PR -726

University of Kentucky
College of Agriculture,
Food and Environment
Agricultural Experiment Station

Kentucky Corn Silage Hybrid Performance Report, 2017

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Objective

The objective of the Silage Corn Hybrid Performance Test is to provide unbiased forage yield and quality data for corn hybrids commonly grown for silage in Kentucky.

General Procedures

Hybrids were evaluated for silage performance on cooperating farms. Representatives from seed companies submitted hybrids of their choosing.

University of Kentucky personnel planted the hybrid seeds. Farmers applied the soil fertility and pest management. University of Kentucky personnel harvested, weighed, chopped, and packaged corn for quality analysis. University personnel conducted the statistical analyses and final reporting of hybrid performance.

Every effort was made to conduct the tests in an unbiased manner according to accepted agronomic practices. In some cases, fertilizer rates are above recommendations. Hybrids were arranged in a randomized complete block design with three replications at each farm. Hybrid seed was planted with standard planters at a target seeding rate near 30,000 seeds per acre. Fields were monitored for pests.

When most hybrids were near 35% dry matter (65% moisture), two 10-ft sections of each hybrid were harvested by hand from each plot. The entire harvested corn sample was weighed. All whole plants from each hybrid were processed through a silage chopper and a subsample was collected.

Forage quality analyses and dry matter determination were from composite chopped samples of each hybrid at each location and were analyzed by Dairy One Forage Lab, who also calculated milk yield.

Hybrid performance reported here includes silage yield adjusted to 35% dry matter, milk yield per ton and per acre, net energy for gain and for lactation, in vitro true digestibility, crude protein, acid detergent fiber, neutral detergent fiber, and total digestible nutrients.

Yield was separated using the Least Significant Difference (or LSD). The LSD is a method of separating hybrid performance from field variability. Hybrids with yields within one (1) LSD of each other have a very good chance of performing similar to each other next year.

2017 Season Comments

The 2017 growing season was wet early and dry later with conditions for excellent yields. Despite the excellent conditions, Mercer County was low-yielding and variable. Only two replications were evaluated at Mercer County. Yields were excellent at the other two locations. This year, ratings were assessed for gray leaf spot (GLS) and both rusts together (Rust). This year, rust most likely was common rust; however southern rust may have been present as well. Disease pressure was relatively low at all sites and a foliar fungicide likely would not have increased yields. Note: Gray leaf spot is caused by *Circospora zea-maydis*, common rust is caused by *Puccinia sorghi* and southern rust is caused by *Puccinia polysora*.

This was an excellent year to compare hybrid performance. Total silage yield and milk yield are the two most important performance numbers to compare across hybrids.

We thank our farmer cooperators for hosting the plots and helping with planting, management and harvest of the plots.

Research was conducted by:

Nick Roy, Adair County; Will Stallard, Lincoln County; Ricky Arnett, Green County; Matthew Campbell, Mason County; Linda McClanahan, Mercer; Pat Hardesty, Taylor County; Jonathan Oakes, Russell County; Jerry Little, Boyle County; Colby Guffey, Clinton County; Tiffany Harper, Pulaski County; Jay Hettmansperger, Garrard County; Tommy Yankey, Anderson County; Adam Probst, Woodford County; Clay Stamm, Clark County; Philip Konopka, Lewis County; and David Appleman; Bracken County (all county Extension agents for agriculture and natural resources); Tara McCarty, Mason County Program Assistant; Mason County FFA students; and Chad Lee (Plant and Soil Sciences).

Table 1. Combined Location Average

Hybrid	DM	Tons/A 35% DM	Milk Yield lb/T	Milk Yield lb/A	IVTD	CP	ADF	NDF	TDN	GLS	Rust
AGRIGOLD A645-10VT2RIB	37.4	**25.5**	3,304	**29,599**	82	7.3	23	40	76	1.3	1.3
AGRIGOLD A6544VT2RIB	34.4	**23.9**	3,340	27,963	80	7.1	23	40	73	1.3	1.1
AUGUSTA 1166VT2ProD	34.6	23.1	3,438	27,907	81	7.3	24	41	75	1.4	1.0
AUGUSTA 5465-3000GTD	33.2	22.9	3,250	25,996	79	7.3	28	46	73	1.0	1.3
BECKS 6365AM ™	33.6	22.7	3,676	**29,251**	84	7.4	20	36	78	1.3	1.0
BECKS 6886VR	33.3	**24.6**	3,538	**30,510**	82	7.7	24	43	75	1.1	1.3
BRODBECK 54SX15	32.7	23.0	3,583	28,808	83	7.5	23	41	76	1.1	1.1
BRODBECK 57SX15	34.9	**24.8**	3,367	**29,240**	82	7.1	24	41	75	1.3	1.1
CAVERNDALE CF 1039 VIP 3110	31.2	23.4	3,243	26,826	78	7.5	26	44	72	1.4	1.4
CAVERNDALE CF 888 3000GT	33.1	**23.8**	3,558	**29,694**	83	7.6	23	39	76	1.1	1.3
CHECK	32.5	**23.5**	3,149	26,201	77	7.9	28	47	70	1.4	1.6
DYNAGRO D55VC45	34.9	22.2	3,288	25,580	80	7.6	26	43	74	1.3	1.5
DYNAGRO D57VP75	30.2	23.1	3,248	26,200	78	7.6	29	49	71	1.1	1.6
MASTERS CHOICE MCT6363	35.0	22.0	3,407	26,284	81	7.2	22	38	75	1.1	1.1
MASTERS CHOICE MCT6733	35.2	**24.9**	3,630	**31,736**	85	7.4	21	37	78	1.1	1.4
NK N78S-3111	32.3	23.4	3,562	**29,256**	81	7.1	23	40	76	1.6	1.4
NK N83D-3111	30.8	**25.5**	3,436	**30,487**	82	8.3	25	43	75	1.3	1.6
PIONEER P1637AM	32.5	**23.9**	3,384	28,274	81	7.6	27	43	74	1.3	0.9
PIONEER P2089VYHR	32.8	21.5	3,356	25,143	79	7.5	26	45	73	1.3	1.3
REV 25BHR26	33.8	23.1	3,533	28,687	83	7.5	23	40	77	1.3	1.3
REV 28BHR18	34.3	23.0	3,499	28,190	83	8.4	22	39	76	1.6	1.4
p value		0.0600		<0.0001						ns	0.01
LSD (0.10)		2.1		2,500							0.3
All Location Averages	33.6	23.6	3,426	28,373	81	7.5	24	41	75	1.3	1.3

Percent dry matter (DM) represents the corn forage sample at harvest. Silage yields were adjusted to 35% DM; highest numerical yield is bold with gray box; bold yields are not significantly different from highest yield. Milk yield was calculated through Dairy One Forage Laboratories. Milk per ton was calculated from DM yields. Net energy for lactation (NEL). In vitro true digestibility (IVTD) estimates digestibility from anaerobic fermentation by incubating samples in rumen fluid. Quality measurements are based on dry weight and calculated from composite samples at each site. Higher crude protein (CP) and total digestible nutrients (TDN) values indicate better forage quality. Lower acid detergent fiber (ADF) and neutral detergent fiber (NDF) indicate better forage quality. Disease rates (GLS) and Rust (common and southern) were rated on a scale of 0 to 3, with 1 being at least one plant with expression of disease on any leaf and 3 being every plant in the plot expressing disease to the uppermost leaf.

Table 2. Green County, Kentucky

Hybrid	DM	Tons/A 35% DM	Milk Yield lb/T	Milk Yield lb/A	IVTD	CP	ADF	NDF	TDN	GLS	Rust
AGRIGOLD A645-10VT2RIB	38.4	**26.6**	3,356	**31,273**	83	7.3	22	40	78	1.0	1.0
AGRIGOLD A6544VT2RIB	36.3	27.0	3,421	32,329	82	7.7	19	35	76	1.0	1.0
AUGUSTA 1166VT2ProD	36.2	23.6	3,536	29,185	83	7.2	22	40	78	1.0	1.0
AUGUSTA 5465-3000GTD	36.8	**25.8**	3,533	**31,854**	84	7.6	24	40	78	1.0	1.0
BECKS 6365AM TM	33.7	**23.8**	3,807	**31,646**	86	7.8	17	33	80	1.0	1.0
BECKS 6886VR	33.3	23.0	3,516	**28,295**	82	7.9	25	44	75	1.0	1.0
BRODBECK 54SX15	33.2	24.0	3,694	30,987	84	7.3	22	40	78	1.0	1.0
BRODBECK 57SX15	40.0	28.2	3,504	34,573	87	7.0	18	33	81	1.0	1.0
CAVERNDALE CF 1039 VIP 3110	34.8	27.1	3,621	34,359	84	7.9	21	38	78	1.0	1.0
CAVERNDALE CF 888 3000GT	35.5	**25.8**	3,519	31,814	85	7.7	23	39	77	1.0	1.0
CHECK	34.5	**26.0**	3,513	**31,916**	81	7.7	25	43	76	1.0	1.0
DYNAGRO D55VC45	38.6	**25.3**	3,450	**30,496**	83	7.8	22	39	79	1.0	1.0
DYNAGRO D57VP75	30.9	**24.4**	3,226	**27,513**	77	8.1	30	50	71	1.0	1.0
MASTERS CHOICE MCT6363	37.0	**21.4**	3,582	**26,816**	84	7.4	18	32	79	0.7	1.0
MASTERS CHOICE MCT6733	37.6	24.6	3,528	**30,377**	85	7.8	21	37	78	1.0	1.0
NK N78S-3111	34.1	24.6	3,755	32,353	84	6.9	20	36	79	1.0	2.0
NK N83D-3111	33.3	26.3	3,613	**33,287**	83	8.4	25	43	75	1.0	1.0
PIONEER P1637AM	33.9	**25.2**	3,544	**31,197**	82	8.4	26	43	77	1.0	1.0
PIONEER P2089VYHR	33.5	22.7	3,554	28,296	82	8.2	25	44	76	1.0	1.0
REV 25BHR26	32.5	**21.0**	3,487	**25,574**	81	7.3	26	43	75	1.0	1.0
REV 28BHR18	36.7	**26.8**	3,531	**33,131**	85	8.4	22	38	78	1.3	1.0
p value		0.0200		0.0071						ns	<0.0001
LSD (0.10)		3.2		3,962						ns	0.0
Green Averages	35.4	25.0	3,548	31,052	83	7.7	22	39	78	1.0	1.0

Percent dry matter (DM) represents the corn forage sample at harvest. Silage yields were adjusted to 35% DM; highest numerical yield is bold with gray box; bold yields are not significantly different from highest yield. Milk yield was calculated through Dairy One Forage Laboratories. Milk per ton was calculated from DM yields. Net energy for lactation (NEL). In vitro true digestibility (IVTD) estimates digestibility from anaerobic fermentation by incubating samples in rumen fluid. Quality measurements are based on dry weight and calculated from composite samples at each site. Higher crude protein (CP) and total digestible nutrients (TDN) values indicate better forage quality. Lower acid detergent fiber (ADF) and neutral detergent fiber (NDF) indicate better forage quality. Disease rates (GLS) and Rust (common and southern) were rated on a scale of 0 to 3, with 1 being at least one plant with expression of disease on any leaf and 3 being every plant in the plot expressing disease to the uppermost leaf.

Table 3. Mason County, Kentucky

Hybrid	DM	Tons/A 35% DM	Milk Yield lb/T	Milk Yield lb/A	IVTD	CP	ADF	NDF	TDN	GLS	Rust
AGRIGOLD A645-10VT2RIB	36.3	**27.8**	3,405	33,166	83	7.9	23	38	76	1.7	1.7
AGRIGOLD A6544VT2RIB	32.0	23.5	3,299	27,166	79	7.3	26	42	71	1.7	1.3
AUGUSTA 1166VT2ProD	34.2	25.2	3,472	30,596	83	8.0	23	40	76	2.0	1.0
AUGUSTA 5465-3000GTD	29.7	24.7	2,881	24,871	75	7.7	33	54	67	1.0	1.7
BECKS 6365AM ™	35.1	25.3	3,642	32,214	85	7.7	21	37	79	1.7	1.0
BECKS 6886VR	34.2	**29.5**	3,557	**36,698**	82	8.2	22	40	76	1.3	1.7
BRODBECK 54SX15	31.5	23.1	3,514	28,448	82	8.7	25	43	75	1.3	1.3
BRODBECK 57SX15	32.4	26.9	3,254	30,610	79	7.6	28	45	71	1.7	1.3
CAVERNDALE CF 1039 VIP 3110	29.2	23.2	2,989	24,322	75	7.7	28	47	68	2.0	2.0
CAVERNDALE CF 888 3000GT	30.7	24.6	3,698	31,864	83	8.3	21	37	77	1.3	1.7
CHECK	31.9	25.0	3,054	26,726	76	9.3	27	46	69	2.0	2.7
DYNAGRO D55VC45	30.9	22.5	3,084	24,237	77	8.2	30	48	69	1.7	2.3
DYNAGRO D57VP75	28.3	23.6	3,161	26,091	78	8.1	31	50	70	1.3	2.7
MASTERS CHOICE MCT6363	33.0	26.2	3,361	30,871	80	7.9	27	42	73	1.7	1.3
MASTERS CHOICE MCT6733	33.7	**28.8**	3,755	**37,879**	86	7.8	21	36	79	1.3	2.0
NK N78S-3111	31.0	24.9	3,489	30,357	81	8.0	25	42	75	2.7	1.0
NK N83D-3111	30.4	**29.8**	3,225	33,660	82	8.9	24	42	74	1.7	2.7
PIONEER P1637AM	31.6	26.2	3,198	29,273	80	8.0	29	44	72	1.7	0.7
PIONEER P2089VYHR	30.8	24.2	3,060	25,887	75	7.9	30	50	68	1.7	1.7
REV 25BHR26	36.5	**31.1**	3,589	**39,038**	86	8.2	20	34	80	1.7	1.7
REV 28BHR18	32.2	24.0	3,515	29,465	82	9.8	22	39	76	2.3	2.0
p value		0.00570		<.0001						ns	0.00630
LSD (0.10)		3.6		4,239						ns	0.9
Mason Averages	32.3	25.7	3,349	30,259	80	8.1	25	42	73	1.7	1.7

Percent dry matter (DM) represents the corn forage sample at harvest. Silage yields were adjusted to 35% DM; highest numerical yield is bold with gray box; bold yields are not significantly different from highest yield. Milk yield was calculated through Dairy One Forage Laboratories. Milk per ton was calculated from DM yields. Net energy for lactation (NEL). In vitro true digestibility (IVTD) estimates digestibility from anaerobic fermentation by incubating samples in rumen fluid. Quality measurements are based on dry weight and calculated from composite samples at each site. Higher crude protein (CP) and total digestible nutrients (TDN) values indicate better forage quality. Lower acid detergent fiber (ADF) and neutral detergent fiber (NDF) indicate better forage quality. Disease rates (GLS) and Rust (common and southern) were rated on a scale of 0 to 3, with 1 being at least one plant with expression of disease on any leaf and 3 being every plant in the plot expressing disease to the uppermost leaf.

Table 4. Mercer County, Kentucky

Hybrid	DM	Tons/A 35% DM	Milk Yield lb/T	Milk Yield lb/A	IVTD	CP	ADF	NDF	TDN	GLS	Rust
AGRIGOLD A645-10VT2RIB	37.5	20.2	3,075	21,736	77	6.2	25	45	71	1.0	1.0
AGRIGOLD A6544VT2RIB	35.0	19.7	3,279	22,609	79	5.9	24	43	73	1.0	1.0
AUGUSTA 1166VT2ProD	32.6	19.4	3,238	21,956	76	6.4	27	47	70	1.0	1.0
AUGUSTA 5465-3000GTD	32.9	16.0	3,379	18,899	79	6.1	26	45	73	1.0	1.0
BECKS 6365AM ™	31.3	17.2	3,530	21,214	81	6.2	22	40	74	1.0	1.0
BECKS 6886VR	32.1	19.8	3,541	24,552	81	6.5	24	43	75	1.0	1.0
BRODBECK 54SX15	33.9	21.2	3,521	26,081	81	6.0	20	38	75	1.0	1.0
BRODBECK 57SX15	30.8	16.5	3,331	19,185	78	6.6	27	46	72	1.0	1.0
CAVERNDALE CF 1039 VIP 3110	28.8	18.0	3,057	19,281	75	6.5	29	50	68	1.0	1.0
CAVERNDALE CF 888 3000GT	32.9	19.5	3,407	23,259	80	6.2	25	44	74	1.0	1.0
CHECK	30.3	17.5	2,745	16,843	71	6.0	32	55	63	1.0	1.0
DYNAGRO D55VC45	35.4	17.2	3,350	20,220	80	6.4	23	41	74	1.0	1.0
DYNAGRO D57VP75	32.0	20.4	3,411	24,395	79	6.0	25	45	73	1.0	1.0
MASTERS CHOICE MCT6363	35.0	16.6	3,212	18,606	78	5.7	23	42	72	1.0	1.0
MASTERS CHOICE MCT6733	33.8	19.5	3,597	24,559	82	6.2	21	38	76	1.0	1.0
NK N78S-3111	31.5	19.4	3,382	22,958	78	6.0	25	45	72	1.0	1.0
NK N83D-3111	27.7	17.6	3,485	21,527	80	7.3	25	45	75	1.0	1.0
PIONEER P1637AM	31.9	18.7	3,424	22,391	80	5.7	24	42	74	1.0	1.0
PIONEER P2089VYHR	34.6	15.7	3,502	19,299	82	5.7	24	40	76	1.0	1.0
REV 25BHR26	31.5	14.5	3,516	17,831	81	6.7	24	43	75	1.0	1.0
REV 28BHR18	34.0	15.7	3,425	18,865	80	6.3	23	42	74	1.0	1.0
p value		ns		ns							
LSD (0.10)		ns		ns						ns	ns
Mercer Averages	32.7	18.3	3,358	21,527	79	6.2	24	43	73	1.0	1.0

Percent dry matter (DM) represents the corn forage sample at harvest. Silage yields were adjusted to 35% DM; yields were not significantly different at this site. Milk yield was calculated through Dairy One Forage Laboratories. Milk per ton was calculated from DM yields. Net energy for lactation (NEL). In vitro true digestibility (IVTD) estimates digestibility from anaerobic fermentation by incubating samples in rumen fluid. Quality measurements are based on dry weight and calculated from composite samples at each site. Higher crude protein (CP) and total digestible nutrients (TDN) values indicate better forage quality. Lower acid detergent fiber (ADF) and neutral detergent fiber (NDF) indicate better forage quality. Disease rates (GLS) and Rust (common and southern) were rated on a scale of 0 to 3, with 1 being at least one plant with expression of disease on any leaf and 3 being every plant in the plot expressing disease to the uppermost leaf.

Table 5. Agronomic Practices

Management	Green	Mason	Mercer
Planting	5/18/2017	6/12/2017	5/30/2017
N, lb/A	185	248	161
P_2O_5, lb/A	10	0	0
K_2O, lb/A	80	22	30
Zn, lb/A	0	0	0
Lime, tons/A	0	0	0
Herbicide(s)	Roundup, Artrazine, Leadoff	Roundup, Atrazine, Charger	Roundup, Verdict, Atrazine, 2,4-D
Insecticide(s)	Capture	Capture	Capture
Fungicide(s)	Tri-Scan		
Soil Series	Mountview silt loam	Lowell-Sandview silt loam	Lowell silt loam
Previous Crop	wheat forage	wheat cover crop	wheat forage
Harvest	9/6/2017	10/2/2017	9/18/2017
Cooperator	Stacy Sidebottom	Ronnie Lowe	Zack Ison

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