

# UNIVERSITY OF IDAHO TWIN FALLS COUNTY 2013 SILAGE CORN VARIETY TRIALS

Steven L. Hines<sup>1</sup>

## ABSTRACT

Idaho is ranked 3rd in the nation for milk production and 4<sup>th</sup> in number of dairy cows. As the Idaho dairy industry has grown, acres of corn produced for silage have increased as well. In 1989, Idaho producers planted 78,000 acres for silage production. In 2013, Idaho producers planted approximately 225,000 acres of corn for silage. Idaho ranks 6<sup>th</sup> in the U.S. for tons of corn silage produced. In 2008, a corn grain variety trial program was started through the University of Idaho Twin Falls County Extension office, and in 2009 the program was expanded to include silage varieties. The data from these trials can be combined with industry data to help producers choose the best corn varieties for their growing conditions and management objectives.

**Keywords:** Corn, silage, variety trials, yield, quality

## INTRODUCTION

The 2013 corn variety trial was conducted by the University of Idaho Jerome County Extension office. The trial location was the University of Idaho Kimberly Research and Extension Center farm located near Kimberly, Idaho. Table 11 lists the entries for silage and Table 12 lists entries for grain. Hybrids ranged between 82-108 days relative maturity (RM).

## METHODS

The trial was a randomized complete block design with 4 replications. Silage varieties were split into 3 separate trails based on RM: 82-91, 92-99, and 101-108. Individual plots were 4-30 inch rows x 20 feet. The center two rows were harvested for evaluation. Silage was evaluated for yield and quality. The silage corn population was approximately 38,000 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 Spectral) 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. IVTD 24 hr = In vitro digestible dry matter. A measure of digestibility at 24 hours in the rumen. Higher digestibility is more desirable
2. CP= Crude protein. Higher protein levels indicate less need for more expensive supplements in the ration.
3. TDN=Total Digestible Nutrients. The sum of the digestible protein, digestible non-fiber carbohydrates, digestible NDF and 2.25X the digestible fat.

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<sup>1</sup> S. Hines, Univ. of Idaho Jerome County Extension, 600 2<sup>nd</sup> Ave. W, Jerome, ID 83338 [shines@uidaho.edu](mailto:shines@uidaho.edu).

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4. ADF= Acid detergent fiber. A measure of the less digestible components in the forage. Lower ADF is more desirable. Higher ADF is generally related to more mature plants.
5. NDF= Neutral detergent fiber. A measure of the fiber content of the silage. Relates to feed intake level in livestock. Lower NDF is more desirable.
6. Starch= Starch. A measure of the energy portion of the silage. Higher starch is more desirable.
7. NFC=Non-fiber carbohydrates. Non-cell wall carbohydrates consisting of starch, sugar, pectin and fermentation acids that serve as energy sources for the animal. Higher NFC is better.
8. NEL= Net energy for lactation. An energy measurement used in estimating amount of energy available for milk production. Higher NEL is more desirable.

### **Agronomic Information**

The field is located approximately 1 ½ miles north east 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 to achieve 340 lbs N, according the University of Idaho fertilizer guide for a 40 ton yield goal. No additional phosphorus or potassium was added. Surpass was applied at the rate of 2 pts/acre pre plant incorporated. No additional herbicides were used in the trials. No insecticides were used. The plots were planted May 9<sup>th</sup> with an Almaco Twin Plate 2 vacuum planter. Silage varieties were harvested with a John Deere #35 two row forage harvester. Grain was harvested with a Wintersteiger plot combine outfitted with a Grain Gauge electronic data recorder. Spider mite infestations were moderate in August. Very few western corn root worm adults, *Diabrotica virgifera virgifera*, were observed. Early maturing sweet corn was planted around the borders of the trial to reduce bird feeding damage. The summer of 2013 was above average temperatures and base 50 Growing Degree Days were well above average. Heat stress was evident by poor pollination at ear tips. The 82-91 RM varieties were harvested September 9<sup>th</sup>. The 92-99 RM varieties were harvested September 13<sup>th</sup>. The 101-108 RM varieties were harvested September 18<sup>th</sup>. Grain varieties were harvested November 4<sup>th</sup>.

### **RESULTS NOTATIONS**

Silage samples were unprocessed and analyzed fresh. 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. 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 CRI AgSource in Jerome, Idaho. Grain yield data has been corrected to 15.5% moisture and 56 lbs test weight.

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. Complete results can be viewed at the University of Idaho Jerome County Extension web site.

## Results

**Table 1.** Yield results for 82-91 RM silage varieties.

Variety	Corrected Yield T/A (32% DM)	Test Means Separation-Yield
Eur 7161	33.4	A
Eur 3029	31.4	A B
FOS HDS 90	31.0	A B
MC 3221	30.8	A B
Eur 3027	30.8	A B
FOS HDS 85	30.3	A B
Eur 3028	29.0	B
MC 4050	28.3	B
Mean	30.6	
LSD (.05)	3.9	
CV%	8.61	

**Table 2.** Quality results for 82-91 RM silage varieties (NIR).

Treatment	DM Corrected Yield 32%	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	48 HR dNDF	48 HR NDFD	NEL Mcal/lb	Milk lbs/ton DM
Eur 7161	33.4	6.5	43.0	75.3	18.4	32.3	21.4	66.4	.83	3725
Eur 3029	31.4	6.8	35.9	72.5	21.7	37.4	24.1	64.5	.77	3629
FOS HDS 90	31.0	6.8	35.9	72.0	22.3	36.6	24.6	67.2	.77	4097
MC 3221	30.8	6.8	34.7	70.8	23.8	38.8	25.1	64.7	.74	3617
Eur 3027	30.8	7.0	39.0	73.7	20.3	32.0	20.6	64.3	.80	3736
FOS HDS 85	30.3	6.6	36.0	72.1	22.2	35.6	21.3	59.9	.77	3837
Eur 3028	29.0	7.0	32.9	70.8	23.8	38.3	26.5	69.1	.74	4077
MC 4050	28.3	6.7	37.9	73.6	20.4	32.7	21.6	65.9	.80	4041

**Table 3.** Quality results for 82-91 RM silage varieties (Wet Chemistry).

Treatment	DM Corrected Yield 32%	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	NEL Mcal/lb	Milk lbs/ton DM
Eur 7161	33.4	5.6	40.7	74.8	19.0	33.9	.82	3725
Eur 3029	31.4	5.7	34.9	72.7	21.5	38.0	.78	3629
FOS HDS 90	31.0	5.6	34.5	73.0	21.2	37.1	.78	4097
MC 3221	30.8	5.6	30.1	71.5	22.9	39.3	.76	3617
Eur 3027	30.8	6.0	35.0	74.8	19.1	32.6	.82	3736
FOS HS 85	30.3	5.4	32.3	72.6	21.6	36.9	.78	3837
Eur 3028	29.0	5.5	33.7	72.0	22.3	38.9	.77	4077
MC 4050	28.3	6.2	37.5	74.5	19.4	33.8	.81	4041

**Table 4.** Yield results for 92-99 RM silage varieties.

Variety	Corrected Yield T/A (32% DM)	Test Means Separation-Yield
Eur 2048	34.0	A
FOS HDS 95	31.3	A B
Eur 7227	31.3	A B
Eur 7190	30.3	B C
Eur 2024	28.0	B C
MC 4590	27.0	C
Mean	30.3	
LSD (.05)	3.7	
CV%	8.1	

**Table 5.** Quality results for 92-99 RM silage varieties (NIR).

Treatment	DM Corrected Yield 32%	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	48 HR dNDF	48 HR NDFD	NEL Mcal/lb	Milk lbs/ton DM
Eur 2048	34.0	6.3	33.7	70.8	23.7	38.3	22.9	59.7	.74	3762
FOS HDS 95	31.3	5.8	32.2	71.9	22.4	33.2	23.1	69.6	.76	3715
Eur 7227	31.3	6.5	34.5	71.9	22.5	36.9	23.4	63.4	.76	3899
Eur 7190	30.3	6.1	33.9	71.2	23.3	37.1	22.8	61.3	.75	3766
Eur 2024	28.0	6.7	32.2	70.8	23.8	40.8	24.8	60.9	.74	3767
MC 4590	27.0	6.7	27.9	68.5	26.4	41.5	28.7	69.0	.70	3854

**Table 6.** Quality results for 92-99 RM silage varieties (Wet Chemistry).

Treatment	DM Corrected Yield 32%	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	NEL Mcal/lb	Milk lbs/ton DM
Eur 2048	34.0	5.7	32.6	70.9	23.6	39.3	.74	3762
FOS HDS 95	31.3	6.2	32.6	72.2	22.1	37.9	.77	3715
Eur 7227	31.3	5.5	33.2	71.0	23.5	38.3	.75	3899
Eur 7190	30.3	5.6	32.4	70.6	24.0	38.7	.74	3766
Eur 2024	28.0	5.3	29.2	69.7	25.0	42.4	.72	3767
MC 4590	27.0	5.4	27.0	69.1	25.7	42.9	.71	3854

**Table 7.** Yield results for 101-108 RM silage varieties.

Variety	Corrected Yield T/A (32% DM)	Test Means Separation-Yield
Eur 2027	39.3	A
Eur 2026	34.5	A
Eur 3026	34.0	A B
FOS Pure Maize	28.8	B
Mean	34.1	
LSD (.05)	5.8	
CV%	10.5	

**Table 8.** Quality results for 101-108 RM silage varieties (NIR).

Treatment	DM Corrected Yield 32%	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	48 HR dNDF	48 HR NDFD	NEL Mcal/lb	Milk lbs/ton DM
Eur 2027	39.3	6.7	36.6	72.1	22.2	34.8	21.3	61.1	.77	3892
Eur 2026	34.5	6.7	31.7	69.8	24.9	39.8	26.6	66.9	.72	3966
Eur 3026	34.0	6.7	39.2	72.8	21.4	34.3	20.9	61.0	.78	3585
FOS Pure Maize	28.8	6.1	23.8	67.1	28.1	45.7	29.0	63.5	.67	3507

**Table 9.** Quality results for 101-108 RM silage varieties (Wet Chemistry).

Treatment	DM Corrected Yield 32%	Crude Protein % DM	Starch % DM	TDN %DM	ADF %DM	aNDF %DM	NEL Mcal/lb	Milk lbs/ton DM
Eur 2027	39.3	5.9	34.6	73.0	21.2	36.1	.78	3892
Eur 2026	34.5	5.8	29.4	71.0	23.5	40.6	.75	3966
Eur 3026	34.0	6.2	35.1	74.3	19.6	35.4	.81	3585
FOS Pure Maize	28.8	5.5	24.7	68.2	26.8	44.6	.69	3507

**Table 10.** Grain corn variety results.

Variety	% Moisture	Test Weight	Corrected Yield bu/A*	Test Means Separation-Yield
Eur 2048	15.4	51.4	275	A
Eur 2024	16.1	53.5	262	A B
Eur 2025	16.7	53.6	252	A B C
Eur 7190	14.9	51.6	242	A B C D
Eur 3026	16.8	54.2	241	A B C D

<b>Eur 3028</b>	14.9	53.9	226	B C D E
<b>Eur 3027</b>	15.0	52.4	224	B C D E
<b>Eur 2042</b>	15.8	51.6	209	C D E
<b>Eur 3029</b>	13.3	49.4	209	C D E
<b>Eur 7227</b>	16.8	55.2	200	D E
<b>Eur 3030</b>	13.3	54.2	200	D E
<b>Eur 7161</b>	15.0	54.3	182	E
<b>Mean</b>	15.3	53.0	227	
<b>LSD (.05)</b>	1.0	4.4	45.6	
<b>CV%</b>	4.4	5.8	14.0	

**Table 11.** Index of silage varieties.

<b>Variety*</b>	<b>RM</b>
MC 3221	82
Eur 7161	85
Eur 3029	85
Eur 3028	87
FOS HDS 85	88
FOS HDS 90	90
MC 4050	90
Eur 3027	91
Eur 7190	92
Eur 2048	95
MC 4590	95
Eur 2048	95
FOS HDS 95	97
Eur 2024	97
FOS HDS 95	97
Eur 7227	99
Eur 7227	99
Eur 3026	101
Eur 2026	107
FOS Pure Maize	107
Eur 2027	108

**Table 12.** Index of grain varieties.

<b>Variety*</b>	<b>RM</b>
Eur 3030	80
Eur 3029	85
Eur 7161	85
Eur 3028	87
Eur 3027	91
Eur 7190	92
Eur 2048	95
Eur 2048	95
Eur 2042	96
Eur 2024	97
Eur 2024	97
Eur 7227	99
Eur 2025	101
Eur 3026	101
Eur 2025	101

\*

Eur-Eureka Seed  
FOS-Foundation Organic Seeds, LLC.  
MC-Masters Choice

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# UNIVERSITY OF IDAHO EXTENSION 2011 SILAGE VARIETY TRIALS

Steven L. Hines<sup>1</sup>

## ABSTRACT

In 2011, Idaho producers planted approximately 225,000 acres of corn for silage. In 2009, a corn silage variety trial program was started through the University of Idaho Twin Falls County Extension office. 2011 was the third year of the silage trial program. The data from these trails can be combined with industry data to help producers choose the best corn varieties for their growing conditions and management objectives. The full trial report can be found on the University of Idaho Twin Falls County Extension website.

**Keywords:** Corn, silage, variety trials, yield, quality

## INTRODUCTION

The 2011 corn variety trial was conducted by the University of Idaho Twin Falls County Extension office. The trial location was the University of Idaho Kimberly Research and Extension Center farm located near Kimberly, Idaho. Table 10 lists the silage varieties. Hybrids ranged between 79-109 days relative maturity (RM).

## METHODS

The trial was a randomized complete block design with 4 replications. Silage varieties were split into 3 separate trails based on RM (79-90, 92-100, and 102-109). Individual plots for silage were 4-30" rows x 20' in length. The center two rows were harvested and evaluated for yield and quality.

### Silage Analysis

Silage quality analysis was determined by NIRS (Near Infrared Spectral) 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. IVTD 24 hr= In vitro digestible dry matter. A measure of digestibility at 24 hrs in the rumen. Higher value is more desirable
2. CP= Crude protein. Higher protein levels indicate less need for more expensive supplements in the ration
3. TDN=Total Digestible Nutrients. The sum of the digestible protein, digestible non-fiber carbohydrates, digestible NDF and 2.25X the digestible fat.
4. ADF= Acid detergent fiber. As measure of the less digestible components in the forage. Lower is more desirable. Higher ADF values are generally related to more mature plants.
5. NDF= Neutral detergent fiber. A measure of the fiber content of the silage. Relates to intake level in livestock. Lower values are more desirable.
6. Starch= Starch. A measure of the energy portion of the silage. Higher is more desirable.
7. NFC=Non-fiber carbohydrates. Non-cell wall carbohydrates consisting of starch, sugar, pectin and fermentation acids that serve as energy sources for the animal.
8. NEL= Net energy for lactation. An energy measurement used in estimating amount of energy available for milk production. Higher is more desirable.

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<sup>1</sup> S. Hines, Extension Educator, University of Idaho, Twin Falls County Extension, 246 3rd Ave E., Twin Falls, ID 83301. Presented at the Idaho Alfalfa and Forage Conference, 1-2 March, 2012.

### Agronomic Information

The field is located approximately 1 ½ miles north east 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 followed a sorgum-sudan grass green manure crop. The trials were amended with 450 lbs/acre 46-0-0. No additional phosphorus or potassium was added. Surpass was applied at the rate of 2 pts/acre pre plant incorporated. No additional herbicides were used in the trials. No insecticides were used. The plots were planted May 13<sup>th</sup> with an Almaco Twin Plate 2 vacuum planter. Silage varieties were harvested with a John Deere #35 two row forage harvester and weighed. Spider mite infestations became heavy in August. Late in the season aphids were very evident across the trials. Very few western corn root worm adults, *Diabrotica virgifera virgifera*, were observed. Black bird feeding was severe on the 79 and 85 day RM varieties. That feeding damage is evident in the quality results in the silage starch. Early maturing sweet corn was planted around the borders of the trial. The sweet corn attracted much of the feeding away from the trials and bird damage was less severe than in previous years. The summer of 2011 started off cool and corn throughout the region was two to three weeks behind the normal growth schedule. The month of May was well below the 10 year average of base 50 growing degree days (GDD's). June was slightly below normal but the months of July -September were hot and above the average for GDD's. The 79-90 and 92-100 day RM plots were harvested September 29<sup>th</sup> and accumulated 2033 growing degree days (GDD), base 50. The remaining silage plots, 102-107 RM, were harvested on October 4<sup>th</sup> and accumulated 2122 GDDs.

### RESULTS

Silage samples were analyzed fresh. Starch and In vitro 24 hr digestibility was not available on the wet chemistry standard test and values are not given for those in the tables below. The varieties are ranked by milk lbs/acre based on NIRS data in tables 2, 5 and 8. The wet chemistry data is in the tables 3, 6, and 9 following the respective NIRS data. The quality results for silage were not replicated and thus no comparative statistics are shown for quality. Many factors influence yield and quality of a given crop and these results are given for comparison only. Actual production results will vary. NIRS analysis was completed by GHC Consulting of Filer, ID and wet chemistry analysis was completed by CVA Analytical, Maugansville, MD.

**Table 1.** Yield results for 79-90 RM silage varieties.

Variety	Corrected Yield T/A (32% DM)	Stand Density	Test Means Separation- Yield
<b>MC 4050</b>	37.7	35991	A
<b>FDS HDS 90-22</b>	29.8	31789	B
<b>FDS HDS 85-30</b>	29.1	25538	B
<b>Eur X1058</b>	27.4	29956	B
<b>Eur X1098</b>	26.6	33621	B
<b>Mean</b>	30.1	31,379	
<b>LSD (.05)</b>	6.2	6180	
<b>CV%</b>	13.3	12.8	

**Table 2.** Quality results for 79-90 RM silage varieties (NIR).

Treatment	Moisture Corrected Yield 32%	Crude Protein % DM	TDN %DM	ADF %DM	NDF %DM	Starch % DM	Non Fiber CHO % DM	NEL Mcal/lb	Milk lbs/acre
MC 4050	38	6.8	67.0	24.0	40.8	36.4	46.0	0.70	45695
FDS HDS 85-30	29	8.0	69.0	21.9	35.9	35.6	48.1	0.73	35208
FDS HDS 90-22	30	8.6	66.0	24.5	42.4	25.6	44.5	0.74	34214
Eur 1098	27	7.4	64.0	26.9	43.1	27.0	41.3	0.65	28619
Eur 1058	27	7.4	59.0	26.5	41.7	24.2	44.0	0.61	28567

Quality results not replicated. Only ranked by milk lbs/acre

**Table 3.** Quality results for 79-90 RM silage varieties (Wet Chemistry).

Treatment	Relative Maturity	Harvest Moisture %	Moisture Corrected Yield 32%	Crude Protein % DM	TDN %DM	ADF %DM	NDF %DM	Non Fiber CHO % DM	NEL Mcal/lb
MC 4050	90	63	38	6.3	70.8	23.9	38.3	47.1	0.74
FDS HDS 85-30	85	67	29	7.0	71.4	23.0	34.3	50.4	0.74
FDS HDS 90-22	90	68	30	5.8	69.0	25.1	38.9	46.2	0.72
Eur 1098	79	67	27	7.1	67.4	25.3	40.5	42.3	0.70
Eur 1058	85	64	27	6.9	68.0	25.0	41.3	42.8	0.71

**Table 4.** Yield results for 92-100 RM silage varieties.

Variety	Corrected Yield T/A (32% DM)	Stand Density	Test Means Separation-Yield
Eur X1031	29.3	32974	A
MC 4280	29.1	33513	A
MC 4560	28.3	29525	A
Eur ES 7201	26.8	31681	A
DL Stealth 3195Q	25.2	32112	A B
FDS HDS 95-90*	18.5	14655	B
Mean	26.2	29077	
LSD (.05)	7.2	4973	
CV%	18.2	11.4	

\*organic variety w/ no seed treatments

**Table 5.** Quality results for 92-100 RM silage varieties (NIR).

Treatment	Moisture Corrected Yield 32%	Crude Protein % DM	TDN %DM	ADF %DM	NDF %DM	Starch % DM	Non Fiber CHO % DM	NEL Mcal/lb	Milk lbs/acre
<b>Eur X1031</b>	29	7.7	70.0	24.7	41.6	31.7	44.4	0.72	33510
<b>MC 4280</b>	29	7.3	64.0	24.8	40.4	27.9	44.6	0.67	32280
<b>MC 4560</b>	28	7.5	65.0	24.4	40.7	28.3	45.0	0.67	31000
<b>DL Stealth 3195Q</b>	25	6.9	68.0	26.1	44.1	29.5	42.8	0.70	29015
<b>Eur ES 7201</b>	27	7.3	62.0	26.7	42.5	25.1	43.7	0.64	25637
<b>FDS HD 95-90</b>	19	7.7	68.0	23.3	38.8	30.4	47.2	0.72	21171

Quality results not replicated. Only ranked by milk lbs/acre

**Table 6.** Quality results for 92-100 RM silage varieties (Wet Chemistry).

Treatment	Relative Maturity	Harvest Moisture %	Moisture Corrected Yield 32%	Crude Protein % DM	TDN %DM	ADF %DM	NDF %DM	Non Fiber CHO % DM	NEL Mcal/lb
<b>Eur X1031</b>	99	68	29	6.3	70.2	25.3	39.4	46.4	0.73
<b>MC 4280</b>	92	67	29	6.4	70.4	25.1	39.0	46.2	0.73
<b>MC 4560</b>	95	67	28	6.3	71.1	23.5	38.8	47.3	0.74
<b>DL Stealth 3195Q</b>	95	67	25	6.0	68.2	26.6	42.8	42.6	0.71
<b>Eur ES 7201</b>	100	70	27	5.7	69.9	24.9	40.4	46.2	0.73
<b>FDS HD 95-90</b>	95	68	19	7.0	72.3	22.0	37.9	48.2	0.75

**Table 7.** Yield results for 102-109 RM silage varieties.

Variety	Corrected Yield T/A (32% DM)	Stand Density	Test Means Separation-Yield
<b>Eur X1151</b>	35.2	35021	A
<b>MC 5250</b>	34.3	34375	A
<b>MC 527</b>	32.5	33297	A
<b>FDS HDS 102-44</b>	31.8	28987	A
<b>DL Hi DF 3702-9</b>	31.4	33405	A
<b>Eur X1190</b>	31.3	36099	A
<b>Eur X9049</b>	30.3	33836	A
<b>Eur X1050</b>	29.6	37392	A
<b>MC 535</b>	29.6	34698	A
<b>Mean</b>	31.8	34123	
<b>LSD (.05)</b>	5.6	2291.5	
<b>CV%</b>	12.2	4.6	

**Table 8.** Quality results for 102-109 RM silage varieties (NIR).

Treatment	Moisture Corrected Yield 32%	Crude Protein % DM	TDN %DM	ADF %DM	NDF %DM	Starch % DM	Non Fiber CHO % DM	NEL Mcal/lb	Milk lbs/acre
<b>MC 5250</b>	34	6.3	72.0	22.3	37.6	37.9	50.2	0.76	39930
<b>Eur X1151</b>	36	6.6	66.0	23.2	40.7	30.4	46.9	0.68	37778
<b>FDS HDS 102-44</b>	32	6.2	70.0	23.5	39.7	34.8	47.1	0.73	36198
<b>MC 527</b>	33	6.6	68.0	23.8	40.7	33.0	45.2	0.70	35996
<b>Eur X1190</b>	31	6.3	66.0	25.3	41.7	30.3	46.1	0.68	34608
<b>Eur X1050</b>	30	6.5	26.2	41.9	40.4	29.0	45.6	0.67	31508
<b>DL Hi DF 3702-9</b>	31	6.8	67.0	24.3	41.4	31.0	44.8	0.70	31474
<b>Eur X9049</b>	30	6.9	66.0	23.3	38.8	31.6	48.8	0.69	31122
<b>MC 535</b>	30	6.4	67.0	23.8	39.6	31.6	47.1	0.70	31033

Quality results not replicated. Only ranked by milk lbs/acre

**Table 9.** Quality results for 102-109 RM silage varieties (**Wet Chemistry**).

<b>Treatment</b>	<b>Relative Maturity</b>	<b>Harvest Moisture %</b>	<b>Moisture Corrected yield 32%</b>	<b>Crude Protein % DM</b>	<b>TDN %DM</b>	<b>ADF %DM</b>	<b>NDF %DM</b>	<b>Non Fiber CHO % DM</b>	<b>NEL Mcal/lb</b>
<b>MC 5250</b>	102	68	34	5.6	71.4	23.3	37.9	48.9	0.74
<b>Eur X1151</b>	109	70	36	6.0	70.6	24.4	39.7	47.4	0.73
<b>FDS HDS 102-44</b>	102	69	32	5.6	71.2	25.2	39.6	47.7	0.74
<b>MC 527</b>	105	70	33	6.0	70.5	24.8	38.2	47.9	0.73
<b>Eur X1190</b>	104	67	31	5.6	69.6	25.0	39.9	46.3	0.72
<b>Eur X1050</b>	106	69	30	5.5	68.7	26.9	43.0	43.2	0.71
<b>DL Hi DF 3702-9</b>	102	72	31	6.9	70.0	26.0	40.7	44.7	0.73
<b>Eur X9049</b>	106	70	30	6.1	71.6	24.8	38.4	48.7	0.75
<b>MC 535</b>	107	71	30	5.7	70.1	25.0	40.0	46.5	0.73

### SUMMARY

The 2011 University of Idaho silage trials yielded above the regional average of 25 T/A. The five highest yielding varieties in the trial were Masters Choice 4050 yielding 37.7 T/A, Eureka X1151 yielding 35.2 T/A, Masters Choice 5250 yielding 34.3 T/A, Masters Choice 527 yielding 32.5 T/A, and Foundation Direct Seed HDS 102-44 yielding 31.8 T/A. The top five varieties for average milk/acre were Masters Choice 4050 at 45,695, Masters Choice 5250 at 39,930, Eureka at 37,778, Foundation Direct Seed HDS 102-44 at 36,198, and Masters Choice 527 at 35,996.

**Table 10.** Index of silage varieties.

Variety*	RM
Eur 1098	79
Eur 1058	85
FDS 85-30	85
FDS 90-22	90
MC 4050	90
MC 4280	92
DL 3195	95
FDS 95-90	95
MC 4560	95
Eur 1031	99
Eur ES 7201	100
DL Hi DF 3702-9	102
FDS 102-44	102
MC 5250	102
Eur 1190	104
MC 527	105
Eur 1050	106
Eur 9049	106
MC 535	107
Eur 1151	109

DL= Dairyland Seed Company  
DKC= DeKalb-Monsanto Company  
Eur= Eureka Seed  
FDS= Foundation Direct Seed  
MC= Masters Choice

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## University of Idaho Twin Falls County 2010 Silage Corn Variety Trials

Steven L. Hines<sup>1</sup>

### ABSTRACT

Idaho is ranked 3<sup>rd</sup> in the nation for milk production. As the Idaho dairy industry has grown, acres of corn produced for silage have increased as well. In 1989, Idaho producers planted 78,000 acres for silage production. In 2010, Idaho producers planted approximately 215,000 acres of corn for silage. In 2008, a corn grain variety trial program was started through the University of Idaho Twin Falls County Extension office and in 2009 the program was expanded to include silage varieties. The data from these trails can be combined with industry data to help producers choose the best corn varieties for their growing conditions and management objectives.

**Keywords:** Corn, silage, variety trials, yield, quality

### INTRODUCTION

The 2010 corn variety trial was conducted by Steve Hines from the University of Idaho, Twin Falls County Extension office. The trial location was the University of Idaho Kimberly Research and Extension Center farm located at Kimberly, Idaho. There were 13 entries by 4 seed companies for silage and 9 entries by 1 company for grain. Hybrids ranged between 85-110 days relative maturity (RM).

### Methods

The trial was a randomized complete block design with 4 replications. Silage varieties were split into three separate trials based on RM (85, 91-101, and 107-110). Individual plots for silage were 4-30" rows x 20 feet. The center two rows were harvested and evaluated for yield and quality.

### Silage Analysis

Silage quality analysis was determined by NIRS (Near Infrared Spectral) analysis 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. IVTD 24 hr= In vitro digestible dry matter. A measure of digestibility at 24 hours in the rumen. Higher is more desirable.
2. CP= Crude protein. Higher protein levels indicate less need for more expensive supplements in the ration.
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. NEL= Net energy for lactation. An energy measurement used in estimating amount of energy available for milk production. Higher is more desirable.

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<sup>1</sup> S. Hines, Extension Educator, University of Idaho, Twin Falls County Extension, 246 3<sup>rd</sup> Ave E., Twin Falls, ID 83301. Published **In:** Proceedings, Idaho Hay and Forage Conference 22-23 February 2011, Burley, ID, University of Idaho Extension.

### **Agronomic Information**

The field is located approximately 1 ½ 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. Herbicide treatment included one application of Dual Magnum at a rate of 1.5 pints/ac pre-plant incorporated. No additional herbicides were used. No insecticides were used. The plots were planted with an Almaco Twin Plate 2 vacuum planter. Silage varieties were harvested with a John Deere two row forage harvester. Late in the season aphids were very evident across the trials. Very few western corn root worm adults (*Diabrotica virgifera*) were observed.

### **RESULTS**

**85 days relative maturity-** Plots were planted May 18<sup>th</sup>. Harvest took place on September 30<sup>th</sup>. Harvest moisture was corrected to 32% dry matter. The results for yield are shown in Table 1. The results for quality are shown in Table 2. For all results in this report, quality data were not statistically analyzed, as there was only one sample for each variety submitted for quality testing. Milk per acre is given as one method to compare the quality data and not meant to be the only method. In the yield tables, varieties with the same means separation letter (A, B, or C) indicate no statistical difference between those varieties.

### **CONCLUSION**

The full report including results for the grain varieties can be obtained from Twin Falls County Extension office website at [www.uidaho.edu/extension/twinfalls/pages/cropsresources](http://www.uidaho.edu/extension/twinfalls/pages/cropsresources) The Idaho on-farm corn silage production average yield is 25.5 tons/acre. All results in the 2010 variety trial equaled or exceeded this average even in a difficult growing year with fewer growing degree days. These yields were obtained on small plots under careful management. There will likely be some yield reduction under farm scale production due to differences in soil type, fertility levels, planting densities, weed controls, and irrigation practices to name a few.

**Table 1. Yield results for 85 RM silage varieties.**

Variety	Corrected Yield T/A (32% DM)	Days to Silk	Stand Density	Test Means Separation-Yield
CR Exp-1	24.95	67	32346	A
CR Exp-2	28.30	63	33114	A
Mean	26.6	65	32,730	
LSD (.05)	3.5	0*	1047	
CV%	5.8	0*	1.4	

\*since the results for each treatment was the same, variability cannot be calculated

**Table 2. Quality results for 85 RM silage varieties.**

Treatment	Relative maturity	Harvested Yield Composite	Harvest Moisture %	Moisture Corrected yield 68%	Tons DM/a	Crude Protein %DM	ADF %D M	NDF %D M	Starch %DM	IVT D 24 hr % DM	NEL Mcal /lb	Milk lbs/ton DM	Milk lbs/acre
CR EX-2	85	34	73.4	28	9.0	8.6	24.5	42.4	25.6	83	0.74	3564	32233
CR EX-1	85	34	76.6	25	8.0	8.9	24.6	40.5	26.1	79	0.73	3451	27456

Quality results not replicated. Only ranked by Milk lbs/acre

**91-101 days relative maturity-**Plots were planted May 11<sup>th</sup>. The plots were harvested October 5<sup>th</sup>. Harvest moisture was corrected to 32% dry matter. The results for yield are shown in Table 3. Results for quality are shown in Table 4.

**Table 3. Yield results for 91-101 RM silage varieties.**

<b>Variety</b>	<b>Corrected Yield T/A (32% DM)</b>	<b>Days to Silk</b>	<b>Stand Density</b>	<b>Test Means Separation-Yield</b>
<b>EU 1041</b>	35.43	67	35855	A
<b>MY 2L533</b>	35.30	72	34869	A
<b>MY 2R522</b>	33.08	70	37500	A
<b>MC 490</b>	33.05	69	36732	A
<b>EU 1084</b>	32.12	67	35855	A B
<b>EU 7110</b>	31.60	66	33991	A B
<b>MY 383</b>	28.30	72	34978	B
<b>Mean</b>	32.70	68.9	35680	
<b>LSD (.05)</b>	4.0	1.48	1257	
<b>CV%</b>	8.3	1.4	2.4	

**Table 4. Quality results for 91-101 RM silage varieties.**

Treatment	Relative maturity	Harvested Yield Composite	Harvest Moisture %	Moisture Corrected yield 68%	Tons DM/a	Crude Protein %DM	ADF %DM	NDF %DM	Starch % DM	IVTD 24hr % DM	NEL Mcal/lb	Milk lbs/ton DM	Milk lbs/acre
<b>EU 1041</b>	100	38	70.3	35	11.3	6.8	25.2	40.6	30.7	78	0.73	3357	38087
<b>EU 1084</b>	93	32	68.0	32	10.3	7.7	23.1	38.8	34.9	78	0.78	3585	36825
<b>MY 2R522</b>	98	36	70.8	33	10.6	7.5	22.8	37.9	33.7	79	0.76	3418	36229
<b>MC 490</b>	98	37	71.6	33	10.6	7.7	23.9	38.4	32.9	78	0.77	3385	35762
<b>EU 7110</b>	91	31	66.9	32	10.1	7.3	24.6	39.1	29.5	79	0.71	3208	32386
<b>MY 2L533</b>	101	38	73.1	32	10.2	7.4	28.0	44.0	23.9	77	0.67	3152	32220
<b>MY 383</b>	95	33	72.6	28	9.0	8.3	25.0	40.3	29.0	84	0.74	3396	30707

Quality results not replicated. Only ranked by Milk lbs/acre

**107-110 days relative maturity**-Plots were planted May 18<sup>th</sup>. The plots were harvested October 5<sup>th</sup>. Harvest moisture was corrected to 32% dry matter. The results for yield are shown in Table 5. Results for quality are shown in Table 6.

**Table 5. Yield results for 107-110 RM silage varieties.**

Variety	Corrected Yield T/A (32% DM)	Days to Silk	Stand Density	Test Means Separation-Yield
My 2Q717	35.50	73	36404	A
MC 533	35.00	70	36184	A
My 665	33.18	78	36075	A B
My 622	30.45	76	36404	B
Mean	33.50	74	36267	
LSD (.05)	2.96	3.33	NS*	
CV%	5.52	2.8	1.48	

\*not significant

**Table 6. Quality results for 107-110 RM silage varieties.**

Treatment	Relative maturity	Harvested Yield Composite	Harvest Moisture %	Moisture Corrected yield 68%	Tons DM/a	Crude Protein % DM	ADF %DM	NDF %DM	Starch % DM	IVTD 24hr % DM	NEL Mcal/lb	Milk lbs/ton DM	Milk lbs/acre
MC 533	107	42	73.5	35	11.2	7.0	23.8	39.4	31.7	79	0.73	3378	37866
MY 2Q717	110	41	72.4	35	11.3	7.4	26.2	43.1	27.3	74	0.74	3161	35857
MY 665	109	39	72.6	33	10.6	8.2	29.4	47.2	21.4	79	0.67	3194	33956
My 622	109	40	75.6	30	9.7	8.4	28.6	45.4	22.8	84	0.67	3195	31105

Quality results not replicated. Only ranked by Milk lbs/acre