

2016
University of Idaho Extension
Corn Variety Performance Trial

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Introduction

The 2016 corn variety trial was conducted by the University of Idaho Extension Jerome County faculty. The trial location was the University of Idaho Kimberly Research and Extension Center farm located near Kimberly, Idaho. Table 12 lists the entries for silage and Table 13 lists entries for grain. Silage hybrids ranged between 82-108 days relative maturity (RM). Grain hybrids ranged between 78-103 days RM.

Methods

The trial was a randomized complete block design with 4 replications. Silage varieties were split into 3 separate trails based on RM: 82-88, 90-98, and 100-108 to allow for harvest close to 32% dry matter for each variety. Individual plots were 4-30 inch rows x 22 feet. The center two rows were harvested for evaluation. Silage was evaluated for yield and quality. The silage corn population was approximately 40,000 plants per acre. Grain was evaluated for yield, moisture, and test weight. Population was approximately 36,000 plants per acre.

Silage Analysis

Silage quality analysis was determined by NIRS (Near Infrared Spectroscopy) analysis, and wet chemistry, on a composite sample of fresh silage by first combining a subsample from each individual varietal replication and then selecting a sample for analysis. The quality traits are:

1. CP= Crude protein. Higher protein levels indicate less need for more expensive supplements in the ration
2. TDN=Total Digestible Nutrients. The sum of the digestible protein, digestible non-fiber carbohydrates, digestible NDF and 2.25X the digestible fat.
3. ADF= Acid detergent fiber. A measure of the less digestible components in the forage. Lower is more desirable. Higher

ADF is generally related to more mature plants.

4. NDF= Neutral detergent fiber. A measure of the fiber content of the silage. Relates to intake level in livestock Lower is more desirable.
5. Starch= Starch. A measure of the energy portion of the silage. Higher is more desirable.
6. NDFD= Neutral Detergent Fiber Digestibility. The portion of the NDF potentially available for energy. Higher is more desirable.
7. NEL= Net energy for lactation. An energy measurement used in estimating amount of energy available for milk production. Higher is more desirable.

Agronomic Information

The field is located approximately 1½ miles northeast of Kimberly Idaho. Soils are Portneuf silt loam and Bahem silt loam. The farm is approximately 3880 feet in elevation. Irrigation is by furrow application. The trials were amended with 46-0-0 and P₂O₅ according the University of Idaho fertilizer guide for a 40 ton yield goal. Surpass was applied at the rate of 2 pts/acre pre plant incorporated. In mid-June 2,4-D was applied. No insecticides were used. The plots were planted May 4th with an Almaco Twin Plate 2 vacuum planter. Silage varieties were harvested with a John Deere 3970 two row forage harvester. Grain was harvested with a Wintersteiger Delta plot combine outfitted with a Grain Gauge electronic data recorder. Spider mite infestations were moderate in August. Aphid populations were quite heavy late in the season. Early maturing sweet corn was planted around the borders of the trial to reduce bird feeding damage, however some bird

feeding was evident in the earlier maturing varieties.

The 82-88 RM varieties were harvested September 16th. The 90-98 RM varieties were harvested September 21st. The 100-108 RM varieties were harvested September 30th. Grain varieties were harvested November 10th.

Results Notations

Silage samples were unprocessed and analyzed fresh. Results are shown on the dry matter basis. The varieties should not be ranked by milk lbs/ton based on NIR data in tables 2, 5 and 8 as quality results were not replicated. Milk/ton is based on unprocessed corn. Processed figures would be higher. The data should only be used for comparison purposes and individual variety potential. The wet chemistry data are in tables 3, 6, and 9 following the respective NIR data. As stated above, the quality results for silage were not replicated and thus no comparative statistics are shown. Many factors and management skills influence yield and quality of a given crop and these results are for comparison only. Actual production results will vary. All quality analysis was conducted by Northwest Labs, LLC. in Jerome, Idaho. Silage yield data is corrected to 32% dry matter and grain yield data is corrected to 15.5% moisture and 56 lbs test weight.

Yield results for silage varieties are shown broken into three maturity classes as well as all varieties listed together allowing the yield results to be analyzed within maturity class and as a whole since RM breaks between the three groups are arbitrary based on number of entries. In all yield analysis tables, varieties with the same letter for Test Means Separation indicate there is no significant difference in yield between those varieties.

Rain, high night and morning humidity, and lack of a hard freeze made final dry down

for grain varieties difficult. Planting corn varieties for grain with an RM greater than 99 days is not recommended in Idaho unless planning to harvest high moisture corn. Dry down for long season grain varieties can be difficult and lack of commercial drying facilities can push harvest dates well into winter. Had the 2016 study dried in the field to 15% moisture it would have been December or January before harvest was possible. As can be seen in Table 11, while not perfectly linear the longer RM varieties held higher moisture at harvest. Interestingly, the shortest RM corn variety was one of higher moisture at harvest.

Participating companies included Blue River Hybrids, Eureka Seeds, LLC., Foundation Direct Seeds, LLC., and Masters Choice.

Table 1. Yield results for 82-88 RM silage varieties.

Variety	Relative Maturity	Corrected Yield T/A (32% DM)	Test Means Separation-Yield
Masters Choice MCT 3891	88	39.3	A
Blue River Hybrids 27B16	88	38.3	A B
Foundation Direct Seeds HDS 85	85	36.9	A B C
Blue River Hybrids 21L90	85	35.6	A B C
Foundation Direct Seeds HDS 86	86	35.0	B C
Masters Choice MCT 3220	82	34.4	C
Mean		36.6	
LSD (.05)		3.7	
CV%		6.7	

Table 2. Quality results for 82-88 RM silage varieties (NIR).

Treatment	Relative Maturity	Harvest Moisture %	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	48 HR dNDF	48 HR NDFD	NEL Mcal/lb	Milk lbs/ton DM
Masters Choice MCT 3891	88	65	7.5	23.6	69.9	24.8	43.7	31.1	71.1	.73	3561
Blue River Hybrids 27B16	88	70	7.0	26.4	71.8	22.6	39.7	26.4	68.6	.76	3660
Foundation Direct Seeds HDS 85	85	69	6.8	30.2	73.1	21.1	37.6	30.2	67.1	.78	3765
Blue River Hybrids 21L90	85	67	7.8	19.8	69.1	25.7	44.5	30.6	68.8	.71	3484
Foundation Direct Seeds HDS 86	86	72	7.4	17.4	69.0	26.0	44.7	30.7	68.8	.71	3294
Masters Choice MCT 3220	82	66	7.3	26.6	70.5	24.1	42.0	30.9	73.7	.74	3766

Quality results not replicated.

Table 3. Quality results for 82-88 RM silage varieties (Wet Chemistry).

Treatment	Relative Maturity	Harvest Moisture %	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	NEL Mcal/lb
Masters Choice MCT 3891	88	65	7.4	28.5	69.1	25.8	43.3	.71
Blue River Hybrids 27B16	88	70	6.9	31.1	70.9	23.6	39.2	.74
Foundation Direct Seeds HDS 85	85	69	7.2	31.9	71.5	22.9	39.1	.76
Blue River Hybrids 21L90	85	67	8.0	23.3	68.0	27.0	45.5	.69
Foundation Direct Seeds HDS 86	86	72	6.9	19.3	67.2	28.0	49.4	.67
Masters Choice MCT 3220	82	66	7.2	26.1	67.3	27.9	47.2	.68

Table 4. Yield results for 90-98 RM silage varieties.

Variety	Relative Maturity	Corrected Yield T/A (32% DM)	Test Means Separation-Yield
Eureka 5467 STX	98	44.4	A
Blue River Hybrids 33A16	93	42.9	A B
Masters Choice MCT 4211	92	42.6	A B C
Eureka 5470 STX	98	42.2	A B C
Blue River Hybrids 43L96	98	41.7	A B C D
Eureka 5410 VT2	91	40.9	A B C D
Masters Choice MCT 4572	95	40.4	B C D
Eureka 5467 STX	97	40.0	B C D
Masters Choice MCT 4632	96	39.7	B C D
Eureka 5415 VT2	93	39.4	B C D
Foundation Direct Seeds HDS 95	95	39.1	C D
Foundation Direct Seeds HDS 90	90	38.5	D
Mean		40.9	
LSD (.05)		3.6	
CV%		6.1	

Table 5. Quality results for 90-98 RM silage varieties (NIR).

Treatment	Relative Maturity	Harvest Moisture %	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	48 HR dNDF	48 HR NDFD	NEL Mcal/lb	Milk lbs/ton DM
Eureka 5467 STX	98	67	7.1	33.4	74.4	19.5	35.1	24.5	69.7	.81	3715
Blue River Hybrids 33A16	93	68	7.4	32.0	72.9	21.3	36.4	24.8	68.1	.78	3910
Masters Choice MCT 4211	92	64	7.4	37.5	75.2	18.6	34.2	23.9	69.9	.82	3818
Eureka 5470 STX	98	69	7.5	29.9	72.5	21.8	38.7	27.2	70.3	.77	3954
Blue River Hybrids 43L96	98	68	7.0	21.9	69.7	25.1	43.5	30.4	69.8	.72	3572
Eureka 5410 VT2	91	67	7.1	29.1	71.8	22.6	39.8	27.6	69.4	.76	3896
Masters Choice MCT 4572	95	67	7.4	31.2	74.2	19.8	37.0	26.1	70.6	.81	3967
Eureka 5467 STX	97	64	7.5	40.3	76.8	16.7	31.2	22.7	72.8	.85	3947
Masters Choice MCT 4632	96	66	7.4	33.9	74.0	20.1	36.3	24.8	68.4	.80	3747
Eureka 5415 VT2	93	98	7.4	30.2	72.5	21.8	39.0	27.1	69.6	.77	3961
Foundation Direct Seeds HDS 95	95	71	7.1	23.3	71.7	22.7	40.9	26.8	65.5	.76	3393
Foundation Direct Seeds HDS 90	90	69	7.4	21.6	68.8	26.1	44.6	31.0	69.6	.70	3623

Quality results not replicated.

Table 6. Quality results for 90-98 RM silage varieties (**Wet Chemistry**).

Treatment	Relative Maturity	Harvest Moisture %	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	NEL Mcal/lb
Eureka 5467 STX	98	67	6.9	37.6	73.0	21.2	34.7	.78
Blue River Hybrids 33A16	93	68	6.9	29.8	68.8	26.1	40.4	.70
Masters Choice MCT 4211	92	64	7.1	32.8	70.5	24.1	39.4	.74
Eureka 5470 STX	98	69	6.7	28.6	68.9	26.0	43.1	.71
Blue River Hybrids 43L96	98	68	6.8	23.7	67.0	28.2	45.8	.67
Eureka 5410 VT2	91	67	6.9	27.9	68.5	26.4	42.3	.70
Masters Choice MCT 4572	95	67	7.2	30.3	70.0	24.7	40.0	.73
Eureka 5467 STX	97	64	6.7	31.9	70.4	24.2	39.9	.73
Masters Choice MCT 4632	96	66	7.3	36.7	70.5	24.1	38.4	.74
Eureka 5415 VT2	93	98	7.1	29.5	68.9	26.0	41.1	.71
Foundation Direct Seeds HDS 95	95	71	7.0	32.8	69.0	25.9	42.1	.71
Foundation Direct Seeds HDS 90	90	69	7.3	25.6	68.3	26.7	42.2	.69

Table 7. Yield results for 100-108 RM silage varieties.

Variety	Relative Maturity	Corrected Yield T/A (32% DM)	Test Means Separation-Yield
Foundation Direct Seeds HDS 100	100	46.6	A
Blue River Hybrids 49K70	102	43.6	A B
Eureka 5499 VT2	100	43.3	A B
Eureka 5565 STX	108	43.2	A B
Blue River Hybrids 53L96	104	41.9	B
Blue River Hybrids 57A30	107	41.2	B C
Eureka 5507 VT2	103	40.9	B C
Masters Choice MCT 5375	103	40.3	B C D
Foundation Direct Seed HDS Goliath	110	37.7	C D
Eureka 5520 VT2	105	36.9	D
Mean		41.5	
LSD (.05)		3.9	
CV%		6.4	

Table 8. Quality results for 100-108 RM silage varieties (NIR).

Treatment	Relative Maturity	Harvest Moisture %	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	48 HR dNDF	48 HR NDFD	NEL Mcal/lb	Milk lbs/ton DM
Foundation Direct Seeds HDS 100	100	68	7.2	32.6	71.0	23.5	39.6	25.3	63.8	.75	3901
Blue River Hybrids 49K70	102	67	7.3	30.9	69.5	25.3	42.0	27.7	65.9	.72	3920
Eureka 5499 VT2	100	67	7.2	29.0	69.1	25.7	43.0	27.5	63.8	.71	3816
Eureka 5565 STX	108	69	7.1	26.4	68.2	26.8	44.6	29.3	65.6	.69	3793
Blue River Hybrids 53L96	104	70	6.7	19.9	65.3	30.2	49.3	31.4	63.8	.64	3443
Blue River Hybrids 57A30	107	71	6.9	23.9	67.5	27.6	45.9	28.8	62.8	.68	3548
Eureka 5507 VT2	103	65	6.9	26.2	68.6	26.3	44.2	28.8	65.1	.70	3483
Masters Choice MCT 5375	103	69	6.4	20.5	65.8	29.6	48.3	29.1	60.2	.65	3270
Foundation Direct Seed HDS Goliath	110	74	6.7	14.5	61.4	34.8	54.7	31.2	57.1	.57	2988
Eureka 5520 VT2	105	67	7.2	28.1	69.3	25.5	42.5	27.0	63.4	.71	3516

Quality results not replicated.

Table 9. Quality results for 100-108 RM silage varieties (Wet Chemistry).

Treatment	Relative Maturity	Harvest Moisture %	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	NEL Mcal/lb
Foundation Direct Seeds HDS 100	100	68	7.5	33.3	70.0	24.7	40.3	.73
Blue River Hybrids 49K70	102	67	6.8	30.3	68.9	26.0	41.5	.71
Eureka 5499 VT2	100	67	6.3	28.8	69.3	25.5	43.5	.71
Eureka 5565 STX	108	69	6.4	29.0	67.8	27.3	42.8	.69
Blue River Hybrids 53L96	104	70	6.6	21.7	64.8	30.8	49.0	.63
Blue River Hybrids 57A30	107	71	6.5	27.9	66.4	28.9	44.3	.66
Eureka 5507 VT2	103	65	6.2	27.9	67.3	27.9	45.4	.68
Masters Choice MCT 5375	103	69	6.4	23.5	64.6	31.0	47.4	.63
Foundation Direct Seed HDS Goliath	110	74	7.3	19.2	58.5	38.2	51.2	.51
Eureka 5520 VT2	105	67	7.1	27.8	68.4	26.6	41.8	.70

Table 10. Yield results for all silage varieties.

Variety	Relative Maturity	Corrected Yield T/A (32% DM)	Test Means Separation-Yield
Foundation Direct Seeds HDS 100	100	46.5	A
Eureka 5474 VT2	98	44.4	A B
Blue River Hybrids 49K70	102	43.6	A B C
Eureka 5499 VT2	100	43.2	A B C D
Eureka 5565 STX	108	43.2	A B C D
Blue River Hybrids 33A16	93	42.9	A B C D E
Masters Choice MCT 4211	92	42.6	B C D E F
Eureka 5470 STX	98	42.2	B C D E F
Blue River Hybrids 53L96	104	41.9	B C D E F G
Blue River Hybrids 43L96	98	41.7	B C D E F G
Blue River Hybrids 57A30	107	41.2	B C D E F G H
Eureka 5410 VT2	91	40.9	B C D E F G H
Eureka 5507 VT2	103	40.9	B C D E F G H
Masters Choice MCT 4572	95	40.4	C D E F G H I
Masters Choice MCT 5375	103	40.3	C D E F G H I
Eureka 5467 STX	97	40.0	C D E F G H I
Masters Choice MCT 4632	96	39.7	D E F G H I
Eureka 5415 VT2	93	39.4	E F G H I J
Masters Choice MCT 3891	88	39.3	E F G H I J
Foundation Direct Seeds HDS 95	95	39.1	F G H I J
Foundation Direct Seeds HDS 90	90	38.5	G H I J K
Blue River Hybrids 27B16	88	38.3	G H I J K
Foundation Direct Seeds "Goliath"	110	37.7	H I J K L
Eureka 5520 VT2	105	36.9	I J K L
Foundation Direct Seeds HDS 85	85	36.9	I J K L
Blue River Hybrids 21L90	85	35.6	J K L
Foundation Direct Seeds HDS 86	86	35.0	K L
Masters Choice MCT 3220	82	34.4	L
Mean		40.2	
LSD (.05)		3.7	
CV%		6.6	

Table 11. Grain corn variety results.

Variety	Relative Maturity	Moisture as harvested (%)	Corrected Yield bu/A*	Test Means Separation- Yield
Eureka 5474 VT2	98	22	285	A
Foundation Direct Seeds HDS 8789	95	20	249	B
Blue River Hybrids 27B16	88	20	247	B
Eureka 5415 VT2	93	20	246	B
Masters Choice MCT 3220	82	17	242	B
Eureka 5467 STX	97	23	242	B
Eureka 5410 VT2	91	20	234	B C
Masters Choice MCT 3891	88	18	227	B C D
Eureka 5507 VT2	103	28	227	B C D
Eureka 5499 VT2	100	26	226	B C D
Eureka 5470 STX	98	25	223	B C D
Master Choice MCT 4572	95	20	222	B C D
Blue River Hybrids 40R73	97	25	218	B C D E
Masters Choice MCT 4054	90	20	218	B C D E
Eureka 5375 VT2	87	18	216	B C D E
Blue River Hybrids 27B50	88	19	206	C D E F
Blue River Hybrids 43T35	98	27	205	C D E F
Foundation Direct Seeds 8585	101	26	205	C D E F
Masters Choice MCT 4211	92	19	204	C D E F
Foundation Direct Seeds 8762	78	24	200	C D E F
Blue River Hybrids 33A16	93	22	193	D E F
Foundation Direct Seeds Organic 8700	97	28	185	E F
Blue River Hybrids 37K90	95	24	177	F
Mean		221.5		
LSD (.05)		34.5		
CV%		11.0		

* Grain yield data has been corrected to 15.5% moisture and 56 lb test wt.

Table 12. Index of silage varieties.

Variety	RM
Masters Choice MCT 3220	82
Foundation Direct Seeds HDS 85	85
Blue River Hybrids 21L90	85
Foundation Direct Seeds HDS 86	86
Masters Choice MCT 3891	88
Blue River Hybrids 27B16	88
Foundation Direct Seeds HDS 90	90
Eureka 5410 VT2	91
Masters Choice MCT 4211	92
Blue River Hybrids 33A16	93
Eureka 5415 VT2	93
Masters Choice MCT 4572	95
Foundation Direct Seeds HDS 95	95
Masters Choice MCT 4632	96
Eureka 5467 STX	97
Eureka 5474 VT2	98
Eureka 5470 STX	98
Blue River Hybrids 43L96	98
Foundation Direct Seeds HDS 100	100
Eureka 5499 VT2	100
Blue River Hybrids 49K70	102
Eureka 5507 VT2	103
Masters Choice MCT 5375	103
Blue River Hybrids 53L96	104
Eureka 5520 VT2	105
Blue River Hybrids 57A30	107
Eureka 5565 STX	108
Foundation Direct Seeds "Goliath"	110

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Variety	RM
Foundation Direct Seeds 8762	78
Masters Choice MCT 3220	82
Eureka 5375 VT2	87
Blue River Hybrids 27B16	88
Masters Choice MCT 3891	88
Blue River Hybrids 27B50	88
Masters Choice MCT 4054	90
Eureka 5410 VT2	91
Masters Choice MCT 4211	92
Eureka 5415 VT2	93
Blue River Hybrids 33A16	93
Foundation Direct Seeds HDS 8789	95
Master Choice MCT 4572	95
Blue River Hybrids 37K90	95
Eureka 5467 STX	97
Blue River Hybrids 40R73	97
Foundation Direct Seeds Organic 8700	97
Eureka 5474 VT2	98
Eureka 5470 STX	98
Blue River Hybrids 43T35	98
Eureka 5499 VT2	100
Foundation Direct Seeds 8585	101
Eureka 5507 VT2	103

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To enrich education through diversity the University of Idaho is an equal opportunity/affirmative action employer and educational institution. University of Idaho and U.S. Department of Agriculture Cooperating.

Table 13. Index of grain varieties.

University of Idaho Extension 2016 Corn Variety Trials.