Reducing the Risk of Corn Silage Hybrid Selection

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Corn yield in Wisconsin since 1866





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Corn yield progress in Wisconsin





Overview

- Selecting hybrids from the UW corn silage trial program.
- How do hybrids selected this year perform the following year?
- "It is probably not worth your time to conduct your own onfarm trials."









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Number of hybrids tested in the UW Corn Trials





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2005 Wisconsin Corn Performance Trials Silage Summary

	1995-	<u>1995-2004</u>		05	Percent
Location	Ν	Yield	Ν	Yield	change
Arlington	543	9.5	56	8.9	-5
Lancaster	543	8.1	56	9.7	19
Fond du Lac	533	8.4	60	8.7	3
Galesville	538	8.6	60	10.1	17
Chippewa Falls	155	7.7	50	6.5	-15
Marshfield	543	6.8	50	7.7	13
Valders	543	6.8	50	7.4	9
Rhinelander	69	6.3	22	8.7	38
Spooner	138	7.9	44	6.2	-22



Top 10 Corn Silage Hybrids in the Southern Production Zones during 2005

Hybrid	Yield	Hybrid	Yield
Southern zone	T/A	South central zone	T/A
Croplan Genetics 691BtLL	10.6	NK Brand N48-V8	10.8
OBrien OB1113Bt	10.3	Croplan Genetics 693HXLLCL	10.6
Lemke 7068Bt	10.1	Carharts Blue Top CR1960RB	10.3
Kaltenberg K8112LF	10.1	Pioneer 34M93	10.3
Renk RK684	10.1	Kaltenberg K8110LF	10.3
Renk RK684YGCB	10.1	Garst 8689IT	10.3
Dekalb DKC61-45(RR2YGCB)	10.0	Croplan Genetics DS107HXLL	10.0
Renk RK854	10.0	Crows 4908	10.0
Dekalb DKC63-62(RR2)	9.9	Golden Harvest H9006Bt	10.0
Kaltenberg K8110LF	9.7	Univ Wisconsin EX09	10.0
Bold = Normal hybrid			



Top 10 Corn Silage Hybrids in the Northern Production Zones during 2005

Hybrid	Yield	Hybrid	Yield
North central zone	T/A	Northern zone	T/A
Gold Country GCS9606SLS	8.3	Pioneer 37A92	7.7
Pioneer 35D28	8.2	Garst 8921YG1RR	7.7
Pioneer 34M93	8.1	Renk RK488YGCB	7.6
Pioneer 34A86	8.1	Renk RK452LLYGCB	7.6
Golden Harvest H7990Bt	8.0	Kaltenberg K8099LFRR	7.5
NK Brand N49-E3	7.9	Pioneer 38W22	7.5
Pioneer 35Y67	7.9	Pioneer 37R70	7.5
Golden Harvest H8069Bt	7.9	Carharts Blue Top CX585Bt	7.1
Garst 8921YG1RR	7.8	Carharts Blue Top CX1857Bt	7.1
Legacy Seeds L2927Bt	7.8	NK Brand N33-H6	7.1
Bold = Normal hybrid			



Begin with trials in zone(s) nearest ...

Identify at least two and preferably three groups of hybrids with similar

moisture at harvest (within 1			-2	%)) [Stare (·*)	aro	nostad	whon a hyb	rid is	
Renk RK80 Carharts Blue Top CX1 Univ Wisconsin EX0	Consider sing	9.4 3420 32000 gle location re	_{65.2} sult	- H	yk	Within the h	he he hvbr	Ma) Mas	kimum h	ybrid minus different fro	the LSD	
Shaded area multi-loca	extreme caut Use locations	ion, even if n to evalu ate c	ext : on	c s Hj	ybī	Maximu nu matu	m l	nyb	rid in the	e trial.sted in mar within a	about	
averages the	nat provide	and years.	lan	1-	- <u>F</u>	or exar	mp	le:	sture.			
the best esti	mate of	.	88.0		T	The maxi	imu	ım l	hybrid ir	this trial		
relative perfe	ormance.	9.2 3460 31800	66.0	7	. h	1ad 3720) lb	mil	k/T. The	$SD = 90^{1}$	b milk/T.)
Heartand Hybrids, TH30 Golden Harvest H900		8.8 3370 29700 10.0 3420 34100 *	66.4 66.5	7	Λ	n iate.	372	0_	90 = 30	saha Relativ	ê Matûrî	ty 🔒
Golden Harvest Hosz. La Crosse Forage LC75	2LL D 12	8.8 3310 29200 8.0 3330 26500	3310 29200 66.7 7 N All hybrids yielding >= 3630 lb milk/T are				x/T are					
Johnson Seeds 5450		8.5 3440 29100	67.5 7.3 starred. We conclude that these hybrids					brids	.6			
LSD = If the	e difference b	etween two	67.6 67.8	7.1	a	ire not d	liffe	eren	it from tl	he maximun	n hybrid.	7.
hybrids is gr	eater than or	equal to	67.9	7.1	⊢	lybrids r	not	sta	rred are	lower yieldi	ng than	
the LSD value, then you can be sure			68.2	7.2	tl	he top h	iybr	id ((correct	9 of 10 char	nces).	
that in 9 of	10 chances th	e hybrids	68.2 68.3	7.2 6.7	23 24	4/ 81 46 80	59 56	27 30	7.9 9.1 8.6 * 9.2	9.9 3630 36100 *	9.2 * 10.6 *	9.2
perform differently.			68.7	7.3	24	46 80	57 64	30 29	8.9 * 9.7 7.5 8.5			
MEAN LSD(0.10)**	<u>Mean</u> =	Zone or Loc	atio	n a	ver	rage	56 1	32 3	8.6 10.1 1.2 1.0	8.6 3560 30400 0.9 130 3700	7.8 9.4 1.3 1.2	9.1 1.0

⁺ Code = Trait(Gene): B=bmr(bm3); C=IMI(IT); D=LL(T25); F,G,K,L=Bt-ECB(Bt176, Mon810, Bt11, TC1507); H,J=RR(MonGA21, Nk603); M=Leafy; N=Bt-CRW(Mon863); X=Unknown.

Average whole plant moisture of all hybrids in the trial as rated by the Minnesota Relative Maturity Rating System. Ratings are rounded to 5 day increments.

Hybrids that performed statistically similar to the highest hybrid in the trial.

Shaded results provide the best estimate of relative hybrid performance.





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Table 1b. Companies and hybrids included in the 2005 trials. A star (*) indicates that the hybrid performed statistically similar to the highest hybrid for yield or performance index (P.I. or MILK2000) in one or more zones.

Brand Hybrid Genes	Relative N	Seed	Brand Hybrid	Traits- † Genes	Relative Ma	a <u>turity</u> See LSRM Tables T	ed Frt
AgriGold A6205Bt Bt-G	96 96 96	6 55	Cornelius C592RRYG	Bt,RR-GJ	110 109	109 5,12 4	46
* AgriGold A6225BtRR Bt,RR-G		Troito ond		274 - 2 ⁷⁵	110 111	5* 4	46 51
AgriGold A6235 AgriGold A6305Bt Bt-G	<u>Speciality</u> I	raits and	<u>Genes</u> de stud			55	21
AgriGold A6333Bt Bt-G	1 <u>04</u> 105	47 SS		8488-848-		8 3	37
* AgriGold A6395	• Iraits	I • Compan	Y 🔄 - Zone <mark>whe</mark> r	e hvbrid	was teste	ed 8 3	37
AgriGold A6398	108 107 108		in the second			9 3	37
AgriGold A6474	• Genes (cod	de at bottor	n of page)	BI,RR-GJ	95 95 95	6,9 3	37
AgriGold XA5020BtRR Bt,RR-G * AgriGold XA5509Bt Bt-G	J 100 101 • 102 106		Constant Constant of Statements	DUPR-CU PR RR-CU	98 99 99	0 6,9 3 0 4.6.9 3	37 37
Agricold Actoropy	102 100	• WI Grair	n and Silage RM	ER, R.RGJ	100 100 98	6 3	37
* Asgrow RX668RR2YGCB Bt,RR-G	J 107 110 106	51,14 50	* Croplan Genetics 501RRBI	BLRR-OJ	103 105 103	7* 3	37
* Asgrow RX715RR2 RR-J	111 111	- Purpos	se is to verify matur	ity	104 105 104 104 105 104	43	37 37
* Brown 3000YGCB Bt-G	90 90 90	so that	comparisons can h	o mado	107 109	5* 3	37
* Brown 5636RR2YGCB Bt,RR-G	J 101 101 104	30 11 14			112 112 110	111 5*,12* 3	37
Brown 7044 Brown EX804LL LL-D	112 112 111 83 84	betwee	en companies.	81.11-1.0	111 108	106 14 3	37 37
			Cropian Genetics 731HXLL	Bt,LL-LD	113	112 12 3	37
Brunner EXP102RR RR-X	100	4 \ !	uropian Generus Dorivita. Contes Classica Contes -		107 107	108 14 3	37
Brunner Exp93	¹⁰⁸ 93 <u>Stars (</u>	<u>^):</u> Indicate	e nybrid was not	different	104 105	103 14 3	37
Brunner S1137Bt Bt-G	¹¹⁰ from t	he ton nerf	orming hybrid in	zone for			
Brunner S2053RR RR-X	82 10 10 10			20110 101	102 102 110	103 11* 3 5* 3	37
* Brunner S3403RRBt Bt.RR-G		r P.I.			110 1 <mark>0</mark>	, 107 14* 3	37
* Bru						6* 3	37
^{* Bru} Use multi-l	ocat •~ 40-5	50% of hyb	rids listed in table	e are sta	rred	14 3	37 37
			er heildeil to heilt ar o			5 3	37
Bru Lleo "Tho Lr	AAA Use to	evaluate c	onsistency	* <i>11</i>		9 5	55
		<u>itiance i</u>				0 5 9* 5	55
* Cafnana висе гор отстачотов волго-о	0 100 100 20	0,0,10,10 04		5.0	100 104	75	55
* Carharts Blue Top CR840RB Bt,RR-G	J 85 85 87 91	8,10,15,17* 34	Dahlco 3099Bt Dahlco 3920Bt	Bt-G	99 100) 65 . 95	54 55
* Carharts Blue Top CX1857Bt Bt-G	90 88 92 8	3*,10*,15*,17* 7	Dahlco 4051Bt	Bt-G	105 102	2 7 5	55
* Carharts Blue Top CX1956Bt Bt-G	95 95 95 97	6,9*,13,16 34	* Dahlco 4101Bt	Bt-G	110 104	7* 5	54
* Carharts Blue Top CX585Bt Bt-G	85 86 87	8,10*,15*,17* 34	Dahlco 4121RRBt	Bt,RR-GJ	112 111	5 5	55
* ornelius C327YG Bt-G	101 103	4* 51	Dahlman D4215CB	Bt-G	85 85 85	5 8 5	54
ornelius C358RRYG Bt,RR-G	J 102 104	4 51	* Dahlman D4515	Bt-G	90 92 89	8* 5	54
* ornelius C382YG Bt-G	104 103 101 104 103	4,11* 51	Dahiman D4801 Dahiman D4815	Bt-G	96 96 94	95	54 54
rnelius C584	111 111 111	5,12 51	Dahlman R4215	RR-J	85 85 85	5 8 5	54
ornelius C590YG Bt-G	110 109 111	5,12 46	Dahlman R4515	RR-J	90 90 88	8 5	54

† Trait-Gene=Code: bmr-bm3=B; IMI:IT=C; LL-T25=D; Bt-ECB-Bt176=F,Mon810=G,Bt11=K,TC1507=L; RR-MonGA21=H,Nk603=J; Leafy-Ify=M; Bt-CRW-Mon863=N; Unknown-X.



List of hybrids tested in the Wisconsin Corn Performance Trials between 2003 and 2005. A star (*) indicates that the hybrid performed statistically similar to the highest hybrid for yield or performance index (P.I. or MILK2000) in one or more zones.

Brand Hybrid	Voortostod	Brand Hybrid	Voortoctod	Propd Hybrid	Voortootod	Brand Hybrid	Voor tootod
	reartesteu	Dranu Hybrid	reartesteu	Branu Hybrid	reartested	10-rand Hybrid	Tear tested
Access A1506RR	04	Brown 5020	03	10	05*	Crows 3520B	03,02,01
Access A1597RR	04	Brown 5130YGCB	03	Cornelius C327YG	05-	Crows 438B	03,02,01-
Access A5405YGCB	04^	Brown 5345YGCB	03	Cornelius C358RRYG	05,04*	Crows 4903B	05-,04-
Access A5410YGCB	04	Brown 5636	03	*Cornelius C382YG	05*,04*	*Crows 4908	05*,02*,01
Access A5503YGCB	04*	*Brown 5636RR2YGCB	05*,04*	Cornelius C406	04	*Crows 4911B	04,03*
Access A8407HX	04	Brown 6079	03,02,01	*Cornelius C417YG	05,04*,03	*Crows 4S502	05*
		Brown 6220	04,03,02	*Cornelius C430YG	03*	Crows SR472B	05
Ag+ Seeds 5492Bt	03	*Brown 6895YGCB	03,02,01*	Cornelius C443YG	03	Crows X51021RB	05
Ag+ Seeds 6290Bt	03	*Brown 7044	05,04,03*,02,01*	Cornelius C572	03	Crows X51081B	05
Ag+ Seeds 6387RR	04,03	Brown EX804LL	05	Cornelius C584	05		
		Brown X48RR2	04	*Cornelius C590YG	05,04*,03*,02*,01*	Dahlco 2141RRBt	04
'AgriGold A6205Bt	05,04,03*	Brown X7171YGCB	03	Cornelius C592RRYG	05	Dahlco 2147Bt	05
'AgriGold A6225BtRR	05*			Cornelius C599	03	Dahlco 2288RRBt	04,02
AgriGold A6235	05	*Brunner B2495	03,02,01*	Cornelius C605YG	03	*Dahlco 2482Bt	05*,04
AgriGold A6235Bt	04,03	Brunner EXI	Q.4.	1Comelius C635	001,021	Dahloo 250534	05,04
AgriGold A6263	04	Brunner EXF Doviou	v "Tha 🗉	ictory"		Dahloo 30898t	05
'AgriGold A6305Bt	05.04*.03		<u>и пеп</u>			Dehico 3920Bt	05
'AgriGold A6333	04*.02.01	*	051.04	Comatus CB76VG		Ophion 4051Rt	05.04
'AgriGold A6333Bt	05.04*.03*.02*.01	Dunner EXI		Condia C707BBYS	. 042 032	Chables 410104	05*
AgriGold A6375	03	Brunner EXE ISTS 2	Il hybrids	tested during t	he nrevio	us 3 vears	05
'AgriGold A6395	05* 03* 02*			tested daring t		us s yours.	04
'AgriGold A6395Bt	05* 04*	*Brunner Exp				Tradien XCC 5083	04
AgriGold A6398	05.04	Brunner S11 - Store (*) indicata	hybrid was simila	r to top by	brid for	04*
AgriCold A6454	00,04) indicate	TIYDITU Was siitilla	ι το τορ πγ		04*
AgriGold A6474	04	*Brupper S20			\sim \sim	 Antice structure and the structure st	04
	05	Brunner S20 Dertorn	nance inde	x (p.i. or iviiikzuuu	J) in one o	r more zones.	04
AgriCold XA5020BIRR	03	Brunner S20			 Ome 1,000 mar 	national management	05
AgriGold XA5234	03	Brunner S2002RRDt	05,02	Oroplan Constice 004Pt	0.0	Dahlman D421000	05
AgriGold XA5311Bt	04	Brunner S3403RRBt	05",04"	Cropian Genetics 334Bt	04	Daniman D4301	03,02,01
AgriGold XA5416Bt	04	Brunner S3630RR	04",03	Croplan Genetics 344Bt	03,02	Daniman D4411Bt,LL	04
	05	Drummer S3000BL	04	Cropian Genetics 354Bt	04,05	Daniman D4501Bt	05,02
AgriGola XA6302	03	Brunner S3704Bt	05",04"	Cropian Genetics 355RRBt	05	Daniman D4515	05",04",03",02"
		Brunner S3792RRBt	05^,04^	Croplan Genetics 364Bt	04^,03^	Daniman D4547	04
Asgrow RX499YG	03	Brunner S3903RRBt	03	Croplan Genetics 388RRBt	05	*Dahlman D4747Bt	04,03*
'Asgrow RX668RR2YGCB	05*	*Brunner S4498	04*	*Croplan Genetics 401Bt	04,03*	*Dahlman D4801	05,04*,03*,02*
Asgrow RX702YG	03	Brunner S4605RR	05	Croplan Genetics 401RRBt	05	*Dahlman D4815	05,04*,03
'Asgrow RX715RR2	05*	Brunner S4903Bt	04	Croplan Genetics 421RRBt	05	*Dahlman D5102Bt	03*,02*,01*
		Brunner S4954	05	Croplan Genetics 441Bt	04	*Dahlman R4215	05,04,03*
Badgerland BL466	04	*Brunner S4993	03*	Croplan Genetics 501Bt	04	Dahlman R4515	05,04
Badgerland BL484	04	Brunner S5202	03,02	*Croplan Genetics 501RRBt	05*,03*	Dahlman R45S15	05,03
'Badgerland BL509Y	03*	*Brunner S6408Bt	03,02*	*Croplan Genetics 503Bt	05,04*,03*,02*,01	*Dahlman R4815	05,04,03*
		Brunner S8104	04	Croplan Genetics 503HXLL	05		
Baldridge Hybrids BH515	03	Brunner S8204	05,04	*Croplan Genetics 576BtLL	05*	Dairyland DST10427	03
Baldridge Hybrids BH611A	03			*Croplan Genetics 601Bt	04,03*	*Dairyland DST10562	04*
		Carharts Blue Top CR1080RB	04	Croplan Genetics 613Bt	04	*Dairyland DST10563	05*
'Bio Gene BG0940	04*,03*	Carharts Blue Top CR1505RB	05	Croplan Genetics 683Bt	04	*Dairyland DST10832	04*
Bio Gene BG0991	04	*Carharts Blue Top CR1857RB	04*,03*	*Croplan Genetics 691BtLL	05*,04*,03	Dairyland HiDF3007	05
Bio Gene BG1075	04,02	*Carharts Blue Top CR1960RB	05*,04*	*Croplan Genetics 693Bt	04*	*Dairyland HiDF3086	05*,04
Bio Gene BG1111	03	*Carharts Blue Top CR840RB	05*.04*.03*.02	*Croplan Genetics 693HXLLCL	05*	*Dairyland HiDF3300	04.03*.02*.01
Bio Gene BG1119	04	*Carharts Blue Top CR8500RB	03*.02*	Croplan Genetics 693Hx	05	Dairyland HiDF3600	03,02
Bio Gene BG991	03	Carharts Blue Top CR85RR	03	Croplan Genetics 731HXLL	05	*Dairvland HiDF4200	05*.04.03*.02*.01*
Bio Gene BT1071	03.02	Carbarts Blue Top CX1057Bt	04.03	Croplan Genetics DS107HXLL	05	Dairyland Stealth 1089Bt	03.02.01
		Carbarts Blue Top CX1080Bt	03	Croplan Genetics DS107RR	04.03	*Dairyland Stealth 1280	04.03.02.01*
Brown 1811YGCB	03	*Carbarts Blue Top CX1111Bt	05*	Croplan Genetics DS93RR	05	Dairyland Stealth 1287RR	03
'Brown 3000YGCB	05* 04 03*	*Carbarts Blue Top CX1505Bt	04*	Croplan Genetics DS94RR	04	*Dairyland Stealth 1297	03* 02 01*
'Brown 3020YGCB	04.03*	*Carbarts Blue Top CX1857Bt	05*	Croplan Genetics TR1047Btl L	05	Dairyland Stealth 1416	00,02,01
'Brown 4250YGCB	04* 03*	*Carbarts Blue Top CX1057Bt	05* 04* 03*	Gropian Conciles Intrograbile	05	Dairyland Stealth 1476	03
Brown 4688W/X	04,05	*Carbarts Blue Top CX585Bt	05,04*	*Crows 1703B	04.03*	Dairyland Stealth 1488	04
Brown 4010RRVCCR	04	*Carbarte Blue Top CX8500A	04 02 02* 04*	*Crowe 2192B	05* 04:03	*Dainyland Stealth 1406	03 03* 04*
DIOWIN 40 TOTAL I GOD	04	Gamaria blue Top CX0000A	04,00,02,01	010003 21820	60, 1 0, 60	Danyiana otealun 1450	03,02,01



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How well do the UW Silage Trials Predict next Year's Performance? Materials and Methods

- 1995 to 2005: Hybrids tested at multiple locations in zone.
- Picked hybrids based on criteria:
 - ✓ Location(s) star (*)
 - ✓ Zone star (*)
- Simuated success of selection strategies (n=64) the following year:
 - Top hybrid
 - ✓ Top three hybrids
 - Top hybrid in 3 maturity groups
 - ✓ Top 10% of hybrids
 - ✓ Average
 - ✓ Bottom 10% of hybrids





Next year's forage yield performance of a hybrid using various selection strategies. Simulated using UW Hybrid Silage Trial Results 1989-2005 (L=Location, Z=Zone)



Frequency (%)



Next year's Milk per Ton performance of a hybrid using various selection strategies. Simulated using UW Hybrid Silage Trial Results 1989-2005 (L=Location, Z=Zone)





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Next year's Milk per Acre performance of a hybrid using various selection strategies. Simulated using UW Hybrid Silage Trial Results 1989-2005 (L=Location, Z=Zone)





Next year's Milk per Acre performance of a hybrid using various selection strategies. Simulated using UW Hybrid Silage Trial Results 1989-2005 (L=Location, Z=Zone)



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Next year's performance of a hybrid selected using a Zone * and <u>></u> 2 Location * for 2 years and planted at any Location.





Economic consequences of selection strategies

(Data source: UW Trials 1995 to 2005)

Selection scheme	Relative forage yield	Milk per Ton difference	Milk per Acre difference
	percent	Lb/T	Lb/A
1 L* (on-farm)	5	100	1140
Z* & <u>></u> 2L*	8	200	1810
Z* & <u>></u> 2L* (2 yrs)	11	280	2570
1 L average	1	-10	170
1 L bottom 10%	-3	-60	-170



Economic consequences of selection strategies over

time (Data source: UW Trials 1995 to 2005)

	Previous years		Selected year		Future years		
Selection scheme	-2	-1	0	1	2	3	4
	Relative forage yield (%) difference						
1 L* (on-farm)	10	8	16	5	6	6	2
Z* & <u>></u> 2L*	11	9	15	8	8	7	8
Z* & <u>></u> 2L* (2 yrs)	12	12	17	11	11	10	10
1 L average	4	3	0	1	1	-1	-3
1 L bottom 10%	0	-1	-18	-3	-1	-9	-15



Summary

- Use multi-location average data.
- Preference for two or more years of data.
- Use single location data to evaluate consistency.
- Final thoughts ...
 - You are taking a tremendous gamble if basing your hybrid selection decisions on 1 or 2 local test plots
 - "Variation for yield exists among commercial hybrids in Wisconsin."
 - □ 70 bu/A in grain trials
 - □ 12,100 lb milk/A in silage trials



