2010 State Silage Corn Performance Test on the Texas High Plains

Wenwei Xu[1], Thomas Marek[2], Andy Cranmer[3], Bruce Carlson[3], Jonny Beck[4], Brent Bean[5], and Dennis Pietsch[6]

Introduction

Silage corn production plays an increasingly important role in the economic development of Texas, especially on the Texas High Plains. The area's dairy and beef industries require large amount of grain and silage corn. In 2009, Texas planted a total of 2.35 million acres of corn and harvested 140,000 acres for silage with an average yield of 21.0 tons per acre (USDA National Agricultural Statistical Services, www.nass.usda.gov). Most of the silage corn in Texas is grown on the High Plains where a number of dairies and cattle feedlots are located. Selection of a hybrid with high tonnage and good quality is a key decision that a producer makes. Since 2007, we have been evaluating commercial silage corn hybrids through the State Crop Performance Testing Program at the North Plains Research Field at Etter and Texas AgriLife Research station at Halfway (Xu et al, 2007; 2009). Commercial seed companies have an opportunity to enter hybrids at either or both test sites on a fee basis. To our knowledge, this is the only public field testing available on the Texas High Plains. Our goal is to provide producers with timely and unbiased information regarding yield, quality, and agronomic traits.

2010 State Silage Corn Performance Test at Halfway

Field operation: The test was conducted under a center pivot at the Texas AgriLife Research Station at Halfway. It involved 22 commercial hybrids and six experimental hybrids from the Texas AgriLife Research corn breeding program located in Lubbock (Table 1). Eight of the hybrids do not have transgenic traits and are suitable for organic corn production. F2F622 is a brown midrib silage hybrid. The test used a randomized complete block design with three replications, four-row plots, 18 feet in length, 40-inch row spacing, and 2-foot alleys. The test was planted on April 28 and harvested on August 23. The previous crop was cotton. Due to record rainfall and good soil moisture, the field was not irrigated prior to planting. Granular urea and mono-ammonium phosphate were broadcast on March 23 at the rate of 200 lbs N/a and 50 lbs P/a. Fertilizers were immediately incorporated into the soil by using an offset disk. Seedbeds were listed on March 27 using a disc-bedder plow. A mix of atrazine at 1.5 lb/a and Dual II magnum at 1.33 pts/a was applied preplant on April 30. Lorsban 15G was applied at 6.5 lbs/a through the planter units to control corn rootworm. At three-leaf stage, seedlings were hand-thinned to achieve a uniform target population of 31,954 plants/a. On June 2, liquid nitrogen (UAN) was side dressed at a rate of 100 lbs N/a. The field was regularly irrigated with a total of 14.58 acre-inches water applied from planting to harvest. In-season rainfall totaled 11.03 inches.

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Data was recorded on stand, flowering dates, plant and ear height, root and stalk lodging, and moisture content at harvest. Two center rows of each plot were harvested on August 23 (average milk line at 50%) using a John Deere 5200 small-plot silage chopper equipped with a Hagie silage plot weighing system. Plants were cut 5 inches above the ground. Approximately 2 lbs of a chopped sub-sample were collected from each plot, weighed for fresh weight, dried at 50^0C, 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.

Results: Forage yields of the 28 hybrids tested at the Halfway location differed significantly, ranging from 26.90 to 33.42 tons/a, with an average of 30.30 tons/a at the adjusted 65% moisture level. The top five yielding hybrids were Integra 9701VT3 (33.42 tons/a), TMF2L844 (33.35 tons/a), WXY10B (32.91 tons/a), DKC67-88 (32.58 tons/a), and 8539R (32.32 tons/a). No hybrid yielded significantly higher or lower than the test mean (Table 1).

The whole plant moisture at harvest was 64.7% ranging from 60.3% (F2F622) to 69.5% (WXY10D). The low C.V. values of 7.63% for forage yield and 2.6% for forage moisture indicated that this was, in general, a good and uniform test.

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 66 to 70 with an average of 67.9. Five hybrids (CX10115, 70R50, CX10617, 58VP30, and Integra 9676VTPRO) shed pollen 66 days after planting, significantly earlier than the test mean. Four hybrids shed pollen 70 days after planting, significantly later than the test mean (Table 1). There was no stalk or root lodging in this test.

Silage quality was assayed with NIR. Most of the analyzed quality traits were significantly 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 68.0% to 79.0% with an average of 74.9%. IVTD24 values ranged from 70.7% to 83.0%. A high value of TDN and IVTD24 means higher digestibility. Digestibility of corn silage is highly correlated to the amount of grain produced. In this trial as % starch (comes from the grain) increased so did TDN and IVTD24. It is interesting to note that the brown midrib hybrid FZF622, did not have a low lignin content compared to the other hybrids and its IVTD24 and NDFD24 values were very close to the test mean. Similar to 2009, the average forage quality of the Halfway test was slightly better than the Etter test, as indicated by the TDN and IVTD24.

2010 State Silage Corn Performance Test at Etter

Field operation: The test was conducted on a center pivot field at the Texas AgriLife North Plains Research Field at Etter and had 27 commercial hybrids and 6 experimental hybrids from the Texas AgriLife Research corn breeding program located in Lubbock (Table 3). Ten hybrids have no transgenic traits and may be suitable for organic corn production. FZF622 is a brown midrib silage hybrid. Relative maturity is reported by the seed companies, mostly from 116-120 days. The test was planted on May 3 and harvested on September 2, 2010. The test used a randomized complete block design with three replications. Each plot consisted of four rows, 18 feet long with 30-inch row spacing and 2-foot alleys between plots. Rows were parallel to the pivot track, but generally oriented east to west. The previous crop was wheat, followed by summer fallow. Granular urea and mono-ammonium phosphate were broadcast on April 11 at the rate of 336 lbs N/a and 157 lbs P/a (P_2O_5). Fertilizers were immediately incorporated into the

soil by disking twice. Seedbeds were listed on April 12 using a lister-bottom plow. Atrazine 4L® at the rate of 0.75 lb./a and Dual II magnum at 1.67 pts/a were broadcast applied pre-plant on March 18, 2010, and a rolling cultivator to incorporate the herbicides. 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 32,912 plants/a. The procedure for harvesting and sample processing was the same as at the Halfway location.

The test site had a full soil moisture profile at planting due to an abundance of winter and spring rainfall. Monthly rainfall prior to planting was 0.05" in January, 0.68" in February, 1.75" in March, and 1.90" in April. Total rainfall from planting to harvest (May to August) was 4.38". The field was irrigated regularly at the 100% ET level through a center-pivot irrigation system fitted with LESA emitters at 60" spacing. A total of 17.73 acre-inch water was applied during the season. During the growing season, plants were injured from four hail storms early in the season and lower leaves were damaged.

Results: Forage yields ranged from 26.42 to 34.94 tons/a with an average of 31.36 tons/a at the adjusted 65% moisture level (Table 3), slightly lower than the average yield of 32.58 tons/a in 2009. The top five yielding hybrids were Triumph 1825V (34.94 tons/a), Golden Acres GA X6515 (34.38 tons/a), Wilbur-Ellis Integra 9701VT3 (33.88 tons/a), Golden Acres GA 28V71 (33.79 tons/a), and B-H Genetics BH9018VTTP (33.62 tons/a). Three hybrids (X9150G, 70R50, and WXY10E) yielded significantly lower than the test mean.

All hybrids had excellent plant stands, equal or close to the target population of 32,912 plants per acre. Days to pollen shed were significantly different among the hybrids, ranging from 66 days to 73 days. Three hybrids (70R50, 74A60, and CX10115) shed pollen significantly earlier than the test mean (69.8 days) and five hybrids much later than the test mean (Table 3). The whole plant moisture at harvest time was 58.79% ranging from 53.9% to 65.1%, slightly lower than the desirable target moisture. This field was harvested a few days later than planned due to the mechanical problems of our silage chopper.

The C.V. values of 5.9% for forage yield and 3.5% for forage moisture indicated that this was a very uniform test; the field was well managed; plant population was uniform; fertilizer, and water were sufficient. There was no noticeable stalk or root lodging at harvest. Silage quality was estimated on NIR and most quality traits were not significantly different among hybrids (Table 4).

Summary

Hybrid selection is an important decision for silage corn producers. Consistency across environments is an important consideration. At the two locations three hybrids 1825V, 952115GT and 9701VT3 ranked in the top seven in yield at both locations. Of these three hybrids, 9701VT3 had the highest digestibility with IVTD24 values of 80 and 82% at Etter, and Halfway, respectively. A range of silage hybrids are available on the market, including dual-type hybrids, leafy hybrids, and brown midrib (BMR) hybrids. High tonnage, high energy, and high digestibility are key factors for a good silage hybrid. A good silage hybrid should be high in protein, starch, TDN, and IVTD24 and low in ADF, NDF, and lignin. Maturity is an important factor for choosing a hybrid since the moisture level is critical for ensiling and there is a narrow window for chopping silage. The relative maturity rating of a particular hybrid by a company may be preliminary and not comparable for the tested silage hybrids. Care must be taken when selecting a hybrid based solely on its relative maturity rating as the ratings for silage hybrids among commercial companies do not compare well. Organic corn producers should

choose a hybrid that does not have biotech traits. These results are available at the State Crop Performance Test Program (http://varietytesting.tamu.edu) and the Texas AgriLife Research Lubbock Center websites (http://lubbock.tamu.edu). These results will help producers, Extension specialists and consultants select commercial hybrids best suited to the Texas High Plains.

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References

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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 Halfway, Texas in 2010.

ENO	Hybrid	Company	RM	Traits	Stand %	Days to pollen shed	Plant ht, in.	Ear ht, in	Moist., %	Yield, tons/a	Yield rank	Duncan's Test
1	BH 8895VTTP	B-H Genetics	118-120	VT Triple Pro	96.6	69.0	109.1	41.9	65.8	31.09	9	abcdefg
2	BH9018VTTP	B-H Genetics	118-120	VT Triple Pro	93.9	67.0	112.5	49.9	63.8	30.27	16	abcdefgh
3	X9150G	B-H Genetics	116-118	GT	90.9	67.0	112.7	45.5	64.3	28.98	21	cdefgh
4	X9151G	B-H Genetics	115-117	GT	96.2	67.0	117.7	50.7	65.7	30.74	12	abcdefg
5	70R50	Blue River Hybrids	114	Non-GMO	98.1	66.0	112.9	44.2	61.5	27.61	27	gh
6	73B33	Blue River Hybrids	114	Non-GMO	96.2	67.0	116.3	46.1	66.4	29.09	20	cdefgh
7	58VP30	CPS DynaGro	118	VT Pro	96.6	66.0	112.5	47.4	62.5	28.70	23	defgh
8	56VP69	CPS DynaGro	116	VT Pro	86.0	67.0	108.1	47.9	61.8	29.21	19	bcdefgh
9	CX10617	CPS DynaGro	117	VT3	94.3	66.0	109.4	39.4	64.7	28.51	24	efgh
10	CX10115	CPS DynaGro	115	GT	91.7	66.0	97.8	33.6	63.9	26.90	28	h
11	DKC67-88	Monsanto	117	GENVT3P	98.1	68.0	115.7	50.4	63.7	32.58	4	abc
12	F2F622	Mycogen	109	XLI/RRLL, bm3	97.0	67.0	114.8	45.1	60.3	29.99	17	abcdefgh
13	TMF2W727	Mycogen	113	HXXT/RRLL	98.9	68.0	117.7	47.4	66.6	30.45	14	abcdefgh
14	TMF2N804	Mycogen	116	HXI/RRLL	96.6	70.0	124.3	39.6	68.3	30.83	11	abcdefg
15	TMF2L844	Mycogen	118	RR2	95.5	69.0	125.3	50.5	67.6	33.35	2	a
16	1825V	Triumph Seed	118	VT3	95.5	69.0	121.3	45.7	64.4	31.66	7	abcdef
17	8539R	Triumph Seed	118	RR	88.3	70.0	125.2	45.8	68.9	32.32	5	abcd
18	2288H	Triumph Seed	122	HX1/RR	93.9	70.0	122.4	52.2	66.8	31.34	8	abcdefg
19	Integra EXP 952115GT	Wilbur-Ellis	115	GT	93.2	68.0	120.9	51.2	67.2	32.12	6	abcde
20	Integra 9701VT3	Wilbur-Ellis	120	VT3	91.7	68.0	116.4	49.5	62.8	33.42	1	a
21	Integra 9676VTPRO	Wilbur-Ellis	117	VT3PRO	98.9	66.0	111.4	46.1	63.1	28.93	22	cdefgh
22	Integra 9651VT3	Wilbur-Ellis	115	VT3	98.1	67.0	99.7	33.9	61.4	30.90	10	abcdefg
23	WXY10A	AgriLife (XU)	118	None	98.9	69.0	113.9	52.6	62.5	30.56	13	abcdefgh
24	WXY10B	AgriLife (XU)	118	None	96.2	69.0	117.3	50.8	62.8	32.91	3	ab
25	WXY10C	AgriLife (XU)	117	None	97.0	68.0	111.0	45.8	62.6	29.52	18	bcdefgh

Table 1. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Halfway, Texas in 2010 (continued).

ENO	Hybrid	Company	RM	Traits	Stand %	Days to pollen shed	Plant ht, in.	Ear ht, in	Moist., %	Yield, tons/a	Yield rank	Duncan's Test
26	WXY10D	AgriLife (XU)	118	None	97.0	69.0	110.5	44.1	69.5	27.92	26	fgh
27	WXY10E	AgriLife (XU)	117	None	94.3	68.0	113.6	43.4	66.8	30.38	15	abcdefgh
28	WXY10F	AgriLife (XU)	119	None	90.9	70.0	118.0	47.1	65.8	28.26	25	fgh
	Test mean				95.0	67.9	114.6	46.0	64.7	30.30		
	CV%				5.0	1.4	3.2	7.9	2.6	7.63		
	LSD 0.05				ns	1.6	6.1	6.0	2.7	3.79		

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.
Hybrid yields with the same letters are not significantly different from each other at 5% level.

Table 2. Forage quality of the State Silage Corn Performance Test at Halfway, Texas in 2010.

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD24	NDFD24	MILK1	MILK2	Ash
1	BH 8895VTTP	B-H Genetics	8.3	19.7	34.4	3.2	52.1	45.0	77.0	81.0	43.7	3065.3	3430.3	4.02
2	BH9018VTTP	B-H Genetics	9.3	17.3	30.6	3.2	54.6	47.0	77.0	82.3	41.7	3052.7	3433.0	4.20
3	X9150G	B-H Genetics	9.4	19.2	34.2	3.5	51.7	42.6	76.0	80.0	42.0	3025.0	3370.0	3.80
4	X9151G	B-H Genetics	8.4	22.6	39.0	3.5	47.7	40.0	73.0	76.3	39.0	2885.7	3209.3	3.70
5	70R50	Blue River Hybrids	9.1	17.6	31.6	3.1	53.9	46.6	79.0	82.7	45.0	3193.7	3571.0	3.72
6	73B33	Blue River Hybrids	9.3	19.5	33.9	3.4	51.6	42.8	75.0	79.7	40.0	3001.0	3348.0	3.90
7	58VP30	CPS DynaGro	9.1	19.2	33.1	3.4	52.5	45.4	77.0	81.0	43.0	3058.7	3426.3	4.00
8	56VP69	CPS DynaGro	9.4	20.6	35.9	3.8	49.4	41.0	74.0	78.0	39.3	2966.3	3298.7	3.89
9	CX10617	CPS DynaGro	9.4	19.7	34.8	3.4	50.5	42.7	77.0	80.3	43.7	3087.0	3433.3	4.04
10	CX10115	CPS DynaGro	9.1	17.3	30.8	3.2	54.7	47.0	77.0	82.0	41.7	3079.0	3459.3	3.95
11	DKC67-88	Monsanto	9.1	22.3	38.6	3.7	47.4	38.5	72.0	76.3	38.3	2886.3	3198.3	3.89
12	F2F622	Mycogen	8.5	26.1	44.2	3.9	42.7	36.4	74.0	79.3	53.3	3102.3	3397.0	4.08
13	TMF2W727	Mycogen	9.0	22.6	38.1	3.9	47.5	38.8	74.0	78.0	42.3	2977.3	3291.7	4.44
14	TMF2N804	Mycogen	9.0	22.8	38.7	3.8	46.7	38.5	74.0	77.3	42.0	2952.3	3264.0	4.52
15	TMF2L844	Mycogen	7.9	29.7	48.6	4.3	37.8	28.7	68.0	70.7	39.7	2697.7	2930.0	4.97
16	1825V	Triumph Seed	9.2	18.8	33.3	3.4	52.4	44.3	77.0	80.7	42.3	3068.7	3427.7	3.94
17	8539R	Triumph Seed	8.8	24.4	41.2	3.6	44.4	36.9	72.0	75.3	40.7	2858.3	3158.0	4.59
18	2288H	Triumph Seed	8.6	26.7	45.3	4.0	41.1	32.0	71.0	73.0	39.7	2853.3	3113.3	4.02
19	Integra EXP 952115GT	Wilbur-Ellis	8.4	20.0	34.5	3.3	51.5	44.5	75.0	78.7	39.3	2909.0	3269.7	4.32
20	Integra 9701VT3	Wilbur-Ellis	8.3	24.8	41.9	3.5	44.3	36.7	74.0	76.7	44.0	2965.3	3263.0	4.54
21	Integra 9676VTPRO	Wilbur-Ellis	8.7	21.2	36.4	3.4	50.0	41.8	73.0	77.7	39.0	2875.7	3215.0	4.00
22	Integra 9651VT3	Wilbur-Ellis	9.2	17.1	29.7	3.1	56.1	48.5	78.0	83.0	42.7	3110.0	3502.7	3.75
23	WXY10A	AgriLife (XU)	8.6	20.2	36.0	3.3	50.8	43.1	76.0	80.0	43.3	3066.0	3416.0	3.43
24	WXY10B	AgriLife (XU)	9.5	16.8	29.9	3.1	55.5	47.8	79.0	82.7	41.7	3160.0	3548.0	3.42
25	WXY10C	AgriLife (XU)	9.3	23.7	41.0	3.9	44.6	33.5	74.0	76.3	42.0	3053.3	3325.0	4.03
26	WXY10D	AgriLife (XU)	9.6	23.1	38.5	4.0	46.1	35.7	74.0	77.3	41.7	2977.3	3266.0	4.87
27	WXY10E	AgriLife (XU)	9.8	19.5	32.9	3.7	51.7	42.4	76.0	81.0	41.7	3040.0	3383.0	4.58
28	WXY10F	AgriLife (XU)	9.2	22.6	38.3	3.9	47.0	37.6	74.0	77.0	39.7	2989.7	3294.3	4.09
	Test mean		9.0	21.3	36.6	3.6	49.2	40.9	74.9	78.7	41.9	2998.5	3330.1	4.10
	CV%		5.4	14.7	13.3	10.9	9.0	12.0	3.6	3.9	6.1	3.7	4.2	10.80
	LSD 0.05		0.8	5.1	ns	0.6	7.2	8.1	4.4	5.0	4.2	179.3	228.6	0.73

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 i*ncubation.
   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 Etter, Texas in 2010.

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1	BH 8895VTTP	B-H Genetics	118-120	VT Triple Pro	96.6	69.0	109.8	41.3	59.2	32.34	12	abcdefg
2	BH9018VTTP	B-H Genetics	118-120	VT Triple Pro	95.1	70.0	112.3	42.8	55.7	33.62	5	abc
3	X9150G	B-H Genetics	116-118	GT	96.6	69.0	109.7	37.4	58.5	28.80	31	ijk
4	X9151G	B-H Genetics	115-117	GT	96.1	70.0	118.2	49.0	56.5	33.18	7	abcd
5	70R50	Blue River Hybrids	114	None GMO	92.2	66.0	113.4	45.8	53.9	27.01	32	jk
6	73B33	Blue River Hybrids	114	None GMO	94.6	71.0	113.9	45.1	60.9	30.46	23	defghi
7	71K36	Blue River Hybrids	114	None GMO	94.6	69.0	113.8	48.6	59.2	32.56	10	abcdefg
8	74A60	Blue River Hybrids	115	None GMO	99.0	66.0	108.3	44.5	58.0	29.85	26	efghij
9	58VP30	CPS DynaGro	118	VT Pro	97.5	69.0	114.7	50.0	56.1	32.64	9	abcdef
10	56VP69	CPS DynaGro	116	VT Pro	93.6	69.0	109.6	42.8	57.4	32.12	14	abcdefgh
11	CX10617	CPS DynaGro	117	VT3	95.6	69.0	112.2	41.9	58.8	29.57	28	ghij
12	CX10115	CPS DynaGro	115	GT	94.1	66.0	104.9	40.8	59.8	31.73	17	bcdefghi
13	GA 28V71	Golden Acres Genetics	118	VT3 Pro	96.6	69.0	116.8	46.1	59.3	33.79	4	abc
14	GA X6515	Golden Acres Genetics	119	VT3	95.1	70.0	120.1	52.4	60.2	34.38	2	ab
15	GA X6022	Golden Acres Genetics	117	GTCBLL	95.6	69.0	114.3	47.9	55.9	30.79	20	cdefghi
16	DKC67-88	Monsanto	117	GENVT3P	94.1	71.0	113.4	49.1	59.0	31.61	18	bcdefghi
17	F2F622	Mycogen	109	XLI/RRLL, bm3	98.5	69.0	115.1	45.9	57.8	29.18	29	hijk
18	TMF2W727	Mycogen	113	HXXT/RRLL	96.1	69.0	117.8	43.2	60.0	31.74	16	bcdefghi
19	TMF2N804	Mycogen	116	HXI/RRLL	90.7	73.0	123.0	39.1	60.0	30.40	24	defghi
20	TMF2L844	Mycogen	118	RR2	93.1	73.0	120.7	47.9	58.7	32.15	13	abcdefgh
21	1825V	Triumph Seed	118	VT3	95.6	71.0	115.5	44.4	57.8	34.94	1	a
22	8539R	Triumph Seed	118	RR	85.3	72.0	127.0	52.6	58.4	30.57	21	defghi
23	2288H	Triumph Seed	122	HX1/RR	95.6	73.0	123.8	59.8	63.3	31.57	19	bcdefghi
24	Integra EXP 952115GT	Wilbur-Ellis	115	GT	95.1	71.0	117.7	42.4	58.4	33.25	6	abcd
25	Integra 9701VT3	Wilbur-Ellis	120	VT3	96.6	72.0	113.3	46.3	56.1	33.88	3	ab

Table 3. Means of forage yield adjusted to 65% moisture and agronomic traits of the State Silage Corn Performance Test at Etter, Texas in 2010 (continued).

ENO	Hybrid	Company	RM	Traits	Stand %	Days to pollen shed	Plant ht, in.	Ear ht, in	Mois t%	Yield tons/a	Yield rank	Duncan's Test
26	Integra 9676VTPRO	Wilbur-Ellis	117	VT3PRO	95.1	69.0	112.3	45.8	56.3	32.82	8	abcde
27	Integra 9651VT3	Wilbur-Ellis	115	VT3	97.5	69.0	104.7	36.1	58.7	30.53	22	defghi
28	WXY10A	AgriLife (XU)	117	None	98.5	71.0	119.3	50.9	56.9	29.88	25	efghij
29	WXY10B	AgriLife (XU)	118	None	92.2	70.0	116.0	45.1	61.9	28.89	30	ijk
30	WXY10C	AgriLife (XU)	116	None	98.0	69.0	108.9	37.7	60.0	31.93	15	abcdefgh
31	WXY10D	AgriLife (XU)	118	None	97.1	71.0	113.4	57.0	65.1	32.44	11	abcdefg
32	WXY10E	AgriLife (XU)	117	None	89.2	70.0	114.4	43.4	58.6	26.42	33	k
33	WXY10F	AgriLife (XU)	118	None	94.6	71.0	115.1	45.7	61.9	29.78	27	fghij
	Test mean				95.0	69.8	114.7	45.7	58.7	31.36		
	CV%				4.5	0.8	3.4	10.0	3.5	5.88		
	LSD 0.05				ns	0.9	6.3	7.5	3.3	3.01		

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 Etter, Texas in 2010.

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD 24	NDFD 24	MILK1	MILK2	Ash
1	BH 8895VTTP	B-H Genetics	7.8	19.8	34.8	3.0	51.7	44.7	73.0	78.0	35.7	2843.7	3205.0	3.89
2	BH9018VTTP	B-H Genetics	8.5	21.8	37.3	3.3	48.0	39.7	72.0	76.3	37.3	2793.0	3114.7	4.75
3	X9150G	B-H Genetics	8.1	21.3	37.5	3.1	49.2	41.7	73.0	77.0	38.7	2885.3	3224.0	3.66
4	X9151G	B-H Genetics	8.1	18.5	32.8	2.9	53.7	46.5	76.0	80.0	38.7	2980.0	3357.3	3.59
5	70R50	Blue River Hybrids	8.1	16.3	29.4	2.6	57.8	50.9	78.0	82.0	39.0	3053.7	3466.0	2.86
6	73B33	Blue River Hybrids	8.6	19.2	34.2	3.0	51.5	43.2	75.0	80.0	40.3	3013.0	3363.0	4.09
7	71K36	Blue River Hybrids	8.3	19.5	34.5	3.2	52.0	45.0	75.0	79.0	39.3	2991.7	3356.3	3.47
8	74A60	Blue River Hybrids	8.4	20.1	36.1	3.1	49.6	42.7	74.0	77.7	38.0	2925.7	3271.3	3.87
9	58VP30	CPS DynaGro	8.2	16.6	30.8	2.5	55.7	48.9	77.0	81.3	39.3	3037.3	3433.3	3.38
10	56VP69	CPS DynaGro	8.0	22.7	39.2	3.1	47.1	40.2	72.0	75.3	38.0	2831.0	3157.0	4.02
11	CX10617	CPS DynaGro	8.2	20.9	36.7	3.1	49.6	41.2	74.0	78.0	40.7	2945.3	3278.7	3.98
12	CX10115	CPS DynaGro	8.2	18.3	33.0	2.6	53.4	45.9	76.0	79.3	37.7	2981.0	3353.3	3.48
13	GA 28V71	Golden Acres Genetics	8.1	21.4	37.1	2.9	48.9	40.8	73.0	77.3	38.7	2889.3	3220.0	4.24
14	GA X6515	Golden Acres Genetics	7.7	24.0	40.8	3.4	45.1	37.1	71.0	74.3	37.0	2801.0	3101.3	4.64
15	GA X6022	Golden Acres Genetics	7.9	20.5	35.9	2.9	50.6	43.9	73.0	77.3	37.0	2856.3	3212.0	3.83
16	DKC67-88	Monsanto	8.3	22.5	39.0	3.2	47.1	39.4	72.0	76.0	38.7	2875.7	3195.0	4.08
17	F2F622	Mycogen	7.8	24.6	42.2	3.1	45.0	38.0	75.0	77.3	45.7	3036.0	3343.7	3.86
18	TMF2W727	Mycogen	8.1	23.5	40.1	3.4	46.1	37.4	71.0	75.7	38.3	2812.0	3115.7	4.43
19	TMF2N804	Mycogen	8.6	23.0	39.5	3.3	46.6	37.5	71.0	76.0	39.0	2820.3	3124.0	4.38
20	TMF2L844	Mycogen	8.0	24.1	40.4	3.5	45.8	38.4	71.0	74.7	37.3	2768.3	3079.7	4.35
21	1825V	Triumph Seed	8.1	22.7	39.3	3.6	47.8	39.7	72.0	75.0	36.7	2809.3	3131.3	3.54
22	8539R	Triumph Seed	8.4	20.8	36.7	2.9	49.2	40.8	74.0	77.7	38.7	2922.7	3253.7	4.16
23	2288H	Triumph Seed	8.3	25.7	45.6	3.7	40.6	33.0	70.0	72.3	38.7	2842.0	3110.0	3.95
24	Integra EXP 952115GT	Wilbur-Ellis	7.9	17.3	31.1	2.6	55.7	48.4	77.0	81.0	38.0	3024.3	3416.7	3.25
25	Integra 9701VT3	Wilbur-Ellis	8.0	23.0	40.7	3.4	46.0	38.1	71.0	74.0	36.0	2799.7	3108.0	3.62
26	Integra 9676VTPRO	Wilbur-Ellis	8.1	16.6	30.8	2.5	56.1	48.7	77.0	81.7	40.3	3056.3	3451.0	3.24
27	Integra 9651VT3	Wilbur-Ellis	8.5	18.3	33.1	2.8	53.2	45.7	76.0	80.3	40.0	3037.0	3407.3	3.55
28	WXY10A	AgriLife (XU)	7.9	23.4	41.1	3.1	45.4	36.9	73.0	76.3	41.7	2945.3	3245.0	4.18
29	WXY10B	AgriLife (XU)	8.6	21.7	37.4	3.4	48.2	39.5	74.0	77.7	39.3	2948.7	3268.7	4.26
30	WXY10C	AgriLife (XU)	9.0	20.1	35.7	3.5	49.8	41.7	75.0	78.0	39.7	3018.3	3356.3	3.69

Table 4. Forage quality of the State Silage Corn Performance Test at Etter, Texas in 2010 (continued).

ENO	Hybrid	Company	CP	ADF	NDF	Lignin	NFC	Starch	TDN	IVTD 24	NDFD 24	MILK1	MILK2	Ash
31	WXY10D	AgriLife (XU)	8.7	24.0	41.3	3.7	44.3	34.8	71.0	74.7	39.3	2833.3	3115.7	4.54
32	WXY10E	AgriLife (XU)	8.6	20.9	36.9	3.1	48.9	40.4	74.0	78.0	40.7	2971.3	3299.3	4.17
33	WXY10F	AgriLife (XU)	8.5	21.7	37.9	3.3	47.8	39.6	76.0	78.0	42.0	3070.3	3391.0	3.98
	Test mean		8.2	21.1	36.9	3.1	49.3	41.5	73.7	77.5	39.0	2921.8	3258.3	3.91
	CV%		5.1	17.2	14.7	14.1	10.7	13.4	4.7	4.6	6.5	5.4	6.0	15.30
	LSD 0.05		ns	ns	ns	ns	8.6	9.1	ns	ns	4.1	ns	ns	ns

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.