2010 Corn Hybrid Evaluation in Massachusetts

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Rationale:

Each year farmers in Massachusetts seek information about corn hybrid varieties that are best suited for their needs, as either as silage or grain. The UMass Extension's Crops, Dairy, Livestock, and Equine Team provides research-based results on commercially available corn hybrids for farmers to make an informed decision on hybrid selection. This service is provided annually to farmers across the state and reports are published through the team's newsletter, and distributed through local and state agencies.

Research Goals:

In Massachusetts we are encouraging farmers to use shorter season corn hybrids along with earlier planting so that together, these two management practices can provide the opportunity for early planting of cover crops, which maximizes N recovery after corn and fall manure application. Our multi-year research studies have shown that well-established cover crops, planted by September 1st (achieving 1100 GDDs) can accumulate more than 100 lb nitrogen (N) per acre. Cover cropping helps to decrease the potential for N leaching and promotes good soil health by providing organic matter and nutrients to the soil when the cover crop is turned under in the spring.

Corn silage hybrids were evaluated for silage yield performance at the University of Massachusetts Crops and Animal Research and Education Farm, in South Deerfield, Massachusetts in 2010. Hybrids were grouped in three groups based on relative maturity (RM) provided by the seed companies; Group I, early maturity group (85-94 days), group II mid maturity group (95-100 days), and group III, full season group (101-115 days).

Treatments:

All hybrids were planted on May 6th. A cone type distributor mounted on a double disc opening corn planter was used in a conventionally prepared seedbed. Plots were planted at the rate of 33,000 seeds per acre in 30-inch rows. Plots consisted of 3 rows with a length of 50 feet and replicated 4 times. The site received 660 lb/acre of 15-8-12 fertilizer prior to planting. A pre-sidedress nitrate test (PSNT) taken on June 15th indicated that a sufficient level of nitrogen existed on the research site and therefore no sidedress N was applied. Weeds were controlled by Bicep II, a pre-emergence herbicide applied at a rate of 2 quarts per acre.

Ten feet of the central row, from each hybrid plot was harvested by hand at 50% milk line for evaluation of silage yield. Group I hybrids were harvested on August 30th and Groups II and III were harvested 4 days later on September 3rd, which compared to the norm for this location is considered early. The early harvesting of groups II and III was mainly due to the relatively dry condition that occurred during the month of August with only 1.72" precipitation compared to the norm in this location which is 4.10" (Table 1). Harvested hybrids were evaluated for silage and ear yield, percentage ears, and moisture

content. Silage yield was adjusted to 70% moisture and ear corn yield to 25% moisture.

Results:

Climate data for evaluation site is presented in Table 1. In 2010 the corn crop experienced drier condition especially in August, which coincides with grain filling stage. The late dry condition had less negative impact on shorter-season hybrids compared to full-season hybrids. As a result, the shorter-season maturity hybrids in general performed better compared to full-season maturity groups. Shorter-season hybrids produced about 5% higher percent ear, which can be translated as higher silage quality. Our past evaluations in 2007-2009 indicated when corn is planted for grain production, the late maturity hybrids most often out yielded shorter-season hybrids. In 2010, as mentioned above, due to dry conditions that occurred during grain filling stage, shorter-season hybrids in average performed as good as the mid and late maturity groups.

Summary of mean comparison of silage and grain yield, ear %, and grain moisture content for the three maturity group hybrids are shown in Table 2. The results of silage and grain yield, ear percentage, grain moisture, and silking date for all hybrids tested in 2010 are presented in Table 3.

Table 1: Climate data for 2010 in South Deerfield, MA.

	GDD[1]			Rainfall (inches)		
	2010	Norm	Deviation	2010	Norm	Deviation
May (25 days)	286	253	33	2.07	3.79	- 1.72
Jun	568	533	35	3.90	3.75	+ 0.15
Jul	741	697	44	4.13	3.91	+ 0.22
Aug	635	638	- 3	1.72	4.10	- 2.38
Total	**2230**	**2121**	**109**	**11.82**	**15.55**	**- 3.73**

[1] Growing Degree Days was calculated as: GDD = ∑ $(T_{max} + T_{min})/2$ B 50

Table 2: Mean comparisons of silage and grain yield, ear %, and grain moisture, for three maturity group hybrids planted on May 6th, 2010 and harvested at 50% milk line (for silage) and about 20% grain moisture for grain production.

Maturity	Silage[1] T/ac	Earcorn[2] T/ac	Pctear %	Grain Bu/ac[3]	Grain moisture	Cob/Ear %	Silk Date DAP[4]
Group I	29.4ab[†]	7.3a	62.3a	189.3a	18.2b	11.7a	69.4c
Group II	28.3b	6.8b	59.8b	185.6a	20.3a	10.6b	71.3b
Group III	30.4a	7.0b	57.1c	182.3a	20.6a	11.4a	73.9 a

[1]Silage @70% moisture [2]Earcorn @ 25% moisture [3]grain @ 15.5% moisture
[4]Days After Planting
[†] Means with the same letter within each column are not significantly different at *P ≤ 0.05*.

Table 3: Grain yield, grain moisture at harvest, and cob/ear ratio for three maturity group hybrids planted on May 6th, 2010 and harvested at about 20% grain moisture production.

Brand	Hybrid	Maturity group	silage T/ac	earcorn T/ac	pctear %	silk DAP
TA Seeds	TA290-11 (CB/LL)	I	29.5	7.7	65	67
Dairyland	ST-9789 (RR)	I	30.0	7.7	64	70
Agrisure (NK)	N20R-GT	I	28.6	6.6	58	72
Mean			**29.4**	**7.3**	**62.3**	**69.4**
TA Seeds	TA501-161	II	30.3	6.5	53	76
Dairyland	ST-3195Q (RR)	II	27.8	6.3	56	74
DEKALB	DKC 46-07	II	28.2	7.3	66	71
DEKALB	DKC 46-6	II	26.0	6.1	58	69
DEKALB	DKC 49-94	II	27.8	6.5	58	73
DEKALB	DKC 45-52	II	30.1	7.8	65	67
DEKALB	DKC 48-37	II	27.8	6.9	62	70
Mean			**28.3**	**6.8**	**59.8**	**71.3**
TA Seeds	TA788-13 (YGVT3)	III	28.2	6.3	56	72
Dairyland	ST- 9703Q	III	29.2	6.4	54	74
DEKALB	DKC 52-59 (VT3)	III	26.9	6.5	60	75
DEKALB	DKC 54-16 (VT3)	III	31.8	7.6	59	75
DEKALB	DKC 57-50 (VT3)	III	29.5	6.7	56	75
DEKALB	DKC 59-64	III	33.3	7.2	54	75
DEKALB	DKC 61-69	III	32.4	7.3	56	74
DEKALB	DKC 63-42	III	32.2	7.2	56	75
DEKALB	DKC 63-84	III	32.0	7.1	55	77
DEKALB	DKC 50-35	III	28.0	7.2	64	68
Mean			**30.4**	**7.0**	**57.1**	**73.9**
Overall Mean			**29.4**	**7.0**	**59.7**	**71.5**
CV (%)			12.3	14.3	4.6	3.4

[1]Silage @70% moisture [2]Earcorn @ 25% moisture

For more information about this research project contact Masoud Hashemi, masoud@psis.umass.edu.