	116	VT3P	101.6	71.0	95.8	41.6	44.8	27.8	30
19	D57VP51	CPS/DynaGro	117	VT3P	100.8	69.0	95.1	38.1	43.6	30.9	5
20	D58VP30	CPS/DynaGro	118	VT3P	100.0	67.0	98.6	43.4	44.4	27.6	31

Table 3. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Halfway, Texas in 2012 (continued).

ENO	Hybrid	Company	RM	Traits	Stand %	Days to pollen shed	Plant ht, in.	Ear ht, in	Moist, %	Yield, tons/a	Yield rank
21	DKC67-88	Monsanto	117	GENVT3P	101.6	69.0	102.8	45.3	46.4	29.2	14
22	DKC66-86	Monsanto	116	GENVT3P	100.8	68.0	96.7	35.4	40.1	25.6	39
23	TMF2L871	Mycogen	117	RR	102.4	71.0	108.9	50.9	48.9	25.6	40
24	TMF2L825	Mycogen	117	HX1RR	100.8	72.0	115.0	51.2	40.3	30.6	6
25	F2F714	Mycogen	113	HXXTRR, BMR	101.6	70.0	112.5	51.8	44.8	25.0	44
26	F2F626	Mycogen	109	SSX, BMR	100.4	71.0	109.2	47.8	45.4	28.0	28
27	1725H	Triumph	117	HXI/RR	100.4	70.0	107.9	45.8	48.3	29.3	12
28	TRX21801H	Triumph	118	HXI/RR	102.0	72.0	108.0	48.4	34.8	29.7	10
29	TRX11358H	Triumph	113	HXI/RR	99.6	71.0	101.3	46.7	44.9	33.4	2
30	70R50	Blue River Hybrids	114	None	95.5	68.0	99.7	42.0	42.3	25.1	43
31	76H50	Blue River Hybrids	116	None	101.2	70.0	97.6	42.1	46.1	26.4	36
32	71M36	Blue River Hybrids	115	None	101.6	69.0	107.2	49.6	49.2	28.1	25
33	73B33	Blue River Hybrids	115	None	100.0	70.0	107.1	42.0	50.3	28.1	23
34	WXU12-1	Texas A&M AgriLife	118	RW/RR	94.7	74.0	100.4	45.9	51.1	25.5	41
35	WXU12-2	Texas A&M AgriLife	118	RR/RW	100.4	72.0	106.8	48.3	49.9	28.2	22
36	WXU12-3	Texas A&M AgriLife	118	RR/RW	102.4	74.0	103.8	47.5	49.8	29.9	9
37	WXU12-4	Texas A&M AgriLife	116	RR/RW	101.2	73.0	107.6	49.0	53.1	28.2	21
38	WXU12-5	Texas A&M AgriLife	118	RR/RW	95.9	73.0	114.0	52.5	54.0	28.0	29
39	WXU12-6	Texas A&M AgriLife	118	RR/RW	101.6	71.0	102.6	42.5	50.1	28.8	16
40	WXU12-7	Texas A&M AgriLife	117	RR/RW	99.6	73.0	108.5	49.3	50.2	28.7	18

Table 3. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Halfway, Texas in 2012 (continued).

ENO	Hybrid	Company	RM	Traits	Stand %	Days to pollen shed	Plant ht, in.	Ear ht, in	Moist, %	Yield, tons/a	Yield rank
41	WXU12-8	Texas A&M AgriLife	118	RR/RW	102.4	72.0	104.5	47.8	57.3	24.0	47
42	WXU12-9	Texas A&M AgriLife	118	RR/RW	92.3	72.0	103.4	44.6	49.6	24.7	45
43	WXU12-10	Texas A&M AgriLife	118	RR/RW	96.3	73.0	108.8	44.8	43.9	27.3	33
44	WXU12-11	Texas A&M AgriLife	116	RR/RW	95.1	73.0	102.5	47.6	50.2	21.4	49
45	WXU12-12	Texas A&M AgriLife	118	RR/RW	95.5	73.0	102.4	43.4	45.8	26.3	37
46	WXU12-13	Texas A&M AgriLife	118	RR/RW	94.7	74.0	103.4	45.1	41.2	31.3	4
47	WXU12-14	Texas A&M AgriLife	118	RR/RW	98.4	72.0	96.3	41.1	51.0	28.1	24
48	WXU12-15	Texas A&M AgriLife	118	RR/RW	100.0	73.0	100.8	49.0	40.9	36.2	1
49	WXU12-16	Texas A&M AgriLife	118	RW/RR	98.4	73.0	107.2	47.1	46.6	26.2	38
50	WXU12-17	Texas A&M AgriLife	118	RW/RR	98.4	71.0	103.3	48.0	52.4	28.0	26
	Commercial mean				99.7	69.7	103.6	44.4	45.2	27.8	24.7
	Test mean				99.2	70.7	103.9	45.2	46.6	27.8	25.5
	AgriLife mean				98.2	72.6	104.6	46.4	49.3	27.7	26.8
	CV%				4.7	1.3	6.9	10.5	11.7	13.2	
	LSD 0.05				ns	1.5	11.6	7.7	8.9	5.9	

ENO = entry number, RM = relative maturity, YG= Yield Guard insect resistance, HX= Herculex insect resistance, RR2= Roundup Ready Corn 2 herbicide resistance; VT3 = CRW + RR2 + YG. Hybrid yields with the same letters are not significantly different from each other at 5% level.

Table 4. Forage quality of the State Silage Corn Performance Test at Halfway, Texas in 2012.

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD24	NDFD24	MILK1	MILK2	Ash
1	1262 PRO2	Armor Seed	7.7	15.0	26.6	2.9	60.0	51.1	81.0	85.7	46.0	3304.0	3718.0	3.80
2	1415 PRO3	Armor Seed	7.1	21.0	36.4	3.3	51.0	40.8	75.0	79.0	42.3	3016.0	3347.0	4.20
3	1330PRO3	Armor Seed	7.5	20.0	34.6	3.4	52.0	42.3	78.0	81.7	46.3	3207.0	3550.0	4.30
4	1550 PRO3	Armor Seed	7.4	18.0	32.4	2.8	54.0	45.4	78.0	81.0	42.0	3126.0	3494.0	4.00
5	1770 PRO3	Armor Seed	7.2	20.0	35.1	3.3	52.0	41.9	75.0	79.0	40.7	2967.0	3307.0	4.50
6	1850PRO3	Armor Seed	7.5	20.0	35.4	3.3	52.0	42.7	75.0	79.3	41.0	3013.0	3359.0	3.90
7	XP8910RR	B-H Genetics	6.8	22.0	37.2	3.4	50.0	40.0	74.0	78.0	41.0	2940.0	3264.0	4.50
8	XP8977RR/HX	B-H Genetics	7.3	22.0	38.4	3.1	48.0	39.4	75.0	78.0	42.3	3028.0	3347.0	4.30
9	BH9018VTTP	B-H Genetics	7.5	22.0	37.0	3.1	50.0	40.6	76.0	80.0	45.7	3079.0	3408.0	4.70
10	BH8933VT3	B-H Genetics	7.4	22.0	35.9	3.3	51.0	41.2	74.0	78.7	40.3	2965.0	3299.0	4.50
11	X11152VTTP	B-H Genetics	7.7	22.0	38.7	3.4	48.0	39.0	75.0	79.0	45.3	3042.0	3359.0	4.80
12	BH8895VTTP	B-H Genetics	7.0	19.0	34.2	2.9	53.0	44.7	77.0	80.7	44.7	3076.0	3438.0	4.20
13	BH8719RR/HXT	B-H Genetics	7.8	20.0	33.9	3.2	52.0	42.4	78.0	81.7	46.3	3209.0	3553.0	4.20
14	BH9029VTTP	B-H Genetics	7.3	24.0	41.1	3.4	46.0	36.3	73.0	76.3	42.0	2945.0	3240.0	4.20
15	BH9023VT3	B-H Genetics	7.0	24.0	41.1	3.6	46.0	36.9	72.0	76.0	41.7	2911.0	3211.0	4.40
16	X12108GT3	B-H Genetics	7.5	20.0	35.0	3.5	52.0	42.3	76.0	80.7	44.7	3064.0	3407.0	4.60
17	CX12117	CPS/DynaGro	7.8	17.0	30.5	2.9	56.0	47.5	78.0	82.3	44.0	3155.0	3537.0	4.00
18	D56VP24	CPS/DynaGro	7.3	19.0	32.5	3.1	54.0	45.5	77.0	81.3	42.3	3056.0	3425.0	4.30
19	D57VP51	CPS/DynaGro	7.2	21.0	36.9	3.3	50.0	42.0	75.0	78.7	42.3	3004.0	3344.0	4.00
20	D58VP30	CPS/DynaGro	7.1	19.0	33.7	3.2	54.0	43.9	78.0	81.7	45.3	3184.0	3540.0	4.00
21	DKC67-88	Monsanto	6.9	24.0	40.6	3.3	46.0	36.5	73.0	76.3	41.7	2945.0	3241.0	4.70
22	DKC66-86	Monsanto	6.8	20.0	35.2	3.0	53.0	43.7	76.0	79.7	42.7	3081.0	3435.0	3.50
23	TMF2L871	Mycogen	7.1	25.0	43.0	3.3	44.0	35.2	72.0	75.3	42.7	2920.0	3205.0	4.40
24	TMF2L825	Mycogen	6.8	21.0	35.7	3.1	51.0	42.1	74.0	78.0	39.7	2909.0	3250.0	4.50
25	F2F714	Mycogen	6.8	27.0	44.7	3.6	43.0	33.9	74.0	76.3	47.0	3058.0	3333.0	4.40

Table 4. Forage quality of the State Silage Corn Performance Test at Halfway, Texas in 2012 (continued).

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD24	NDFD24	MILK1	MILK2	Ash
26	F2F626	Mycogen	7.1	23.0	39.8	3.1	47.0	39.1	77.0	81.0	51.5	3158.0	3469.0	4.60
27	1725H	Triumph	7.5	21.0	36.2	3.2	50.0	41.7	76.0	79.3	43.0	3014.0	3352.0	4.70
28	TRX21801H	Triumph	6.6	25.0	41.0	3.4	46.0	37.0	71.0	75.3	39.7	2846.0	3145.0	4.70
29	TRX11358H	Triumph	7.2	21.0	36.0	3.3	51.0	40.6	74.0	79.0	41.7	2957.0	3287.0	4.90
30	70R50	Blue River Hybrids	7.3	24.0	41.7	3.3	45.0	35.7	73.0	76.7	44.0	2986.0	3276.0	4.80
31	76H50	Blue River Hybrids	7.6	24.0	40.1	3.5	46.0	36.5	75.0	78.0	45.3	3071.0	3367.0	4.90
32	71M36	Blue River Hybrids	7.9	20.0	34.0	3.3	52.0	41.8	76.0	80.7	42.7	3074.0	3413.0	4.60
33	73B33	Blue River Hybrids	7.8	21.0	35.6	3.2	51.0	40.0	75.0	79.3	41.7	3011.0	3335.0	4.80
34	WXU12-1	Texas A&M AgriLife	7.6	24.0	40.5	3.4	46.0	35.4	75.0	77.7	44.7	3074.0	3361.0	4.80
35	WXU12-2	Texas A&M AgriLife	7.6	26.0	44.1	3.7	42.0	31.5	72.0	75.0	43.7	2946.0	3201.0	5.20
36	WXU12-3	Texas A&M AgriLife	7.5	24.0	40.0	3.7	46.0	35.6	71.0	75.7	39.7	2824.0	3112.0	5.40
37	WXU12-4	Texas A&M AgriLife	7.7	26.0	43.0	4.1	43.0	31.1	72.0	75.0	42.3	2885.0	3136.0	5.50
38	WXU12-5	Texas A&M AgriLife	8.3	21.0	35.2	3.3	50.0	39.2	76.0	80.3	45.3	3132.0	3449.0	5.20
39	WXU12-6	Texas A&M AgriLife	7.6	21.0	36.4	3.2	50.0	38.8	74.0	78.7	41.3	3005.0	3320.0	4.80
40	WXU12-7	Texas A&M AgriLife	7.4	22.0	37.6	3.3	49.0	39.0	74.0	78.0	42.3	2994.0	3310.0	4.70
41	WXU12-8	Texas A&M AgriLife	7.4	21.0	35.7	3.2	51.0	40.6	77.0	80.7	45.3	3165.0	3494.0	4.30
42	WXU12-9	Texas A&M AgriLife	7.9	20.0	34.3	3.1	52.0	42.5	75.0	79.3	40.3	2955.0	3299.0	4.80
43	WXU12-10	Texas A&M AgriLife	7.4	22.0	37.7	3.2	49.0	39.8	75.0	78.3	42.7	3049.0	3372.0	4.50
44	WXU12-11	Texas A&M AgriLife	7.6	20.0	33.7	3.3	53.0	42.1	76.0	80.7	42.7	3090.0	3431.0	4.30
45	WXU12-12	Texas A&M AgriLife	7.2	27.0	45.8	3.9	41.0	28.7	70.0	73.0	41.0	2777.0	3010.0	4.80
46	WXU12-13	Texas A&M AgriLife	7.7	21.0	35.1	3.3	51.0	41.9	76.0	80.0	44.0	3085.0	3425.0	4.50
47	WXU12-14	Texas A&M AgriLife	8.1	19.0	32.4	3.1	53.0	43.6	77.0	81.0	42.0	3078.0	3431.0	4.60
48	WXU12-15	Texas A&M AgriLife	7.4	24.0	40.8	3.3	45.0	36.8	72.0	76.3	41.7	2893.0	3191.0	5.00
49	WXU12-16	Texas A&M AgriLife	7.7	23.0	39.1	3.4	47.0	38.7	76.0	79.0	46.0	3158.0	3472.0	4.30
50	WXU12-17	Texas A&M AgriLife	8.3	21.0	35.7	3.2	50.0	40.2	77.0	80.3	45.3	3117.0	3443.0	4.90

Table 4. Forage quality of the State Silage Corn Performance Test at Halfway, Texas in 2012 (continued).

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD24	NDFD24	MILK1	MILK2	Ash
	Commercial													
	mean		7.3	21.3	36.7	3.2	50.2	40.9	75.3	79.2	43.3	3040.0	3371.4	4.4
	Test mean		7.4	21.7	37.2	3.3	49.5	39.9	75.0	78.9	43.2	3031.0	3354.2	4.5
	AgriLife mean		7.7	22.5	38.1	3.4	48.1	38.0	74.4	78.2	43.0	3013.4	3321.0	4.8
	CV%		6.9	17.8	16.4	9.3	11.3	15.4	4.7	4.9	6.1	5.3	6.0	11.60
	LSD 0.05		0.8	ns	ns	0.5	ns	ns	ns	ns	8.1	ns	ns	0.85

1. IVTD24: *In vitro* true digestibility (IVTD) after 24 hours of incubation in rumen fluid. It measures digestibility and can be used to estimate energy. A higher value of IVTD 24 hr presents a better forage quality.

2. Forage nutritional values based on NIR analysis.

ADF: Acid detergent fiber, a measure of cellulose and lignin. ADF is negatively correlated with overall digestibility.

CP: Crude protein, the total protein in the sample including true protein and non-protein nitrogen.

Lignin: undigestible plant component and has a negative impact on cellulose digestibility.

NDF: Neutral detergent fiber, a measure of hemicellulose, cellulose and lignin representing the fibrous bulk of the forage. NDF is negatively correlated with intake

NFC: Percentage of non-fibrous carbohydrates; estimates the amount of rapidly digestible carbohydrates in a forage.

NDFD24: Percentage of NDF that is digestible by *in vitro* incubation.

MILK 1: Estimated lbs. of milk produced per ton of dry matter.

MILK 2: Estimated lbs. of milk produced per ton of processed dry matter.

Starch: primarily in the grain, later maturing hybrids have lower starch since all hybrids were harvested at the same time.

TDN: Total digestible nutrients. It represents the sum of the digestible protein, digestible nitrogen-free extract, digestible crude fiber and 2.25X the digestible fat.

Milk lbs./ton of DM: an estimated potential milk yield per ton of forage dry matter based on digestibility and energy content of the forage.