2024

Professional Dairy Managers of Pennsylvania (PDMP)

Corn Silage Hybrid Performance Trial Results

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Production Details: Penn State/PDMP Corn Silage Hybrid Evaluation Trials

Site:	Pennsylvania Furance, PA
Cooperator	Penn State Agronomy Farm
Planting Date	6/3/2024
Soil Type	Hagerstown silt loam
Herbicides pre-	1 qt/ac Roundup, 1 oz/ac Sharpen
post-	2.1 qt/ac Storen, 1 qt/ac Atrazine, 1 qt/ac Roundup
Previous Crop	Soybeans
Tillage	None
Starter Fertilizer	15 gal UAN
Insecticide	
Manure	
Fertilizer	40 gal UAN
Harvest Date	10/7/2024

Field Summary:

Emergence and stand was good. Weed control was excellent. There was some tar spot and gray leaf spot at harvest, but nothing yield limiting. Two weeks of cool wet weather mid-September pushed back harvest and crop moistures are a bit drier then what's ideal.

Weather Summary:

Month	Precip. In.	GDD
June 3-June 30	2.20	550
July	4.70	715
August	8.30	588
September	2.20	389
October 1-7	0.90	43
Seasonal Total	**18.30**	**2285**

Precip. Data: https://climate.com

GDD data: http://climatesmartfarming.org/tools/csf-growing-degree-day-calculator/

PDMP Corn Silage Hybrid Testing Program 2024

PDMP Professional Dairy Managers of Pennsylvania

in collaboration with

PennState Extension College of Agricultural Sciences

Early maturity (91-103) day RM silage hybrids in Pennsylvania Furance, PA

Notes: SEE BACKGROUND TAB

Cooperator: Penn State Agronomy Research Farm

Brand	Hybrid	Traits[1]	Relative Maturity	Pop. Plants/ac	Dry Matter %[2]	Crude Protein %DM	Lignin %DM	Ash %DM	Starch %DM	TFA %DM	NDFom %DM	uNDF 240 hr %DM	NDFD 30 %NDF	IVSD %Starch[3]	Fresh Yield tons/ac[4]	OM Yield tons/ac[5]	DOM Yield tons/ac[6]	OMD %[7]
91-97 day hybrids																		
Mid-Atlantic	MA5941	0	94	34,000	47.1	7.6	1.9	2.5	48.9	2.8	28.7	8.0	56.2	63.6	19.5	6.6	4.2	63.6
Revere Seed	096-DV48	15	96	33,667	46.9	7.2	2.0	2.4	51.1	2.7	28.3	7.7	55.6	64.5	18.4	6.3	4.0	63.8
Mid-Atlantic	MA5962DV	15	96	33,000	46.1	7.3	2.2	2.9	44.7	2.6	33.5	9.1	56.8	62.1	17.8	6.1	3.8	62.5
Revere Seed	X091-X42	32	91	33,833	45.9	7.6	2.0	2.6	48.4	2.9	29.6	8.0	57.1	62.2	18.6	6.4	4.0	63.0
Channel	195-40VT4PRIB	46	95	34,000	45.0	7.0	2.1	2.4	48.2	2.7	30.8	8.1	58.5	64.8	21.6	7.4	4.8	64.7
Channel	197-99SSPRIB	35	97	34,000	45.0	6.8	1.9	2.1	49.1	2.9	29.5	7.3	60.0	65.3	19.8	6.8	4.4	65.6
Seed Consultants	SC964PCE	25	96	34,000	44.3	6.8	1.8	2.3	51.1	2.8	27.9	6.6	60.5	65.7	19.1	6.5	4.3	66.1
Chemgro	5644PCE	27	96	34,000	44.1	7.2	2.1	2.5	49.0	2.6	28.8	7.9	55.8	64.9	21.3	7.3	4.7	64.1
Channel	193-42VT4PRIB	46	93	34,000	43.6	6.5	2.1	2.4	44.5	2.6	34.8	8.8	59.6	64.8	21.3	7.3	4.7	64.7
				91-97 day means	***45.3***	***7.1***	***2.0***	***2.5***	***48.3***	***2.7***	***30.2***	***7.9***	***57.8***	***64.2***	***19.7***	***6.7***	***4.3***	***64.2***
98-103 day hybrids																		
Syngenta NK	NK0252-DV	15	102	34,000	44.6	8.3	2.1	3.0	46.7	2.8	28.7	8.7	54.6	62.7	19.1	6.5	4.1	62.7
Mid-Atlantic	MA5005DV	15	100	34,000	44.1	7.2	2.0	2.4	46.3	2.8	32.1	8.1	60.6	64.2	20.0	6.8	4.4	65.0
Syngenta NK	NK9805-DV	15	98	33,500	44.0	7.1	2.1	2.6	45.6	2.6	32.7	9.2	56.6	64.1	17.1	5.8	3.7	63.5
Revere Seed	9827 SSX	32	98	34,000	43.4	7.6	2.1	2.5	46.7	2.8	31.1	8.4	57.0	62.0	18.7	6.4	4.0	62.8
Dekalb	DKC098-55RIB	32	98	34,000	42.9	7.1	1.9	2.3	46.3	2.7	31.1	7.7	60.6	64.8	19.7	6.7	4.4	65.5
Growmark FS	INVISION FS 4845P F	35	98	34,000	42.3	7.5	2.1	2.8	46.3	2.6	30.4	8.2	57.3	65.1	19.8	6.7	4.4	64.6
Revere Seed	101-P47	43	101	34,000	40.9	7.3	2.0	2.4	48.1	2.7	29.3	6.8	61.2	65.2	18.6	6.4	4.2	66.0
Mid-Atlantic	MA6032PCE	27	103	34,000	39.9	7.2	1.9	2.5	47.4	2.9	30.4	8.0	58.8	65.0	19.7	6.7	4.4	65.0
Mid-Atlantic	MA6029PCE	27	102	34,000	39.6	7.3	1.7	2.6	46.6	2.7	29.8	6.4	64.1	65.6	20.0	6.8	4.6	67.1
Channel	198-99SSPRIB	35	98	34,000	39.5	7.1	2.1	2.4	45.0	2.7	31.4	8.8	56.9	65.3	19.4	6.6	4.3	64.3
Seed Consultants	SC1018AM	1	101	34,000	39.1	7.6	1.9	2.5	45.3	2.6	30.9	7.5	61.3	65.4	19.6	6.7	4.4	66.1
`				***98-103 day means***	***43.4***	***7.3***	***2.0***	***2.5***	***47.3***	***2.7***	***30.5***	***8.0***	***58.5***	***64.4***	***19.5***	***6.6***	***4.3***	***64.5***
				Overall Mean	**43.4**	**7.3**	**2.0**	**2.5**	**47.3**	**2.7**	**30.5**	**8.0**	**58.5**	**64.4**	**19.5**	**6.6**	**4.3**	**64.5**
				LSD(0.1)	**2.7**	**0.3**	**NS**	**0.2**	**NS**	**NS**	**NS**	**1.3**	**2.3**	**0.9**	**NS**	**NS**	**0.5**	**1.1**
				CV%	**4.5**	**3.3**	**10.5**	**6.5**	**5.7**	**6.8**	**8.1**	**11.6**	**2.9**	**1.0**	**8.1**	**8.2**	**8.7**	**1.2**

[1] **Traits:** See tab " Trait Key" for individual trait designation.

[2] **Dry Matter:** Tables are sorted by dry matter. *Avoid making comparisons with hybrids that differ significantly in dry matter.*

[3] **IVSD:** Starch digestibiliy (% of starch) is analyzed by an NIRS method on samples ground through a 4-mm screen and incubated for 7 hours (IVSD).

[4] **Fresh Yield:** Silage yields are expressed on a 35 percent DM basis; all other parameters are expressed on a dry matter basis.

[5] **OM Yield:** Silage yield (tons/ac) expressed on an organic matter (OM) basis.

[6] **DOM Yield:** Yield of digestible organic matter.

[7] **OMD: Organic Matter Digestibility -** Please see "OMD Story" tab for information on how to use this column

NS = Not Significant

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Handy BT Trait Table - https://www.texasinsects.org/uploads/4/9/3/0/49304017/bttraittable_feb_2023.pdf

Trait ID #	Trait packages, listed A-Z = former name if applicable	Bag-Tag code	Toxins in package**** Font type denotes target Caterpillar or *rootworm*	BCW	CEW	ECB	FAW	SB	SCB	SWCB	TAW	WBC	CRW	Resistance cases for all Bts in package	Non-Bt refuge, cornbelt	Herbicide tolerance
0	Conventional															
1	AcreMax	AM	Cry1Ab - Cry1F	x	x	x	x	x	x	x				CEW FAW WBC	5% in bag	GLY LL
2	AcreMax CRW	AMRW	*Cry34Ab1 - Cry35Ab1*										x	NCR WCR	10% in bag	GLY LL
3	AcreMax1	AM1	Cry1F - *Cry34Ab1 - Cry35Ab1*	x		x	x	x	x	x			x	ECB FAW NCR SWCB WBC WCR	10% in bag 20% ECB	GLY LL
4	AcreMax Leptra	AML	Cry1Ab - Cry1F - Vip3A	x	x	x	x	x	x	x	x	x			5% in bag	GLY LL
5	AcreMax TRIsect	AMT	Cry1Ab - Cry1F - *mCry3A*	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	10% in bag	GLY LL
6	AcreMax Xtra	AMX	Cry1Ab - Cry1F - *Cry34Ab1 - Cry35Ab1*	x	x	x	x	x	x	x			x	CEW FAW NCR WBC WCR	10% in bag	GLY LL
7	AcreMax Xtreme	AMXT	Cry1Ab - Cry1F - *Cry34Ab1 - Cry35Ab1 - mCry3A*	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	5% in bag	GLY LL
8	Agrisure 3010	3010	Cry1Ab		x	x			x	x				CEW	20%	GLY LL
9	Agrisure 3000 GT & 3011A	3000GT 3011A	Cry1Ab - *mCry3A*		x	x			x	x			x	CEW WCR	20%	GLY LL
10	Agrisure Above = Agrisure 3120EZ	AA	Cry1Ab - Cry1F	x	x	x	x	x	x	x				CEW FAW WBC	5% in bag	GLY LL - check bag
11	Agrisure Total = Agrisure 3122EZ	AT	Cry1Ab - Cry1F - *Cry34Ab1 - Cry35Ab1 - mCry3A*	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	5% in bag	GLY LL - check bag
12	Agrisure Viptera 3110	3110	Cry1Ab - Vip3A	x	x	x	x	x	x	x	x	x			20%	GLY LL
13	Agrisure Viptera 3111	3111	Cry1Ab - Vip3A - *mCry3A*	x	x	x	x	x	x	x	x	x	x	WCR	20%	GLY LL
14	Duracade = AgrisureDuracade 5122EZ	D	Cry1Ab - Cry1F - *eCry3.1Ab - mCry3A*	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	5% in bag	GLY LL - check bag
15	Duracade Viptera = AgrisureDuracade 5222EZ	DV	Cry1Ab - Cry1F - Vip3A - *eCry3.1Ab - mCry3A*	x	x	x	x	x	x	x	x	x	x	WCR	5% in bag	GLY LL - check bag
16	Duracade Viptera Z3 = AgrisureDuracade 5332EZ	DVZ	Cry1Ab - Cry1A.105 - Cry2Ab2 - Vip3A - *eCry3.1Ab - mCry3A*	x	x	x	x	x	x	x	x	x	x	WCR	5% in bag	GLY LL - check bag
17	Herculex I	HXI	Cry1F	x		x	x	x	x	x				ECB FAW SWCB WBC	20%	GLY LL
18	Herculex RW	HXRW	*Cry34Ab1 - Cry35Ab1*										x	NCR WCR	20%	GLY LL
19	Herculex XTRA	HXX	Cry1F - *Cry34Ab1 - Cry35Ab1*	x		x	x	x	x	x			x	ECB FAW NCR SWCB WBC WCR	20%	GLY LL
20	Intrasect	YHR	Cry1Ab - Cry1F	x	x	x	x	x	x	x				CEW FAW WBC	5%	GLY LL
21	Intrasect TRIsect	CYHR	Cry1Ab - Cry1F - *mCry3A*	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	20%	GLY LL
22	Intrasect Xtra	YXR	Cry1Ab - Cry1F - *Cry34Ab1 - Cry35Ab1*	x	x	x	x	x	x	x			x	CEW FAW NCR WBC WCR	20%	GLY LL
23	Intrasect Xtreme	CYXR	Cry1Ab - Cry1F - *Cry34Ab1 - Cry35Ab1 - mCry3A*	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	5%	GLY LL
24	Leptra	VYHR	Cry1Ab - Cry1F - Vip3A	x	x	x	x	x	x	x	x	x			5%	GLY LL
25	Powercore	PW	Cry1A.105 - Cry2Ab2 - Cry1F	x	x	x	x	x	x	x				CEW WBC	5%	GLY LL
26	Powercore Refuge Advanced	PWRA	Cry1A.105 - Cry2Ab2 - Cry1F	x	x	x	x	x	x	x				CEW WBC	5% in bag	GLY LL
27	Powercore Enlist Refuge Advanced	PWE	Cry1A.105 - Cry2Ab2 - Cry1F	x	x	x	x	x	x	x				CEW WBC	5% in bag	GLY LL 2,4-D fops
28	QROME	Q	Cry1Ab - Cry1F - *Cry34Ab1 - Cry35Ab1 - mCry3A*	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	5% in bag	GLY LL
29	SmartStax	SS, SX	Cry1A.105 - Cry2Ab2 - Cry1F - *Cry3Bb1 - Cry34Ab1 - Cry35Ab1*	x	x	x	x	x	x	x			x	CEW NCR WBC WCR	5%	GLY LL
30	SmartStax Refuge Advanced	SXRA	Cry1A.105 - Cry2Ab2 - Cry1F - *Cry3Bb1 - Cry34Ab1 - Cry35Ab1*	x	x	x	x	x	x	x			x	CEW NCR WBC WCR	5% in bag	GLY LL
31	SmartStax Enlist	SSE	Cry1A.105 - Cry2Ab2 - Cry1F - *Cry3Bb1 - Cry34Ab1 - Cry35Ab1*	x	x	x	x	x	x	x			x	CEW NCR WBC WCR	5% in bag	GLY LL 2,4-D fops
32	SmartStax RIB Complete	SS SSRIB	Cry1A.105 - Cry2Ab2 - Cry1F - *Cry3Bb1 - Cry34Ab1 - Cry35Ab1*	x	x	x	x	x	x	x			x	CEW NCR WBC WCR	5% in bag	GLY LL
33	SmartStax PRO Refuge Advanced	SSPro	Cry1A.105 - Cry2Ab2 - Cry1F- *Cry3Bb1 - Cry34Ab1 -Cry35Ab1 - dvSnf7*	x	x	x	x	x	x	x			x	CEW WBC	5% in bag	GLY LL
34	SmartStax PRO Enlist Refuge Advanced		Cry1A.105 - Cry2Ab2 - Cry1F- *Cry3Bb1 - Cry34Ab1 - Cry35Ab1 - dvSnf7*	x	x	x	x	x	x	x			x	CEW WBC	5% in bag	GLY LL 2,4-D fops
35	SmartStax PRO with RNAi Technology	SSPRORIB	Cry1A.105 - Cry2Ab2 - Cry1F- *Cry3Bb1 - Cry34Ab1 - Cry35Ab1 - dvSnf7*	x	x	x	x	x	x	x			x	CEW WBC	5% in bag	GLY LL
36	Trecepta	TRE,TRC	Cry1A.105 - Cry2Ab2 - Vip3A	x	x	x	x	x	x	x	x	x			5%	GLY
37	Trecepta RIB Complete	TRERIB TRCRIB	Cry1A.105 - Cry2Ab2 - Vip3A	x	x	x	x	x	x	x	x	x			5% in bag	GLY
38	TRIsect	CHR	Cry1F - *mCry3A*	x		x	x	x	x	x			x	ECB FAW SWCB WBC WCR	20%	GLY LL
39	Viptera = AgrisureViptera 3220EZ	V	Cry1Ab - Cry1F - Vip3A	x	x	x	x	x	x	x	x	x			5% in bag	GLY LL - check bag
40	Viptera Z3 = AgrisureViptera 3330EZ	VZ	Cry1Ab - Cry1A.105 - Cry2Ab2 - Vip3A	x	x	x	x	x	x	x	x	x			5% in bag	GLY LL - check bag
41	Vorceed Enlist	V	Cry1A.105 - Cry2Ab2 - Cry1F- *Cry3Bb1 - Cry34Ab1 - Cry35Ab1 - dvSnf7*	x	x	x	x	x	x	x			x	CEW NCR WBC	5% in bag	GLY LL 2,4-D fops
42	VT Double PRO	VT2P VT2PRO	Cry1A.105 - Cry2Ab2		x	x	x	x	x	x				CEW	5%	GLY
43	VT2P RIB Complete	VT2PRIB	Cry1A.105 - Cry2Ab2		x	x	x	x	x	x				CEW	5% in bag	GLY
44	VT TriplePRO	VT3P	Cry1A.105 - Cry2Ab2 - *Cry3Bb1*		x	x	x	x	x	x			x	CEW NCR WCR	20%	GLY
45	VT3P RIB Complete	VT3PRIB	Cry1A.105 - Cry2Ab2 - *Cry3Bb1*		x	x	x	x	x	x			x	CEW NCR WCR	10% in bag	GLY

46	VT4Pro w/RNAi Tech.	VT4PRO	Cry1A.105 - Cry2Ab2 - Vip3A - *Cry3Bb1 - dvSnf7*	x	x	x	x	x	x	x	x	x	x		5% in bag	GLY
47	YieldGard Corn Borer	YGCB	Cry1Ab		x	x			x	x				CEW	20%	GLY
48	YieldGard Rootworm	YGRW	*Cry3Bb1*										x	NCR WCR	20%	GLY
49	YieldGard VT Triple	VT3	Cry1Ab - *Cry3Bb1*		x	x			x	x			x	CEW NCR WCR	20%	GLY

The OMD Index

The digestibility of nutrients in corn silage is paramount when determining nutritional value. Starch and NDF are responsible for much of the digestible energy in corn silage. In order to give dairy producers and nutritionist a tool to evaluate corn silage hybrids, we developed a new digestibility index, called the Organic Matter Digestibility Index (OMDI or just OMD), and is based on digestibility of protein, fat, NDF, and starch. The sum of which makes up approximately 86-88% of the organic matter in corn silage.

The OMD index represents the digestible portion of silage organic matter and is based on chemical analyses only. It does not predict dry matter intake or milk production, although numerous studies clearly show that digestibility of forage organic matter is directly related to lactation performance of dairy cows. The OMD index does not represent the absolute digestibility of silage organic matter, as this can be reliably determined only in experiments with live animals. But, OMD is representative of the potentially digestible organic matter of the whole plant and can be used to compare silage hybrids. Furthermore, simulation analyses using the Cornell Net Carbohydrate and Protein System (CNCPS v. 6.55; Cornell University, Ithaca, NY) show that OMD correlates reasonably well with model-predicted milk production of dairy cows fed a standard diet containing approx. 40% corn silage (dry matter basis).

How is the OMD Index Used?

Feeding value of corn silage is mostly associated with digestibility of NDF or starch. A long-standing goal of PDMP is to create a single measure of silage nutritive value using several variables associated with digestibility. Traditional variables, crude protein (accounted for fiber-bound nitrogen), NDF, starch, lignin, and fat, are combined with digestibility determinations for NDF (NDFD30*) and starch (IVSD; 7-hour, 1-mm grind). Once combined, these digestibility coefficients sum to predict OMD.

The OMD Index is calculated using the following equation: OMDI (%) = {[(crude protein – NDICP) × 0.89] + (total fatty acids × 0.75) + (starch × IVSD ÷ 100) + [(aNDFom - lignin) × NDFD30 ÷ 100)]} ÷ [(crude protein – NDICP) + total fatty acids + starch + (aNDFom – lignin)] × 100.

Where: OMDI (%) is Organic Matter Digestibility Index; crude protein, total fatty acids, starch, NDICP (NDF-bound crude protein), aNDFom (ash-free basis, amylase-treated NDF), and lignin (ash-free) are expressed as % of corn silage dry matter; 0.89 is assumed (based on literature data) coefficient of digestibility of silage crude protein; 0.75 is assumed (based on literature data) coefficient of digestibility of silage total fatty acids; IVSD is starch digestibility (by NIRS at 7-hour and sample ground through a 4-mm sieve) expressed as % of starch; and NDFD30.

Use of OMDI: The OMD index is intended to represent the digestible portion of silage dry matter and is based on chemical analyses. OMD does not represent the absolute digestibility of silage organic matter, but it is representative of the potentially digestible organic matter and can be used when comparing silage hybrids. ***Simply put, the higher the OMD value, the higher the overall expected digestibility of the silage.*** OMD reflects the digestibility of key nutrients within the entire plant. Producers without carryover of silage should consider the interaction of OMD and DOM (digestible organic matter yield per acre) as yield of digestible organic matter will be equally as relevant as OMD.

Conclusion

Organic matter digestibility is not a new measure. For years, researchers and nutritionists have used digestibility estimates to formulate rations for dairy cattle. Today, integrating these data is a useful practice to gauge silage value and match hybrid to farm needs. Put simply, OMD measures whole plant digestibility. Emphasis is on digestibility of all main nutrients. In the end, we hope OMD serves to facilitate discussion among producer, seed consultant, and dairy nutritionist as to which hybrids offer the best nutrient value for dairy cows.