Maine Corn Silage Hybrid Trial
2018 Results

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Location: Misty Meadows Farm, Clinton, Maine
Soil type: Woodbridge fine sandy loam
Planting date: May 22, 2018
Fertility: 5000 gallons/acre liquid manure + 125 lbs/A N as urea, preplant incorporated
Herbicide: glyphosate and Verdict (10 oz./acre) pre-emergence
Plot size: 15' x 75'
Treatment arrangement: Randomized complete block design with 3 replications
Target planting density: 32,000 plants/acre
Harvest date: September 13, 2018

Growing degree days: 2004 (86/50) (Climate Smart Farming)
Rainfall: 11.66 inches (Farm Logs)
Harvest weights: corn from each plot was chopped into a mixer wagon with scales.
Quality samples: Collected September 12, 2018. Three stalks per plot were randomly selected and chopped with a portable chipper. The chopped material was mixed, and a subsample was collected, frozen, and shipped for analysis (Cumberland Valley Analytical Services).

Data analysis: Analysis of variance was conducted using JMP. When a significant effect was found, linear regression analysis was conducted to see the effect of relative maturity on these parameters.

Results

Yield and Expected Milk Yield

Yields were corrected to a standard 30% dry matter. Forage digestibility and energy content were used to project potential milk yield (pounds of milk/ton of dry matter). Expected milk yield per acre was calculated by multiplying the potential milk per ton of dry matter by the tons of dry matter per acre. This serves as another measure of productivity of each hybrid. Both yield (30% DM) and expected milk yield results are shown in Table 1.

Analysis of variance showed that there were significant differences among the hybrids tested for both yield ($p<0.0001$) and expected milk yield ($p<0.0001$). In Table 1, hybrids followed by the same letter are statistically similar (Tukey's HSD).

There was a statistically significant linear correlation between relative maturity and yield (30% dry matter) ($p=0.031$), but not between relative maturity and expected milk yield ($p=0.6248$).

Quality

Tables 1 and 2 lists select quality results for the 2018 trial.

Dry matter decreased as relative maturity increased. There was a significant linear effect with $p<0.0001$. At harvest time, most varieties were below optimum dry matter.

One way to select high-performing hybrids is to identify those that have both high crop yield and high milk yield (estimated pounds of milk per ton of dry matter). Within an experiment, we can compare hybrids by looking at their relative yields. Relative yields can be calculated by dividing a hybrid's yield by the average yield of the whole experiment. Those hybrids with relative yields greater than 100% performed better than average, while those with relative yields less than 100% performed worse than average for the experiment. Figure 1 shows the relative crop yield and relative milk yield. Hybrids that yield better than average for both parameters are in the upper right quadrant of the graph.

Conclusion

Warm temperatures made 2018 a good growing season at this site, despite somewhat reduced rainfall. One again, in 2018 there was a significant linear relationship between relative maturity and yield corrected to 30% dry matter. This relationship has been significant but weak (low r^2) in eight of the eleven years data was collected from the replicated trial (no calculations in 2016 due to herbicide damage). This relationship amounts to an increase of 0.62 – 2 tons per acre yield for every 10-day increase in relative maturity (Table 3). Table 3 also lists the results of linear regressions between relative maturity and expected milk yield since 2007. There has been a positive (though weak) linear relationship between relative maturity and expected milk yield in six of nine years, with an increase of 85 – 3280 pounds per acre of milk expected for each 10-day increase in relative maturity.

Shorter season hybrids offer options for improved cover crop establishment and the potential for double cropping. Although they may be slightly less productive in some growing seasons, this additional crop flexibility can significantly improve the total yield of digestible nutrients per acre. There is risk associated with choosing longer season hybrids for higher yield. Yield responses to longer maturity was greatest in the highest growing degree years, and it tended to be lower or not present under average growing conditions. By choosing short-season or mid-season varieties, producers help to guarantee a level of maturity and dry matter that produces quality corn silage that ferments well in the silo. They become less vulnerable to late wet harvest years. This also opens the door for improved nutrient and soil management options such as cover cropping.

In most years, earlier-maturing hybrids showed optimum or close to optimum dry matter content at harvest time. Later-maturing hybrids tend to show somewhat lower than recommended dry matter content at harvest. In 2018, most hybrids had dry matter below the optimum level of 30-34%, likely due to the early harvest. Once again, there was a significant linear relationship between relative maturity and dry matter, with later-maturing hybrids having lower dry matter at harvest.

ACKNOWLEDGEMENTS

We would like to thank John Stoughton and the farm crew at Misty Meadows Farm for their help with planting, crop management, and harvest. We also thank Barney Wright and the Wright Place farm crew for lending a planter in the spring and a weigh wagon and driver for harvest time. Thanks are also extended to the seed dealers who helped with seed donation, planting, and harvesting and to staff and students who helped in the field and in the office.

Table 1. Yield and estimated milk yield, 2018 Maine corn silage hybrid trial.

Hybrid number	Hybrid name	Relative Maturity	Yield (tons/acre at 30% DM)*		Relative mean	Milk per Ton (lbs/ton)*		Relative Mean	Estimated milk (lbs/acre)*,**		Dry matter (%)*	
1	Augusta Seed A2345	95	26.5	abc	103.2	3052	a-d	97.7	24271	abc	28.90	c-i
2	Augusta Seed A2448	98	27.4	ab	106.5	3035	a-d	97.1	24914	abc	28.60	c-i
3	Augusta Seed A2843	93	24.7	bcd	96.3	3083	a-d	98.7	22898	abc	27.87	e-i
4	Channel 187-49 VT2 PRIB	87	26.2	a-d	101.9	3143	a-d	100.6	24657	abc	28.70	c-i
5	Channel 192-98	92	23.8	bcd	92.5	3244	abc	103.8	23088	abc	27.53	d-i
6	Channel 196-40 STX RIB	96	25.5	a-d	99.4	3169	abc	101.4	24315	abc	28.03	e-i
7	Channel 197-68 STX RIB	97	26.0	a-d	101.3	3093	a-d	99.0	24089	abc	27.20	f-i
8	Channel 197-90	97	27.8	ab	108.3	3110	a-d	99.6	25972	ab	26.87	ghi
9	Channel 198-98	98	29.4	a	114.5	3158	a-d	101.1	27851	a	28.40	d-i
10	Croplan 1925	79	25.2	a-d	98.2	3334	ab	106.7	25242	abc	33.83	ab
11	Croplan 2692	86	24.2	bcd	94.1	3235	abc	103.6	23457	abc	30.53	b-h
12	Croplan 2845	88	27.3	abc	106.1	3360	abc	107.6	27484	ab	32.06	a-g
13	Croplan 3240	93	26.6	abc	103.5	2864	bcd	91.7	22860	abc	27.67	e-i
14	Dairyland DiDF 3197RA	97	27.5	ab	106.9	3033	a-d	97.1	24986	abc	26.90	f-i
15	Dairyland HiDF 3290-9	90	25.2	a-d	98.0	3275	abc	104.9	24743	abc	29.00	c-i
16	DeKalb DKC32-12RIB	82	26.3	abc	102.4	3341	ab	107.0	26340	ab	33.10	abc
17	DeKalb DKC41-99RIB	91	25.5	a-d	99.2	3335	ab	106.8	25492	abc	29.37	b-i
18	DeKalb DKC45-07RIB	95	25.5	a-d	99.4	3061	a-d	98.0	23448	abc	27.33	f-i
19	Dyna-Gro 32VC56	92	24.6	bcd	95.7	3109	a-d	99.5	22980	abc	26.37	hi
20	Dyna-Gro 41SS71	101	26.2	a-d	101.8	3050	a-d	97.6	23946	abc	27.07	f-i
21	Dyna-Gro D28SS36 RIB	88	24.5	bcd	95.3	3389	a	108.5	24877	abc	29.63	b-i
22	DynaGro D25VC45	85	25.2	a-d	98.2	3314	ab	106.1	25166	abc	28.80	c-i
23	KingFisher KF 35C10	85	25.5	a-d	99.4	3179	abc	101.8	24346	abc	28.90	c-i
24	KingFisher KF 43C40	93	25.7	a-d	100.1	3188	abc	102.1	24585	abc	30.40	b-h
25	KingFisher KF 49C60	99	25.7	a-d	100.2	3222	abc	103.1	24907	abc	29.63	b-i
26	Master's Choice MCT 3891	88	22.2	cd	86.3	3204	a-d	102.6	21244	abc	30.46	b-i
27	Master's Choice MCT 4572	95	27.2	abc	106.0	3100	a-d	99.2	25325	abc	29.60	b-i
28	Master's Choice MCT 4934	99	24.8	bcd	96.6	2869	bcd	91.8	21366	bc	26.57	hi
29	Mycogen BMR97B37 RA	97	25.1	a-d	97.8	3357	ab	107.5	25277	abc	25.90	hi
30	Mycogen TMF2Q419	96	27.6	ab	107.3	3110	a-d	99.6	25755	abc	26.73	hi
31	Mycogen TMF2R197		27.9	ab	108.4	3097	a-d	99.2	25886	abc	30.61	b-i
32	Mycogen TMF81S81	81	25.6	a-d	99.6	2939	a-d	94.1	22575	abc	36.27	a
33	Mycogen TMF83y26	83	25.4	a-d	98.9	3176	abc	101.7	24221	abc	32.13	a-e
34	Pioneer P9329AM	93	27.9	ab	108.6	3123	a-d	100.0	26124	ab	31.57	b-f
35	Pioneer P9789AMXT	97	25.6	a-d	99.6	3044	a-d	97.5	23421	abc	27.83	e-i

Hybrid number	Hybrid name	Relative Maturity	Yield (tons/acre at 30% DM)		Relative mean		Milk per Ton (lbs/ton)		Relative Mean		Estimated milk (lbs/acre)			Dry matter (%)	
36	Schlessman 856 gt	85	25.8	a-d	100.4		3298	abc	105.6		25519	abc		32.73	a-d
37	Schlessman 861lfy GT3111	86	25.0	a-d	97.2		2664	d	85.3		19869	c		26.37	hi
38	Schlessman 908 dp	90	24.6	bcd	95.9		3018	a-d	96.6		22298	abc		27.60	e-i
39	Schlessman 942 lfy gt3111	94	26.1	a-d	101.7		2869	bcd	91.8		22474	abc		25.60	i
40	Seedway SW 2754 RR	86	25.1	a-d	97.7		2808	cd	89.9		21175	bc		26.83	ghi
41	Seedway SW 3654 RR	91	24.4	bcd	94.8		3046	a-d	97.5		22288	abc		27.87	e-i
42	Seedway SW 3854 RR	94	24.8	bcd	96.4		2991	a-d	95.7		22259	abc		27.20	f-i
43	Seedway SW 3937 bmr	94	21.7	d	84.4		3228	abc	103.3		21095	bc		28.37	d-i

*Means followed by the same letter are not statistically different (Tukey's HSD).

** Expected milk yield is calculated by multiplying the dry matter yield by the calculated milk lbs/ton. Calculated milk lbs/ton is a projection of potential milk yield per ton of forage dry matter, based on forage digestibility and energy content.

Table 2. Select quality results, 2018 Maine corn silage hybrid trial.

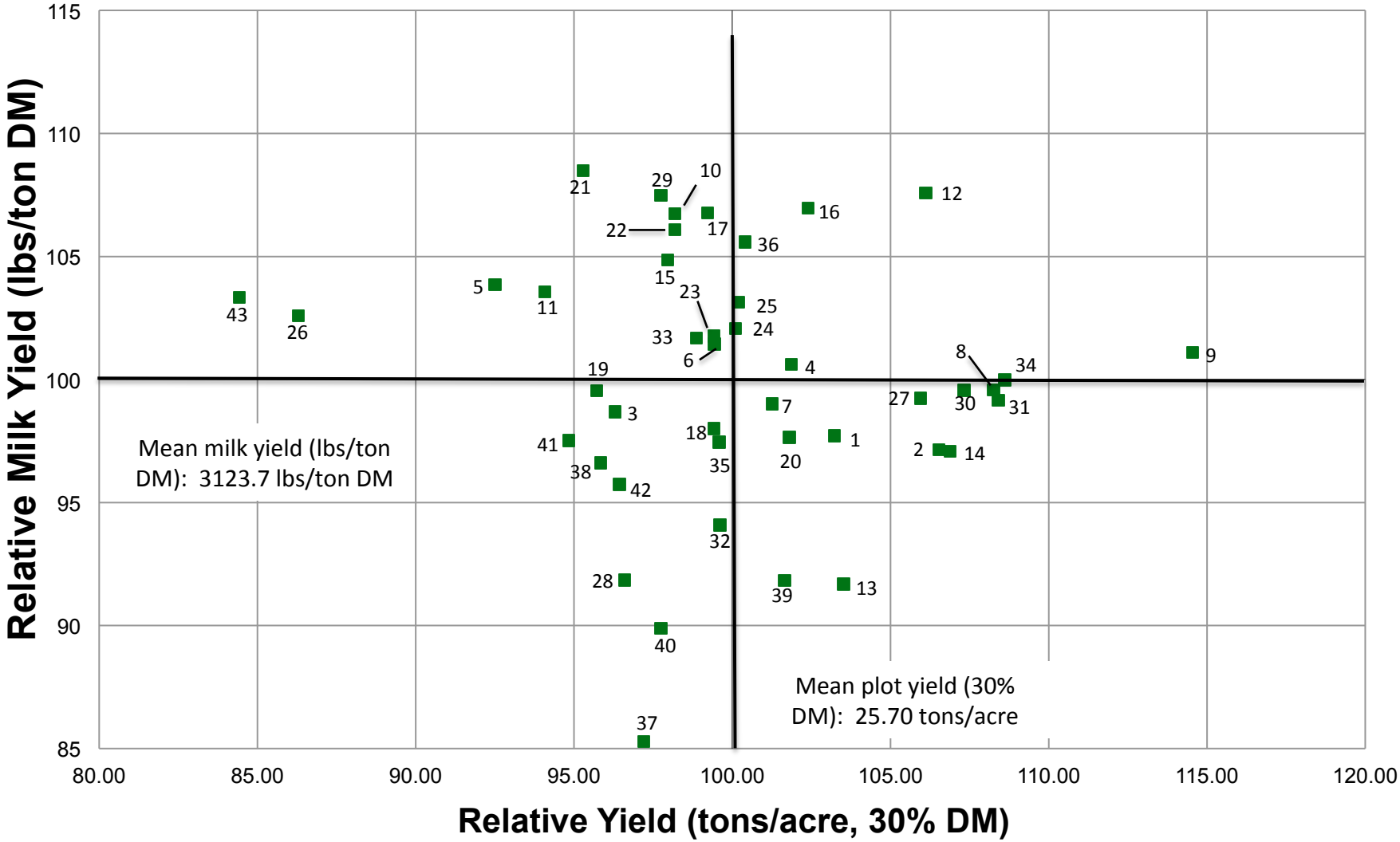
Hybrid number	Hybrid name	Relative Maturity	Crude Protein (%DM)	ADF (%DM)	aNDF (%DM)	aNDFom (%DM)	Ethanol-soluble CHO (%DM)	Starch (%DM)	Net Energy Lactation (Mcal/lb)	NDF Dig. (30hr) (%NDF)
1	Augusta Seed A2345	95	7.60	24.90	40.93	40.23	7.90	29.80	0.7467	51.67
2	Augusta Seed A2448	98	7.50	25.17	40.10	39.03	7.97	30.20	0.7467	50.03
3	Augusta Seed A2843	93	8.43	23.77	38.50	37.57	7.23	31.27	0.7500	48.97
4	Channel 187-49 VT2 PRIB	87	7.67	24.67	40.40	39.47	7.77	29.97	0.7533	54.37
5	Channel 192-98	92	8.30	24.65	40.95	40.30	5.95	31.05	0.7450	54.21
6	Channel 196-40 STX RIB	96	7.30	25.70	41.37	40.23	6.93	30.30	0.7367	55.37
7	Channel 197-68 STX RIB	97	7.97	24.87	40.47	39.23	8.33	28.03	0.7433	58.33
8	Channel 197-90	97	7.67	25.07	39.63	38.50	7.20	30.70	0.7467	51.70
9	Channel 198-98	98	7.70	23.60	38.43	37.23	8.00	31.43	0.7600	54.40
10	Croplan 1925	79	8.23	22.47	38.37	37.83	5.83	33.83	0.7600	54.37
11	Croplan 2692	86	7.87	24.53	40.73	39.87	6.47	31.10	0.7467	56.00
12	Croplan 2845	88	7.15	24.35	40.40	39.75	5.95	33.30	0.7550	52.86
13	Croplan 3240	93	8.47	24.67	40.03	38.93	9.47	27.27	0.7467	50.90
14	Dairyland DiDF 3197RA	97	7.60	26.73	42.70	41.70	7.30	27.33	0.7333	55.30
15	Dairyland HiDF 3290-9	90	7.57	24.80	39.63	38.97	5.20	33.57	0.7467	51.27
16	DeKalb DKC32-12RIB	82	8.00	22.93	38.70	38.13	6.37	33.27	0.7567	57.10
17	DeKalb DKC41-99RIB	91	7.73	23.20	37.87	36.80	6.53	34.10	0.7633	53.10
18	DeKalb DKC45-07RIB	95	7.73	26.73	42.80	41.70	6.67	27.80	0.7267	55.03
19	Dyna-Gro 32VC56	92	7.30	26.17	42.43	41.57	7.37	28.27	0.7400	55.47
20	Dyna-Gro 41SS71	101	7.73	25.20	40.97	39.90	7.87	28.93	0.7433	54.90
21	Dyna-Gro D28SS36 RIB	88	7.90	22.27	37.00	35.97	5.90	34.93	0.7633	53.87
22	DynaGro D25VC45	85	7.73	24.40	39.30	38.57	4.50	34.17	0.7533	52.50
23	KingFisher KF 35C10	85	8.13	24.57	39.70	38.77	6.10	31.57	0.7467	52.57
24	KingFisher KF 43C40	93	8.13	23.00	37.93	37.20	7.60	32.30	0.7600	51.13
25	KingFisher KF 49C60	99	7.90	24.90	41.10	40.10	7.13	29.17	0.7500	58.97
26	Master's Choice MCT 3891	88	7.55	27.15	44.10	43.45	5.45	28.75	0.7300	54.11
27	Master's Choice MCT 4572	95	7.80	24.30	39.27	38.27	7.43	31.13	0.7500	51.07
28	Master's Choice MCT 4934	99	8.27	24.67	39.50	38.03	9.93	27.70	0.7467	52.53
29	Mycogen BMR97B37 RA	97	8.13	22.63	37.67	36.53	8.87	30.57	0.7800	64.73
30	Mycogen TMF2Q419	96	7.93	26.17	42.20	41.10	6.53	28.30	0.7400	55.87
31	Mycogen TMF2R197		7.60	24.95	40.55	39.95	7.00	30.35	0.7450	51.23
32	Mycogen TMF81S81	81	7.47	25.57	42.60	41.97	4.07	32.73	0.7367	50.17
33	Mycogen TMF83y26	83	7.50	25.40	41.77	41.10	5.67	31.07	0.7400	53.23
34	Pioneer P9329AM	93	7.53	26.00	43.07	42.37	5.90	29.90	0.7367	52.93
35	Pioneer P9789AMXT	97	7.73	27.27	43.97	43.13	5.70	28.33	0.7200	53.73

Hybrid number	Hybrid name	Relative Maturity	Crude Protein (%DM)	ADF (%DM)	aNDF (%DM)	aNDFom (%DM)	Ethanol-soluble CHO (%DM)	Starch (%DM)	Net Energy Lactation (Mcal/lb)	NDF Dig. (30hr) (%NDF)
36	Schlessman 856 gt	85	7.77	23.70	39.53	38.90	5.13	34.03	0.7567	52.37
37	Schlessman 861lfy GT3111	86	8.67	28.07	45.67	44.63	9.70	20.47	0.7167	54.07
38	Schlessman 908 dp	90	7.93	26.20	42.50	41.80	6.47	28.37	0.7300	50.77
39	Schlessman 942 lfy gt3111	94	7.93	28.70	45.83	45.03	6.07	25.00	0.7033	51.57
40	Seedway SW 2754 RR	86	8.13	27.50	44.20	43.27	8.37	24.47	0.7200	52.10
41	Seedway SW 3654 RR	91	8.13	26.27	42.83	42.03	6.57	28.17	0.7267	54.93
42	Seedway SW 3854 RR	94	7.60	25.60	41.03	40.10	8.10	28.70	0.7467	51.17
43	Seedway SW 3937 bmr	94	8.07	24.80	41.30	40.43	8.03	28.03	0.7500	62.13

Table 3. Growing degree days, and increase in yield (30% dry matter) and expected milk yield for each 10 days increase in relative maturity as estimated by linear regression, Maine corn silage hybrid trial, 2007-2018.

	Location	Growing degree days (86/50)	Tons/acre yield (30% DM) increase per 10 days maturity	Pounds/acre milk yield increase per 10 days maturity
2007	Clinton	2086	1.1	Not calculated
2008	Clinton	1840	0.97	Not calculated
2009	Leeds	1908	No relationship	91
2010	Leeds	2120	1.9	2890
2011	Clinton	2287	2	3280
2012	Clinton	2160	1.1	1480
2013	Clinton	2027	No relationship	No relationship
2014	Clinton	1933	No relationship	No relationship
2015	Clinton	2347	1.08	2790
2016	Clinton	2082	Not calculated	Not calculated
2017	Clinton	2035	1.7	85
2018	Clinton	2004	0.62	No relationship

Figure 1. Relative Yield and Quality



Contacts for corn hybrids in 2018 trial

Company	Contact	Phone	Email	Axis	Channel	Croplan	DeKalb	Dynagro	Master's Choice	Mycogen	NK	Pioneer	Schlessman	Seedway
AgMatters LLC	Lauchlin Titus	207.314.2655	lauchlin@agmattersllc.com								x			x
Axis NE, LLC	Tim Taylor	315.374.2611 (M)	timaxisne@gmail.com	x										
Winslow Agriculture, LLC	Alvin Winslow	207.330.5378	alvin.winslow@outlook.com		x									
Crop Production Services (Office: 207.764.1860)	Brian McCleary	207.740.1911 (M)	brian.mccleary@cpsagu.com				x	x		x	x			
	Franklin Leavitt	207.944.1922 (M)	Franklin.Leavitt@cpsagu.com				x	x		x	x			
	Randy Drown	207.650.0310 (M)	randy.drown@cpsagu.com				x	x		x	x			
	Todd Winslow	207.551.6806 (M)	todd.winslow@cpsagu.com				x	x		x	x			
Fedco Seeds	Alice Percy	207.426.8247	alice@fedcoseeds.com						x					
Feed Commodities International	Al Fortin	207.341.0968 800.462.4929	afortin@feedcommodities.com								x			x
	Patricia Henderson	207.487.1076	phenderson@feedcommodities.com								x			x
Gold Star Feed and Grain, LLC	Michele Bennett	207.754.0764	mbennett@goldstarfeed.com								x		x	x
	Emilee Robertson	207.399.6755	erobertson@goldstarfeed.com								x		x	x
	Andy Dugan	315.841.4167	adugan@goldstarfeed.com										x	
	R. Keith Hines		abhines@msn.com						x					
	Warren Hood	207.754.1853 (M)	hoodlah@aol.com							x				
Kent Nutrition Group	Nick Richardson	207.317.0469	nicholas.richardson@blueseal.com										x	
King's Agriseeds, Inc.	Rod Porter	607.227.0836	rodporter@kingsagriseeds.com						x					
Master's Choice	Kyle Vosburgh	618.697.7031	kyle@seedcorn.com						x					
	Nick Michaud	207.649.9786								x				
Mycogen	Claude Fortin, area mgr	802.363.2803								x				
Northeast Agricultural Sales (Office: 800.462.7672)	Justin Choiniere	802.535.9938 (M)	justin@neag.net			x	x				x			x
	Paul Peters	207.441.6250 (M)	pumpkinpaul1@aol.com			x	x				x			x
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	Scott Soucy	207.933.2109	ssoucy@seedway.com								x			x
Syngenta/NK	Brendan Evans	607.302.0646	Brendan.evans@syngenta.com								x			
Winfield United	Klaus Busch	518.545.8094	kbusch@landolakes.com			x								