

Evaluation of Corn Hybrids in Massachusetts

Stephen J. Herbert and Masoud Hashemi
Department of Plant, Soil, and Insect Sciences

In 2007 we grouped the corn hybrids submitted by contributing companies into 3 maturity groups; group I 90-97 days, group II 98-105 days, and group III > 106 days. Five years of field studies (2002 to 2006) at the University of Massachusetts Crops Research and Education Center farm had shown that earlier maturing corn hybrids had a similar yield to later maturing hybrids. Further, in some of our studies the early maturing hybrids performed better in terms of the proportion of grain to stover than later maturing hybrids. If confirmed, this will demonstrate the benefit of planting earlier hybrids for integration with early planted cover crops for end-of-season N uptake. However, field studies on several farms across the Commonwealth are needed to confirm this finding.

All hybrids in this evaluation were planted on April 26, 2007 in the Connecticut River Valley at the University of Massachusetts Crops Research and Education Center Farm in South Deerfield. A cone type distributor mounted on a double disc opening corn planter was used in a conventionally prepared seed bed. Each plot was planted at the rate of 32,000 seeds per acre in 30 inch rows. Plots consisted of 3 rows with a length of 25 feet. Each hybrid was replicated 4 times. Weeds were controlled with a pre-emergence application of 2 quarts of Bicep II Magnum per acre, and fertilized with 650 lbs/ac of 15-8-12 fertilizer applied pre-plant, and a further 100 lb/acre of calcium ammonium nitrate side dressed on July 9.

Corn hybrids were harvested by hand at different dates when their kernels reached 50% milk line. Harvested hybrids were evaluated for yield of silage and ears, percentage ears, and moisture content. Ten feet of the central row from each plot was taken for yield estimation. Silage yields were adjusted to 70% moisture and ear corn yields to 25% moisture. Moisture content is reported as percentage of corn harvested as silage.

Growing season conditions in 2007 for all maturity groups hybrids was significantly different compared to 2006 and the norm for this location. In 2007, crops experienced cooler and especially dryer conditions in their early growth stages compared to the previous season and the norm condition (Table 1). For example, during the first two months after planting, corn plants had 137, and 86 fewer growing degree days compared to 2006 and the norm condition, respectively. Moreover, during the early growth stages, noticeably in months of May and June, corn plants received significantly less rainfall (6.18 inch) than in 2006 (14.79 inch), and normal condition (8.44 inch). August rainfall was also much less than the norm.

Results obtained in 2007 indicated that silage yield of all three maturity group hybrids were not statistically different (Table 2). However, the 2007 results in terms of grain to stover ratio were not consistent with our earlier findings. Hybrids in the late and medium maturity groups had 11% and 5% higher ear percentage than early maturity hybrids, respectively (Table 3). This in part, could be attributed to the cooler and dryer conditions existed during the early stages of the crop growth. Further research which includes a greater number of hybrids as well as evaluation at varied locations is required for more definite conclusions.

Results of these trials are made available to farmers, extension agents, seed distributors, seed salesmen and others upon request. Tables should not be reproduced if any portion is omitted, or if order of data is changed.

Table 1: Climate data for 2007, 2006 and norm in South Deerfield, Massachusetts.

	<u>GDD¹</u>			<u>Rainfall (inches)</u>		
	2007	2006	Norm	2007	2006	Norm
Apr	7	0	10	0.83	0	0.80
May	284	291	282	2.76	6.37	3.89
Jun	448	585	533	2.59	8.42	3.75
Jul	628	773	697	5.50	2.08	3.91
Aug	711	550	638	1.12	1.42	4.10
Sep	195	323	381	1.62	1.83	3.79
Total	2273²	2522	2541	14.42³	20.12	20.24

¹ Growing Degree Days was calculated as: $GDD = \Sigma(T_{max} + T_{min})/2 - 50$

² Total GDD for maturity group III. Total for groups I & II were 2078 and 2173, respectively.

³ Total rainfall for maturity group III. Total for I & II was 12.8 inches.

Table 2: Mean comparison of silage yield, ear yield, plant moist%, ear moist% and ear percentage for 3 maturity groups used in 2007 hybrids trial, planted on April 26, 2007 And harvested at 50% milk line.

Maturity group comparison	Silage	Earcorn	Moisture	Ear moist	Ear/grain
III vs II	NS	**	NS	NS	**
III vs I	NS	**	**	**	**
II vs I	NS	NS	**	**	**

Table 3: Yield, moist%, and ear percentage for all hybrids planted on April 26, 2007 harvested at 50% milk line.

BRAND	HYBRID	Maturity Group	silage ¹ T/ac	moist %	earcorn ² T/ac	emoist %	pctear %
DEKALB	DKC 45-82	I	28.9	64.9	7.0	46.7	60.7
DEKALB	DKC 46-60	I	28.6	66.1	6.7	48.9	59.5
Seedway	3000RRYG	I	28.9	65.7	6.3	46.3	55.0
Seedway	SW 3301L	I	29.6	67.2	6.8	47.4	57.4
Blue Seal	946L	I	30.0	64.8	6.7	49.2	55.6
Blue Seal	996L	I	27.7	64.1	6.2	48.4	57.1
Mean			29.0	65.5	6.6	47.8	57.6
DEKALB	DKC 50-48	II	28.1	62.9	6.2	46.5	61.8
DEKALB	DKC 55-12	II	32.6	64.5	7.9	45.8	60.7
DEKALB	DKC 54-46	II	27.7	62.1	6.6	41.4	59.3
DEKALB	DKC 48-46	II	30.8	65.0	7.9	45.6	63.7
DEKALB	DKC 52-63	II	30.6	65.0	7.6	47.2	62.0
Blue Seal	986GS	II	27.0	63.7	7.0	44.9	65.1
Blue Seal	1046L	II	35.1	65.5	7.6	45.4	53.8
Blue Seal	1051L	II	30.0	63.3	6.9	44.8	58.3
Mean			30.2	64.0	7.2	45.2	60.6
T.A. Seeds	TA 570-11	III	30.7	62.0	7.9	43.8	64.2
T.A. Seeds	TA 607-11	III	29.1	62.5	7.7	44.2	66.2
T.A. Seeds	TA 678-13	III	32.5	67.1	7.8	47.4	59.8
DEKALB	DKC 57-47	III	29.8	61.9	7.9	43.7	66.9
DEKALB	DKC 61-22	III	30.8	63.9	8.2	43.0	64.1
DEKALB	DKC 63-42	III	31.9	63.9	8.1	45.1	63.9
DEKALB	DKC 61-66	III	31.0	64.0	7.8	46.2	62.9
Mean			30.8	63.6	7.9	44.8	64.0
Overall Mean			30.2	64.2	7.3	45.8	60.7
CV (%)			12.0	4.2	12.3	7.0	6.1

¹Silage @70% moisture

²Earcorn @ 25% moisture