



2021 Corn Silage Field Crop Trials Results

Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

The Minnesota Hybrid Corn Silage Evaluation Program evaluates the silage potential of corn hybrids in Minnesota. The goal of the program is to provide unbiased forage yield and forage quality information for educational and marketing programs.

The program is financed in part by entry fees from private seed companies that choose to enter hybrids for testing, which are listed below. Results are presented from the two corn silage performance trials, Southeast (SE) located in Rochester; and Central (CE) located in Hutchinson. Entries from the southeast and central sites are also evaluated at Waseca in trials designated as Waseca SE and Waseca CE. Trials at each location were split into early and late corn hybrid maturities, to facilitate harvesting the corn silage at about 65% whole plant moisture.

Test Procedures

Plots were established at each test site in a randomized complete block design with four replications.

Planting and harvesting dates were:

Location	Planting Date	Early Harvest	Late Harvest
Waseca CE	Apr. 26	Aug. 25	Aug. 30
Waseca SE	Apr. 26	Aug. 30	Aug. 30
Rochester SE	May 6	Sept. 10	Sept. 14
Hutchinson CE	May 7	Aug. 31	Aug. 31

Hybrid entries were planted at 35,000 seeds per acre with a 30-inch row spacing. Plant nutrients and herbicides

were applied according to University of Minnesota recommendations.

Plots were harvested and whole-plant herbage sampled for determination of dry matter content and forage quality. Test sites were harvested when the average whole-plant moisture across entries was estimated to be 65%.

Results Provided

Tables 1-8 summarize hybrid yield and forage quality results from Hutchinson, Rochester, and Waseca. Moisture content, whole-plant dry matter (DM) yield, and silage yield at harvest moisture are listed. Hybrids are ranked in descending order of milk yield per acre (Milk Yield, lb/acre). Genetic trait information is supplied by companies entered in the hybrid corn silage performance trials.

Whole-plant forage quality characteristics tested include moisture (%), crude protein (CP, % DM), neutral detergent fiber (NDF, % DM), undigestible NDF at 240 hour (uNDF, % NDF), total tract NDF digestibility (TTNDFD, % of NDF), starch concentration (% DM), and

in situ rumen degradable starch at 7 hours (StarchD, % of starch). All forage quality variables were predicted using Near-Infrared Reflectance Spectroscopy calibrated using laboratory procedures (Rock River Laboratory; <https://www.rockriverlab.com>).

Milk production potential per ton (lb milk/ton forage) and per acre (lb milk/acre) of forage was calculated using the MILK2006 model developed by the University of Wisconsin. MILK2006 approximates animal performance based on a standard cow weight and milk production level (1,350 lb body weight and 90 lb/day at 3.8% fat).

For MILK2006 predictions, we assumed that kernel processing occurred. Milk production (lb milk/ton and lb milk/acre) values can be used as a quick reference for comparison of hybrids within test locations.

How to Use Results

NDF is a negative indicator of forage intake potential; higher NDF

Companies Participating in 2021 Hybrid Corn Silage Performance Trials.

AgriGold Hybrids	www.agrigold.com
Bayer Crop Science	www.dekalbasgrowdeltapine.com
Dairyland Seed	www.dairylandseed.com
Golden Harvest	www.goldenharvestseeds.com
Legacy Seeds	www.legacyseeds.com
Peterson Farms Seed	www.petersonfarmsseed.com
Thunder Seed	thunderseed.com
Viking Seed	www.alseed.com

concentration generally implies lower intake potential. NDFD estimates digestibility of the NDF fiber fraction. Starch content, a grain component, is positively associated with overall forage digestibility because of its high digestibility. Relatively higher starch concentrations generally predict greater animal performance potential. TTNDFD (total tract NDF digestibility) is an advanced research validated model to predict forage digestibility in dairy cattle rations. It combines both rate of digestion and indigestibility of NDF. Milk yield per acre represents the combined effects of silage yield and quality.

Corn hybrids differed in yield, forage quality parameters and milk production potential at all sites. Means and least significant difference (LSD)

values at the 20% probability level are shown for each parameter. Where the difference between the two hybrids for a particular yield or quality trait is greater than the LSD value, there is a 80% probability that there is a significant difference between the two hybrids for that parameter (i.e., moisture, yield, quality concentration or milk production). A difference less than the LSD value probably is due to environmental factors.

Figures 1-8 summarize the relationship between silage dry matter yield and milk per ton for test sites at Hutchinson, Rochester, and Waseca. The figures also highlight those entries at each site that have a combination of high silage dry matter yields and milk production per ton.

Authors and Researchers

Thomas Hoverstad, Wade Ihlenfeld and Craig Sheaffer.



Table 1. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield and quality traits for SE zone early RM corn hybrids planted at Rochester, MN in 2021.

No.	Source	Brand	Traits ¹	Moisture		Yield, Tons/Acre ²		Forage Quality (concentration), %						Milk Yield ⁹	
				RM	%	Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDFD ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre
1	Peterson Farms Seed	2LF95	GLY	95	60.4	33.0	13.0	7.4	39.3	12.6	36.5	36.6	55.3	3012	39220
2	Viking	51-04	-	104	61.5	31.0	12.0	6.7	37.0	11.5	38.4	40.3	55.5	3089	36916
3	AgriGold	A636-11STXRIB	Bt, CRW, GLY, LL	106	62.8	32.3	12.0	7.1	36.3	10.8	39.3	40.8	56.6	3067	36758
4	Dairyland Seed	DS-4878AM	Bt, GLY, LL	106	67.6	35.7	11.6	7.5	38.4	11.6	39.9	38.3	58.3	3068	35561
5	Dairyland Seed	HiDF-4545Q	Bt, CRW, GLY, LL	105	64.6	32.1	11.4	7.4	35.5	10.0	42.1	40.6	57.2	3126	35450
6	Dairyland Seed	DS-4840AM	Bt, GLY, LL	108	64.3	31.4	11.3	7.1	37.6	11.0	41.3	39.5	60.3	3123	35293
7	AgriGold	A633-14STX	Bt, CRW, GLY, LL	103	64.8	33.8	11.9	7.3	40.0	12.3	39.0	34.7	56.2	2949	35072
8	Dekalb	DKC50-87	Bt, CRW, GLY, LL	100	57.6	31.5	12.3	7.0	34.0	11.2	36.8	43.5	54.1	3073	35053
9	Dairyland Seed	HiDF-3802Q	Bt, CRW, GLY, LL	102	65.5	33.2	11.4	7.7	37.6	10.7	42.0	38.1	56.9	3057	34934
10	Dairyland Seed	HiDF-4073Q	Bt, CRW, GLY, LL	100	61.5	30.1	11.6	6.8	39.0	11.7	40.7	37.7	58.1	2994	34593
11	AgriGold	A636-16	-	106	64.0	32.0	11.5	7.2	38.2	11.6	39.6	38.2	60.2	2985	34348
12	Dekalb	DKC56-65	Bt, CRW, GLY, LL	106	64.4	30.5	10.9	7.5	35.7	9.7	41.9	41.1	58.0	3139	34123
13	Peterson Farms Seed	73P01	Bt, GLY	101	62.2	29.6	11.2	6.5	39.5	11.8	39.4	37.9	58.6	2984	33488
14	Legacy Seeds	LC555-21	Bt, CRW, GLY, LL	105	65.3	32.1	11.2	7.4	41.0	12.3	40.9	35.0	58.9	2955	33092
15	Legacy Seeds	LC533-20	Bt, CRW, GLY, LL	103	60.6	27.6	10.9	7.5	39.2	12.6	37.0	37.3	53.5	3002	32788
16	Peterson Farms Seed	2LF01	GLY	101	66.7	35.3	11.8	7.1	47.3	15.7	37.2	26.9	57.3	2727	32098
17	Dekalb	DKC52-18	Bt, CRW, GLY, LL	102	64.3	30.1	10.8	7.2	38.3	11.9	37.8	38.3	56.3	2967	31938
18	Peterson Farms Seed	78G95	Bt, GLY	95	53.6	22.6	10.4	6.7	35.4	11.5	37.4	43.2	54.8	3039	31558
19	AgriGold	A632-35-5222EZ	Bt, CRW, GLY, LL	102	61.0	27.5	10.7	6.8	42.0	13.5	37.6	34.6	55.9	2909	31357
20	Dekalb	DKC48-68	Bt, CRW, GLY, LL	98	58.0	27.0	10.5	7.1	41.8	14.3	35.2	35.5	54.7	2775	27131
Mean					62.5	30.9	11.4	7.1	38.7	11.9	39.0	37.9	56.8	3002	34039
LSD (0.20)					2.7	2.3	1.0	0.4	3.6	1.4	1.4	4.2	2.4	130	3757

¹ Bt, BL, CRW, GLY, LL, WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.
² Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.
³ Crude protein as a % of DM.
⁴ Neutral detergent fiber as a % of DM.
⁵ Undigestible NDF at 240 hour as a % of NDF.
⁶ Total tract NDF digestibility as a % of NDF.
⁷ Starch as a % of DM.
⁸ In situ rumen degradable starch at 7 hours as a % of starch.
⁹ Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

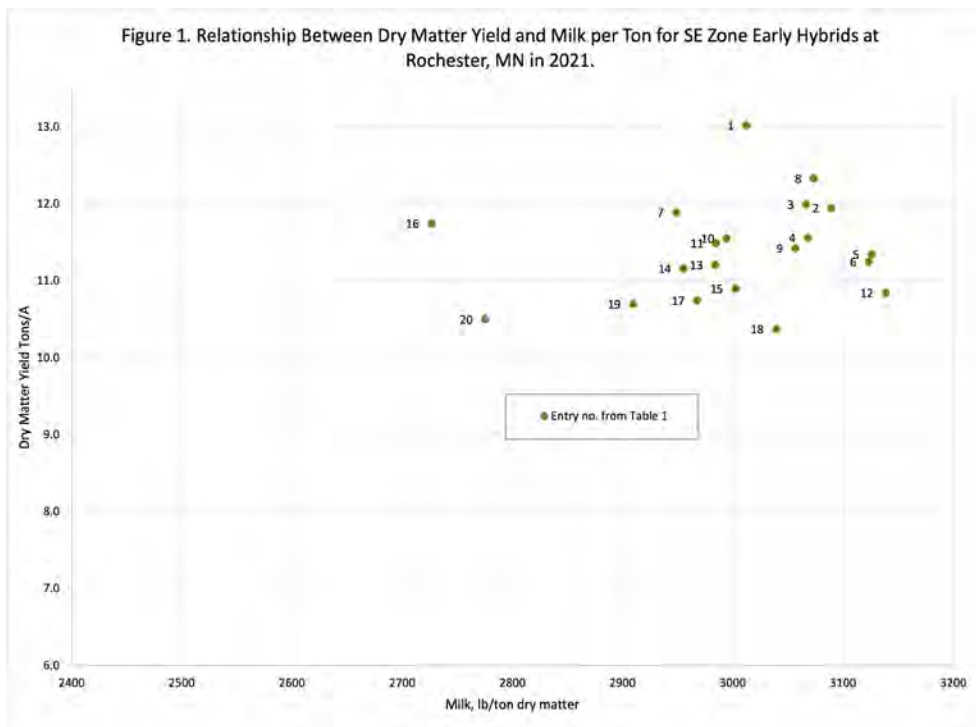


Table 2. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield, and quality traits for SE zone late RM corn hybrids planted at Rochester, MN in 2021.

No.	Source	Brand	Traits ¹	RM	Moisture %	Yield, Tons/Acre ²		Forage Quality (concentration), %					Milk Yield ⁹		
						Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDF ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre
1	Golden Harvest	G12S75-5122	Bt, CRW, GLY, LL	112	63.1	36.4	13.5	6.9	39.0	11.4	40.4	37.9	58.9	3020	40722
2	Dekalb	DKC58-64	Bt, CRW, GLY, LL	108	62.5	34.2	12.7	6.6	36.3	10.5	41.3	40.7	60.5	3103	39537
3	Legacy Seeds	LC623-21	Bt, CRW, GLY, LL	112	64.2	37.5	13.4	7.2	41.6	11.9	41.1	34.5	59.6	2929	39456
4	Viking	58-11	-	111	62.2	33.2	12.6	7.1	34.4	9.7	40.5	43.6	58.5	3099	38911
5	Viking	O.82-14	-	114	66.4	38.1	12.8	7.0	38.7	10.9	42.3	38.6	61.9	2946	37749
6	Golden Harvest	G07G73-5122	Bt, CRW, GLY, LL	107	64.4	35.2	12.5	7.1	39.1	11.3	40.6	37.5	61.0	2958	37094
7	Dairyland Seed	HiDF-4999Q	Bt, CRW, GLY, LL	109	67.0	36.2	11.9	7.4	37.4	9.9	43.2	38.4	60.8	3071	36720
8	Viking	48-08	-	108	63.2	31.9	11.7	6.6	35.7	10.0	42.0	42.1	60.9	3096	36273
9	Dekalb	DKC59-81	Bt, CRW, GLY, LL	109	64.3	32.2	11.5	7.5	36.6	10.3	40.0	40.3	58.8	3074	35697
10	Golden Harvest	G13P84-3120	Bt, GLY, LL	113	62.8	32.0	11.9	7.3	39.3	10.6	42.6	37.1	60.2	2988	35613
11	AgriGold	A638-74VT2RIB	Bt, GLY	108	62.3	31.6	11.9	7.3	38.7	11.3	40.4	38.4	57.6	2963	35182
12	AgriGold	A638-58STX	Bt, CRW, GLY, LL	108	64.7	33.4	11.7	7.4	36.6	10.3	40.7	40.9	59.3	3002	34963
13	AgriGold	A642-47STXRIB	Bt, CRW, GLY, LL	112	63.8	31.0	11.2	7.2	36.5	10.9	41.7	40.9	58.7	3112	34907
14	AgriGold	A639-70STXRIB	Bt, CRW, GLY, LL	109	64.9	32.1	11.2	7.4	36.7	10.4	40.1	40.6	57.2	3105	34805
15	Dairyland Seed	DS-5144Q	Bt, CRW, GLY, LL	109	65.3	34.6	12.0	7.1	42.8	12.9	43.6	33.3	61.9	2887	34709
16	Legacy Seeds	LC592-21	Bt, GLY, LL	109	64.0	30.6	11.0	7.4	40.7	12.0	40.8	35.7	59.9	2899	31826
17	Golden Harvest	G10D21-5332	Bt, CRW, GLY, LL	110	65.4	31.4	10.9	7.7	39.3	12.1	40.1	37.0	57.6	2918	31771
18	Dairyland Seed	HiDF-5202Q	Bt, CRW, GLY, LL	112	68.6	33.7	10.6	6.9	40.0	10.8	41.9	37.4	62.1	2966	31411
19	Golden Harvest	G13D55-5222	Bt, CRW, GLY, LL	113	66.2	32.2	10.9	7.0	42.2	12.6	40.4	34.1	60.9	2842	30970
Mean					64.5	33.5	11.9	7.2	38.5	11.0	41.2	38.4	59.8	2999	35701
LSD (0.20)					1.7	3.0	1.1	ns	3.2	1.3	1.6	3.3	2.3	121	4043

¹Bt,BL,CRW,GLY,LL,WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.
²Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.
³Crude protein as a % of DM.
⁴Neutral detergent fiber as a % of DM.
⁵Undigestible NDF at 240 hour as a % of NDF.
⁶Total tract NDF digestibility as a % of NDF.
⁷Starch as a % of DM.
⁸In situ rumen degradable starch at 7 hours as a % of starch.
⁹Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

Figure 2. Relationship Between Dry Matter Yield and Milk per Ton for SE Zone Late Hybrids at Rochester, MN in 2021.

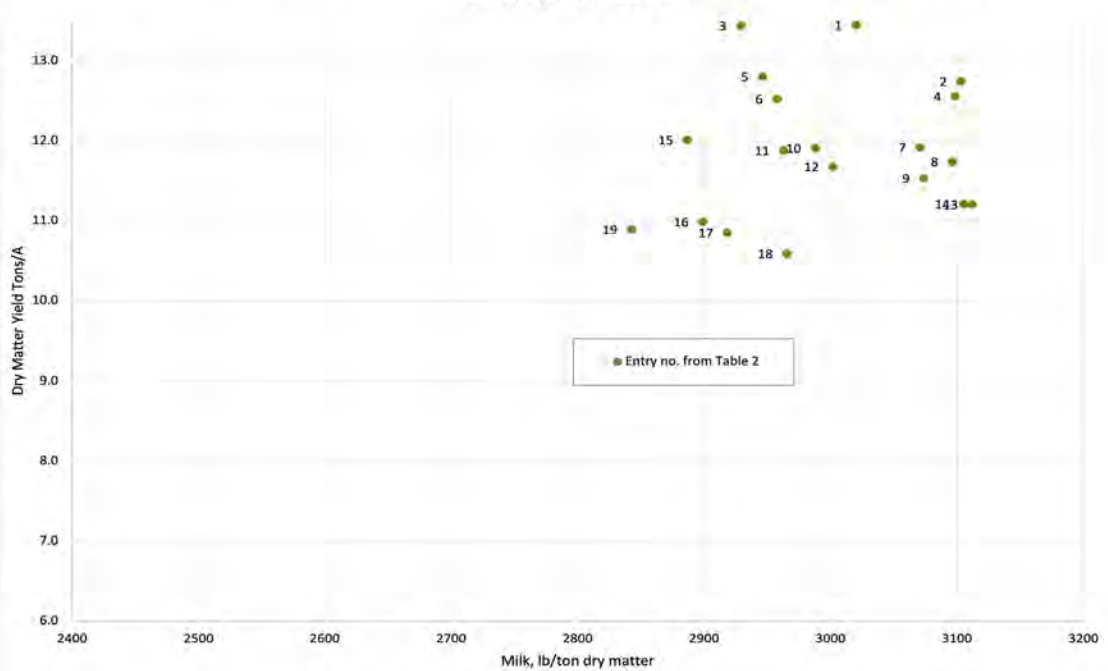


Table 3. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield, and quality traits for SE zone early RM corn hybrids planted at Waseca, MN in 2021.

No.	Source	Brand	Traits ¹	RM	Moisture %	Yield, Tons/Acre ²		Forage Quality (concentration), %					Milk Yield ⁹		
						Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDFD ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre
1	Dairyland Seed	HiDF-4545Q	Bt, CRW, GLY, LL	105	63.9	33.8	12.2	7.0	37.1	9.3	46.0	40.0	63.3	3076	37404
2	Dairyland Seed	DS-4840AM	Bt, GLY, LL	108	64.6	33.4	11.8	7.1	39.5	10.5	43.3	37.3	63.8	2998	35393
3	Viking	51-04	-	104	59.8	28.5	11.4	6.6	39.0	10.2	40.8	38.6	59.2	3023	34575
4	Dairyland Seed	DS-4878AM	Bt, GLY, LL	106	66.9	34.1	11.3	7.3	40.8	10.8	45.4	35.9	65.9	3010	34024
5	Peterson Farms Seed	2LF95	GLY	95	58.4	28.4	11.8	6.8	41.0	12.0	38.4	35.7	56.4	2876	33925
6	Dairyland Seed	HiDF-3802Q	Bt, CRW, GLY, LL	102	63.0	29.5	10.9	7.3	38.6	9.6	44.2	38.4	61.3	3035	33359
7	Peterson Farms Seed	78G95	Bt, GLY	95	57.3	24.2	10.8	6.7	38.3	10.2	41.8	40.0	59.5	3027	32579
8	Dairyland Seed	HiDF-4073Q	Bt, CRW, GLY, LL	100	59.9	27.0	10.8	6.5	38.9	10.2	42.5	39.2	61.5	2985	32393
9	Legacy Seeds	LC533-20	Bt, CRW, GLY, LL	103	60.4	27.0	10.7	7.2	39.6	10.7	41.2	37.5	59.5	2998	32103
10	AgriGold	A633-14STX	Bt, CRW, GLY, LL	103	64.8	29.9	10.5	7.0	37.4	9.9	41.6	38.9	61.0	2992	31614
11	AgriGold	A636-16	-	106	64.3	29.6	10.5	6.9	39.6	10.8	42.5	36.7	65.5	2954	31105
12	Dekalb	DKC56-65	Bt, CRW, GLY, LL	106	63.9	28.4	10.3	7.3	37.2	10.0	43.0	39.7	61.1	3010	31065
13	Peterson Farms Seed	73P01	Bt, GLY	101	59.6	25.5	10.3	6.5	37.3	10.0	39.7	41.1	59.1	3001	30789
14	AgriGold	A632-35-5222EZ	Bt, CRW, GLY, LL	102	61.2	26.3	10.2	7.0	38.9	11.2	40.0	38.1	58.7	2959	30074
15	AgriGold	A636-11STXRIB	Bt, CRW, GLY, LL	106	64.8	28.5	10.1	7.0	40.6	11.0	42.2	36.0	62.2	2926	29447
16	Dekalb	DKC52-18	Bt, CRW, GLY, LL	102	62.2	27.2	10.3	7.1	39.4	11.1	40.7	37.1	58.1	2868	29355
17	Dekalb	DKC50-87	Bt, CRW, GLY, LL	100	62.0	25.3	9.7	6.6	38.8	10.9	40.0	39.5	60.2	2908	28735
18	Legacy Seeds	LC555-21	Bt, CRW, GLY, LL	105	61.5	25.1	9.7	7.5	39.2	10.6	40.9	37.8	58.5	2963	28698
19	Dekalb	DKC48-68	Bt, CRW, GLY, LL	98	60.6	24.3	9.6	6.7	39.3	11.3	38.5	39.1	59.9	2817	27018
20	Peterson Farms Seed	2LF01	GLY	101	67.8	30.2	9.7	6.8	51.4	15.0	40.9	22.8	66.5	2598	25349
Mean					62.3	28.3	10.6	6.9	39.6	10.8	41.7	37.5	61.1	2951	31450
LSD (0.20)					1.5	2.2	0.9	0.3	3.6	1.4	1.5	4.0	2.0	124	3113

- ¹Bt, BL, CRW, GLY, LL, WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.
- ²Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.
- ³Crude protein as a % of DM.
- ⁴Neutral detergent fiber as a % of DM.
- ⁵Undigestible NDF at 240 hour as a % of NDF.
- ⁶Total tract NDF digestibility as a % of NDF.
- ⁷Starch as a % of DM.
- ⁸In situ rumen degradable starch at 7 hours as a % of starch.
- ⁹Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

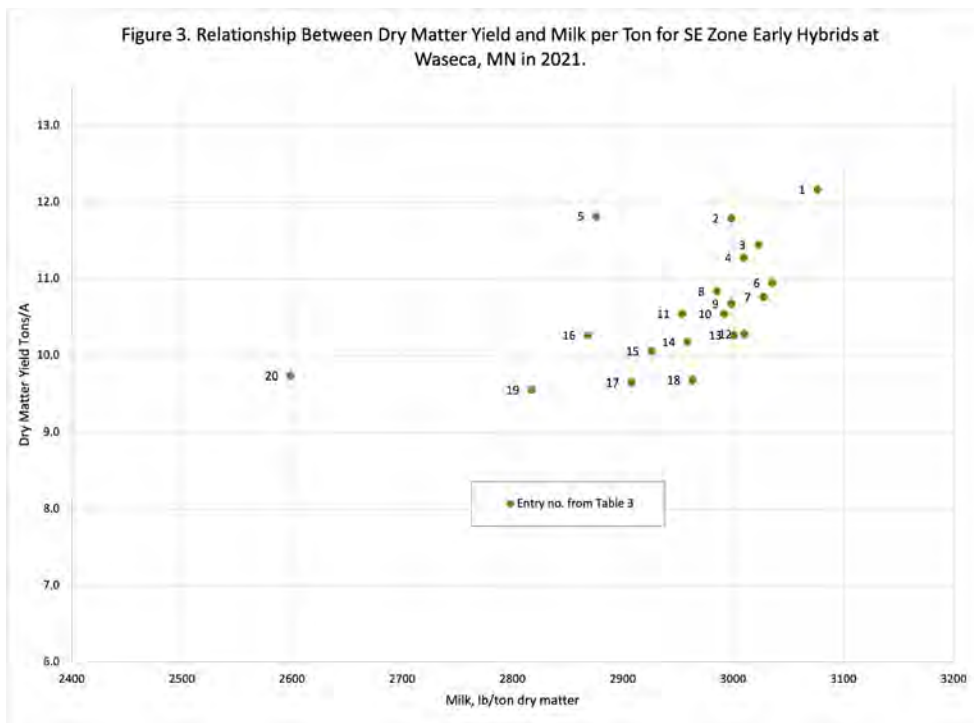


Table 4. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield, and quality traits for SE zone late RM corn hybrids planted at Waseca, MN in 2021.

No.	Source	Brand	Traits ¹	RM	Moisture %	Yield, Tons/Acre ²		Forage Quality (concentration), %					Milk Yield ⁹			
						Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDFD ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre	
1	Dairyland Seed	HiDF-5202Q	Bt, CRW, GLY, LL	112	66.2	35.1	11.9	7.2	35.9	8.8	44.5	40.5	59.8	3121	37077	
2	Dairyland Seed	HiDF-4999Q	Bt, CRW, GLY, LL	109	64.0	33.0	11.9	7.0	37.6	9.5	44.0	39.0	61.7	3051	36288	
3	AgriGold	A638-74VT2RIB	Bt, GLY	108	59.3	28.3	11.5	6.9	33.8	8.9	40.4	44.3	56.4	3129	36111	
4	Golden Harvest	G12S75-5122	Bt, CRW, GLY, LL	112	63.6	31.5	11.5	7.2	36.2	10.1	41.9	41.3	59.5	3071	35220	
5	Dairyland Seed	DS-5144Q	Bt, CRW, GLY, LL	109	63.3	30.9	11.4	6.8	37.9	10.1	43.5	39.5	61.8	3072	35079	
6	Legacy Seeds	LC623-21	Bt, CRW, GLY, LL	112	62.7	31.3	11.7	6.7	38.8	10.6	41.9	38.9	61.0	2994	34988	
7	Viking	58-11	-	111	60.7	28.3	11.1	6.6	36.6	9.9	40.7	41.0	57.8	3081	34355	
8	Dekalb	DKC58-64	Bt, CRW, GLY, LL	108	64.0	30.3	10.9	7.1	36.1	9.9	42.2	41.2	60.5	3133	34103	
9	Golden Harvest	G13D55-5222	Bt, CRW, GLY, LL	113	64.3	31.4	11.2	6.9	37.3	10.4	41.6	39.6	58.3	3020	33861	
10	Golden Harvest	G07G73-5122	Bt, CRW, GLY, LL	107	64.2	31.0	11.1	6.9	39.0	11.6	41.3	38.4	60.5	2989	33180	
11	AgriGold	A639-70STXRIB	Bt, CRW, GLY, LL	109	62.4	28.0	10.6	7.3	36.8	10.3	41.3	40.4	57.5	3134	33170	
12	Legacy Seeds	LC592-21	Bt, GLY, LL	109	63.4	30.3	11.1	7.1	38.5	10.6	42.2	38.4	60.0	2977	33160	
13	Dekalb	DKC59-81	Bt, CRW, GLY, LL	109	62.7	28.2	10.5	6.8	36.7	10.0	42.1	40.7	61.5	3086	32484	
14	Viking	48-08	-	108	60.4	26.1	10.3	6.7	33.7	9.4	41.2	44.4	58.2	3082	31858	
15	Golden Harvest	G13P84-3120	Bt, GLY, LL	113	63.5	29.2	10.7	7.3	39.0	10.7	41.7	37.6	58.0	2970	31750	
16	Golden Harvest	G10D21-5332	Bt, CRW, GLY, LL	110	63.9	28.4	10.3	7.2	37.2	10.2	41.8	39.8	57.8	3007	31079	
17	AgriGold	A638-58STX	Bt, CRW, GLY, LL	108	62.0	27.0	10.2	7.1	36.8	10.4	40.4	40.6	56.2	2998	30785	
18	Viking	O.82-14	-	114	68.1	34.1	10.9	6.6	44.0	12.7	43.6	32.1	63.7	2807	30644	
19	AgriGold	A642-47STXRIB	Bt, CRW, GLY, LL	112	64.1	28.6	10.3	7.2	39.2	11.0	41.3	37.6	59.8	2958	30373	
Mean					63.3	30.1	11.0	7.0	37.4	10.3	42.0	39.8	59.5	3036	33451	
LSD (0.20)					1.6	2.3	1.0	0.3	3.7	1.5	1.5	1.5	3.9	2.4	134	3962

¹Bt,BL,CRW,GLY,LL,WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.
²Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.
³Crude protein as a % of DM.
⁴Neutral detergent fiber as a % of DM.
⁵Undigestible NDF at 240 hour as a % of NDF.
⁶Total tract NDF digestibility as a % of NDF.
⁷Starch as a % of DM.
⁸In situ rumen degradable starch at 7 hours as a % of starch.
⁹Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

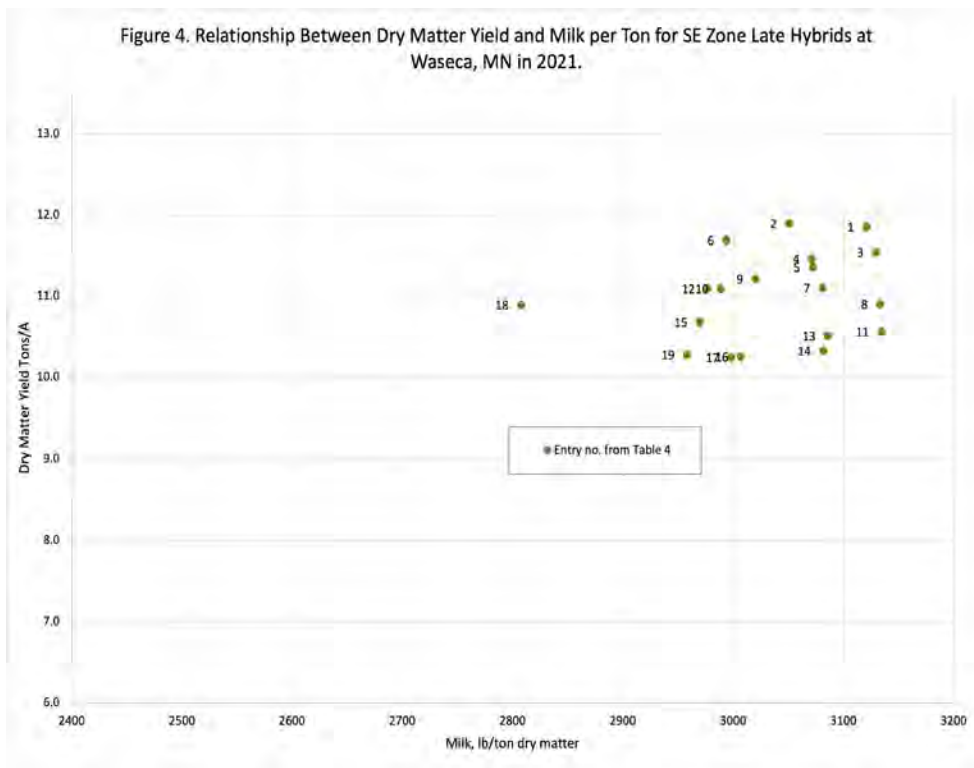


Table 5. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield, and quality traits for Central zone early RM corn hybrids planted at Hutchinson, MN in 2021.

No.	Source	Brand	Traits ¹	RM	Moisture %	Yield, Tons/Acre ²		Forage Quality (concentration), %					Milk Yield ⁹		
						Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDF ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre
1	AgriGold	A631-90	-	101	57.2	22.6	9.6	7.2	33.7	9.8	39.0	44.1	54.6	3101	29808
2	Dairyland Seed	HiDF-4073Q	Bt, CRW, GLY, LL	100	59.1	23.5	9.7	7.1	36.8	10.6	40.9	40.2	57.0	3055	29794
3	AgriGold	A630-04	-	100	60.5	23.8	9.4	7.5	35.3	10.3	41.2	41.8	57.7	3020	28359
4	Dekalb	DKC50-87	Bt, CRW, GLY, LL	100	59.6	23.5	9.5	7.1	36.5	11.0	39.1	40.9	56.4	2951	28023
5	AgriGold	A630-10STXRIB	Bt, CRW, GLY, LL	100	59.6	23.7	9.5	6.9	37.9	11.5	38.5	39.5	53.6	2943	27913
6	Legacy Seeds	LC-4248	Bt, GLY	100	58.3	21.6	8.9	6.9	34.1	10.4	37.2	43.9	50.0	3062	27317
7	Peterson Farms Seed	78G95	Bt, GLY	95	56.4	20.9	9.0	6.9	37.4	11.4	38.2	40.3	53.3	2986	26859
8	AgriGold	A630-95-5222EZ	Bt, CRW, GLY, LL	100	59.1	22.2	9.1	7.1	39.1	11.6	39.8	38.2	54.7	2937	26669
9	Legacy Seeds	LC484-20	Bt, GLY	98	57.6	20.5	8.7	7.2	35.9	10.1	39.5	41.4	53.7	3058	26561
10	Golden Harvest	G99E68-5122	Bt, CRW, GLY, LL	99	61.2	22.5	8.7	7.7	36.1	10.2	39.7	39.9	52.9	2965	25858
11	Dairyland Seed	DS-4018AM	Bt, GLY, LL	101	63.1	24.5	9.0	7.2	42.6	12.5	41.9	34.1	56.9	2829	25527
12	Viking	42-92	-	100	54.0	19.0	8.7	6.5	39.9	12.8	37.5	38.4	52.8	2906	25464
13	Dairyland Seed	HiDF-3522Q	Bt, CRW, GLY, LL	100	60.6	21.1	8.3	7.3	37.1	11.7	39.8	39.8	55.2	3003	25031
14	Dekalb	DKC48-68	Bt, CRW, GLY, LL	98	57.2	19.8	8.5	7.0	39.1	11.8	39.0	39.1	54.9	2912	24837
15	Legacy Seeds	LC503-21	Bt, CRW, GLY, LL	100	59.9	21.9	8.7	6.7	44.2	13.7	39.2	33.5	57.6	2779	24400
16	Golden Harvest	G96R61-5122	Bt, CRW, GLY, LL	96	61.1	20.7	8.0	7.3	39.0	11.3	39.3	37.8	55.1	2908	23452
17	Thunder Seed	EXS21-100	-	100	66.0	24.7	8.4	6.7	47.6	14.0	42.0	27.0	62.4	2750	23042
18	Peterson Farms Seed	73P01	Bt, GLY	101	58.5	19.1	7.9	6.1	41.8	12.7	37.1	36.6	54.7	2848	22573
19	Thunder Seed	T4001 HDRR	GLY	100	66.4	24.7	8.3	6.7	48.7	14.6	41.7	25.8	62.2	2716	22551
20	Peterson Farms Seed	2LF95	GLY	95	62.4	21.0	8.1	7.0	48.0	15.4	36.6	26.5	54.1	2609	21634
21	Peterson Farms Seed	2LF01	GLY	101	68.4	25.0	8.0	6.1	54.2	17.6	38.7	19.6	60.6	2482	21214
22	Thunder Seed	EXS21-98	-	98	59.6	17.7	7.1	6.5	46.4	14.0	39.6	30.6	58.3	2711	19459
23	Thunder Seed	T4995 HDRR	GLY	95	62.3	16.6	6.2	6.4	48.7	15.6	36.3	27.1	53.0	2543	15717
Mean					60.4	21.8	8.6	6.9	40.9	12.4	39.2	35.9	55.7	2873	24872
LSD (0.20)					2.6	2.6	1.1	0.6	5.1	2.2	2.4	5.5	3.6	178	3765

- ¹Bt, BL, CRW, GLY, LL, WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.
- ²Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.
- ³Crude protein as a % of DM.
- ⁴Neutral detergent fiber as a % of DM.
- ⁵Undigestible NDF at 240 hour as a % of NDF.
- ⁶Total tract NDF digestibility as a % of NDF.
- ⁷Starch as a % of DM.
- ⁸In situ rumen degradable starch at 7 hours as a % of starch.
- ⁹Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

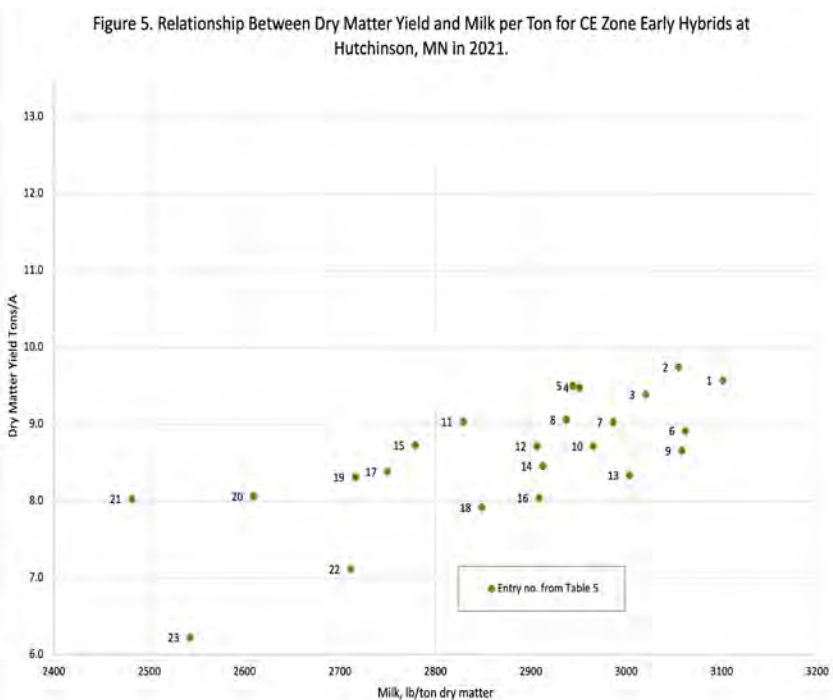


Table 6. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield, and quality traits for Central zone late RM corn hybrids planted at Hutchinson, MN in 2021.

No.	Source	Brand	Traits ¹	RM	Moisture %	Yield, Tons/Acre ²		Forage Quality (concentration), %					Milk Yield ⁹		
						Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDFD ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre
1	Dairyland Seed	DS-4329AM	Bt, GLY, LL	105	59.2	25.1	10.1	7.0	38.2	10.8	42.1	39.0	57.3	3065	31097
2	Dairyland Seed	DS-4840AM	Bt, GLY, LL	108	59.5	25.7	10.3	6.5	40.4	12.4	41.7	38.0	61.2	2998	31018
3	Viking	51-04		104	55.9	22.8	10.1	6.3	38.2	11.9	38.5	39.9	54.3	3003	30450
4	Golden Harvest	G02K39-5122	Bt, CRW, GLY, LL	102	57.6	23.3	9.7	7.2	35.0	10.3	39.1	42.6	53.3	3094	29975
5	Dairyland Seed	DS-4878AM	Bt, GLY, LL	108	58.0	25.5	9.8	6.8	38.0	11.3	41.3	39.3	59.1	3017	28825
6	Dekalb	DKC58-64	Bt, CRW, GLY, LL	108	60.6	25.1	9.7	6.6	40.5	12.7	38.9	36.6	57.0	2909	28346
7	Dairyland Seed	HiDF-4545Q	Bt, CRW, GLY, LL	105	60.8	24.4	9.3	7.0	38.9	11.1	42.9	38.0	59.9	3017	28237
8	Dekalb	DKC56-65	Bt, CRW, GLY, LL	106	58.0	23.4	9.8	6.8	40.9	12.3	39.7	36.1	57.7	2866	28015
9	Golden Harvest	G07G73-5122	Bt, CRW, GLY, LL	107	59.3	23.5	9.4	6.6	39.7	11.9	40.8	38.1	59.6	2949	27967
10	AgriGold	A633-14STX	Bt, CRW, GLY, LL	103	59.7	23.6	9.4	6.7	40.3	12.2	39.9	35.2	58.5	2903	27414
11	AgriGold	A635-54VT2RIB	Bt, GLY	105	59.7	22.6	9.0	6.9	37.7	11.1	40.0	39.4	56.4	3013	27310
12	AgriGold	A636-11STXRIB	Bt, CRW, GLY, LL	106	61.6	24.0	9.2	6.5	41.4	12.5	38.8	36.2	55.8	2933	27065
13	Dekalb	DKC52-18	Bt, CRW, GLY, LL	102	59.8	23.0	9.2	6.5	40.7	12.3	38.8	36.7	55.7	2853	26227
14	Golden Harvest	G10D21-5332	Bt, CRW, GLY, LL	110	59.3	21.9	8.9	6.5	39.6	11.4	41.2	38.1	59.7	2924	26142
15	Legacy Seeds	LC533-20	Bt, CRW, GLY, LL	103	59.4	21.4	8.8	7.1	37.4	12.0	35.4	40.7	53.1	2952	25828
16	Dairyland Seed	HiDF-4999Q	Bt, CRW, GLY, LL	109	57.3	21.0	8.8	7.0	40.0	12.0	39.8	36.4	57.4	2916	25675
17	Legacy Seeds	LC555-21	Bt, CRW, GLY, LL	105	58.8	23.8	9.4	6.2	41.9	13.3	38.0	36.4	56.1	2844	25027
18	Legacy Seeds	LC592-21	Bt, GLY, LL	109	57.2	21.3	9.0	6.3	43.5	13.6	39.6	33.9	58.5	2755	24969
19	Legacy Seeds	LC623-21	Bt, CRW, GLY, LL	112	60.0	22.3	8.9	6.1	43.3	13.6	38.9	35.1	59.0	2796	24875
20	Dairyland Seed	DS-5144Q	Bt, CRW, GLY, LL	109	60.6	22.3	8.7	6.4	45.5	13.6	41.4	30.8	60.7	2848	24786
Mean					59.1	23.3	9.4	6.6	40.1	12.1	39.8	37.3	57.5	2933	27462
LSD (0.20)					ns	2.0	0.6	0.5	3.4	1.4	1.8	3.5	2.3	110	2115

¹Bt, BL, CRW, GLY, LL, WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.

²Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.

³Crude protein as a % of DM.

⁴Neutral detergent fiber as a % of DM.

⁵Undigestible NDF at 240 hour as a % of NDF.

⁶Total tract NDF digestibility as a % of NDF.

⁷Starch as a % of DM.

⁸In situ rumen degradable starch at 7 hours as a % of starch.

⁹Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

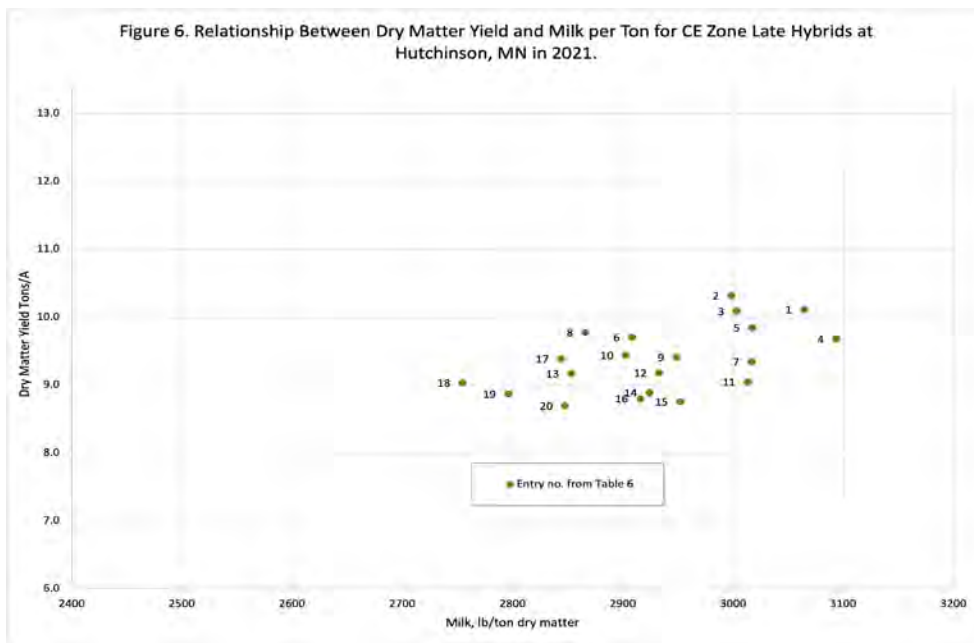


Table 7. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield, and quality traits for Central zone early RM corn hybrids planted at Waseca, MN in 2021.

No.	Source	Brand	Traits ¹	RM	Moisture %	Yield, Tons/Acre ²		Forage Quality (concentration), %					Milk Yield ⁹		
						Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDFD ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre
1	AgriGold	A631-90		101	64.6	30.7	11.0	7.1	37.1	10.2	42.7	39.8	61.3	3061	34095
2	Peterson Farms Seed	2LF95	GLY	95	64.6	30.0	10.6	7.6	39.3	10.6	43.4	36.5	61.0	3083	32765
3	Legacy Seeds	LC503-21	Bt, CRW, GLY, LL	100	62.1	27.1	10.3	7.3	39.7	11.6	42.1	37.6	60.1	2999	30777
4	Thunder Seed	T4995 HDRR	GLY	95	64.1	28.1	10.1	7.3	42.0	12.2	42.6	34.1	60.3	2921	29510
5	Dairyland Seed	DS-4018AM	Bt, GLY, LL	101	64.4	27.4	9.8	6.8	39.8	10.3	44.6	37.3	61.4	2987	29145
6	Dairyland Seed	HiDF-4073Q	Bt, CRW, GLY, LL	100	66.2	29.2	9.9	7.1	40.8	11.4	45.0	35.7	61.6	2922	28955
7	Dairyland Seed	HiDF-3522Q	Bt, CRW, GLY, LL	100	63.5	26.5	9.7	6.9	40.4	11.5	44.5	37.0	62.9	2977	28731
8	Legacy Seeds	LC484-20	BT, GLY	98	62.9	25.7	9.6	7.2	40.6	11.2	43.5	35.7	60.6	2974	28421
9	AgriGold	A630-04		100	65.9	27.9	9.5	7.0	39.0	11.1	42.6	38.0	61.6	2982	28182
10	Peterson Farms Seed	73P01	Bt, GLY	101	63.8	25.5	9.3	6.5	39.3	11.1	43.8	38.4	62.1	3035	28116
11	Legacy Seeds	LC-4248	BT, GLY	100	63.2	25.7	9.5	6.5	41.3	11.7	42.3	36.1	60.8	2943	27867
12	Golden Harvest	G99E68-5122	Bt, CRW, GLY, LL	99	65.6	28.4	9.8	7.2	42.3	12.3	42.4	33.1	61.7	2850	27811
13	AgriGold	A630-10STXRIB	Bt, CRW, GLY, LL	100	65.6	26.9	9.3	6.9	39.7	10.6	43.2	37.3	60.7	2981	27768
14	Dekalb	DKC50-87	Bt, CRW, GLY, LL	100	64.1	25.8	9.3	7.1	38.1	11.3	41.5	39.1	59.3	2983	27611
15	Thunder Seed	EXS21-98		98	64.4	26.0	9.2	7.4	42.2	12.2	42.0	33.7	60.6	2896	26749
16	AgriGold	A630-95-5222EZ	Bt, CRW, GLY, LL	100	64.9	25.5	9.0	7.4	42.2	11.6	43.0	34.1	59.3	2980	26715
17	Peterson Farms Seed	78G95	Bt, GLY	95	61.6	25.0	9.5	6.5	44.3	12.9	43.1	32.4	61.6	2802	26647
18	Golden Harvest	G96R61-5122	Bt, CRW, GLY, LL	96	65.5	26.4	9.1	7.3	41.6	11.4	42.6	34.0	61.1	2912	26556
19	Dekalb	DKC48-68	Bt, CRW, GLY, LL	98	63.9	25.1	9.0	7.0	41.0	12.1	41.2	36.3	61.4	2920	26270
20	Viking	42-92		100	62.5	22.6	8.5	6.9	42.1	11.6	44.3	35.0	61.6	2936	24951
21	Thunder Seed	EXS21-100		100	70.6	30.2	9.0	7.4	48.6	13.8	44.2	23.5	64.6	2666	24540
22	Thunder Seed	T4001 HDRR	GLY	100	69.2	31.0	9.4	6.9	48.6	14.3	42.7	24.6	65.9	2673	24395
23	Peterson Farms Seed	2LF01	GLY	101	69.5	30.0	9.2	7.1	50.0	14.9	41.8	22.8	66.4	2595	23817
Mean					64.9	27.2	9.5	7.1	41.7	11.8	43.0	34.4	61.6	2916	27843
LSD (0.20)					1.4	2.0	0.7	0.3	3.5	1.4	1.4	4.0	1.6	134	2772

¹Bt,BL,CRW,GLY,LL,WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.

²Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.

³Crude protein as a % of DM.

⁴Neutral detergent fiber as a % of DM.

⁵Undigestible NDF at 240 hour as a % of NDF.

⁶Total tract NDF digestibility as a % of NDF.

⁷Starch as a % of DM.

⁸In situ rumen degradable starch at 7 hours as a % of starch.

⁹Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

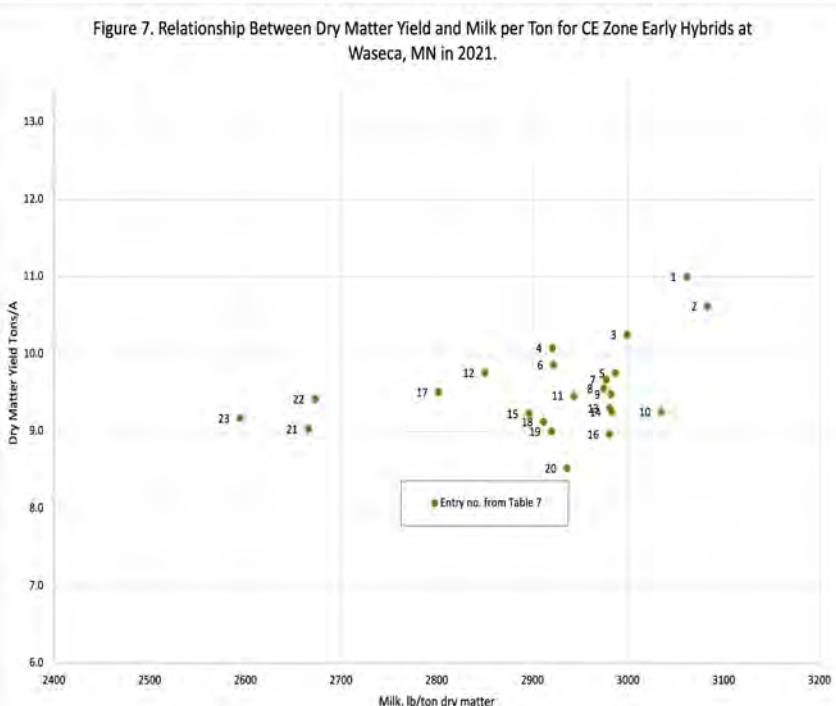


Table 8. Relative maturity (RM), whole plant moisture, dry matter (DM), silage yield, and quality traits for Central zone late RM corn hybrids planted at Waseca, MN in 2020.

No.	Source	Brand	Traits ¹	RM	Moisture %	Yield, Tons/Acre ²		Forage Quality (concentration), %					Milk Yield ⁹		
						Silage	DM	CP ³	NDF ⁴	uNDF ⁵	TTNDFD ⁶	Starch ⁷	StarchD ⁸	lb/Ton	lb/Acre
1	Golden Harvest	G07G73-5122	Bt, CRW, GLY, LL	107	65.3	34.3	12.1	7.1	41.6	11.7	42.6	35.2	62.3	2927	36397
2	Dekalb	DKC58-64	Bt, CRW, GLY, LL	108	65.0	32.6	11.4	7.1	38.9	10.8	42.5	37.8	61.2	3053	34898
3	AgriGold	A636-11STXRIB	Bt, CRW, GLY, LL	106	62.9	29.7	11.0	7.1	36.4	10.1	43.0	41.5	62.0	3129	34483
4	Golden Harvest	G10D21-5332	Bt, CRW, GLY, LL	110	63.1	29.2	10.7	7.5	38.6	10.3	43.6	38.3	59.3	3045	32814
5	Dairyland Seed	HiDF-4545Q	Bt, CRW, GLY, LL	105	64.7	30.9	10.9	7.2	40.4	11.1	45.4	36.4	64.7	2996	32761
6	Dairyland Seed	DS-4878AM	Bt, GLY, LL	108	66.1	32.0	10.8	7.4	39.9	11.2	44.0	37.0	64.0	2976	32217
7	Dairyland Seed	HiDF-4999Q	Bt, CRW, GLY, LL	109	66.9	32.6	10.8	7.2	40.8	10.7	43.5	34.9	63.1	2938	32008
8	Dairyland Seed	DS-4329AM	Bt, GLY, LL	105	65.5	31.3	10.8	7.1	40.4	10.8	44.6	36.4	61.8	2963	31997
9	Viking	51-04		104	61.1	26.0	10.1	6.8	37.1	10.2	41.1	40.8	58.0	3076	31173
10	Dairyland Seed	DS-5144Q	Bt, CRW, GLY, LL	109	64.5	29.0	10.3	7.0	38.8	10.5	43.5	38.1	63.0	2990	31121
11	Legacy Seeds	LC592-21	BT, GLY, LL	109	62.9	28.1	10.4	7.1	38.7	11.2	42.2	38.5	60.2	2994	31022
12	Legacy Seeds	LC623-21	Bt, CRW, GLY, LL	112	64.0	30.4	11.0	6.7	44.0	12.5	41.8	33.1	62.8	2829	30981
13	AgriGold	A635-54VT2RIB	Bt, GLY	105	63.4	27.4	10.0	6.7	38.6	10.6	41.9	39.2	61.5	3037	30585
14	Dairyland Seed	DS-4840AM	Bt, GLY, LL	106	65.6	30.5	10.5	7.1	41.6	11.8	42.8	34.9	62.0	2899	30541
15	Dekalb	DKC52-18	Bt, CRW, GLY, LL	102	61.0	25.5	9.9	7.1	37.5	10.1	42.4	40.4	59.0	3031	30075
16	AgriGold	A633-14STX	Bt, CRW, GLY, LL	103	66.1	30.1	10.2	7.1	39.8	10.7	43.3	36.3	62.4	2937	30048
17	Legacy Seeds	LC533-20	Bt, CRW, GLY, LL	103	61.2	26.2	10.2	6.9	43.4	12.8	40.8	33.8	60.5	2860	29257
18	Golden Harvest	G02K39-5122	Bt, CRW, GLY, LL	102	62.4	24.6	9.3	7.4	36.3	9.1	43.2	40.5	58.6	3099	28696
19	Legacy Seeds	LC555-21	Bt, CRW, GLY, LL	105	61.2	23.8	9.2	7.1	39.9	11.2	41.4	37.3	58.7	2950	27215
20	Dekalb	DKC56-65	Bt, CRW, GLY, LL	106	65.9	27.0	9.2	7.4	43.0	11.2	44.3	32.8	62.6	2886	26668
Mean					62.3	32.6	12.2	6.6	36.5	28.2	33.8	38.5	71.0	3,134	38,163
LSD (0.20)					1.9	2.3	0.9	NS	3.4	3.0	2.1	3.5	2.5	165	3343

¹Bt,BL,CRW,GLY,LL,WBC traits contain genes for resistance to European corn borer, broad spectrum lepidopteran, Corn rootworm, glyphosate herbicide, Liberty herbicide and Western bean cutworm, respectively.
²Silage yield is whole-plant corn yield at harvest moisture, DM is whole plant corn yield at 100% dry matter.
³Crude protein as a % of DM.
⁴Neutral detergent fiber as a % of DM.
⁵Undigestible NDF at 240 hour as a % of NDF.
⁶Total tract NDF digestibility as a % of NDF.
⁷Starch as a % of DM.
⁸In situ rumen degradable starch at 7 hours as a % of starch.
⁹Milk production was estimated using the MILK2006 model developed at the University of Wisconsin. Refer to the results provided text for additional information.

