2009 Agronomy Update Meetings

Platteville, Arlington, Janesville, Sparta, Eau Claire, Wausau, Kimberly, and Fond du Lac

Joe Lauer

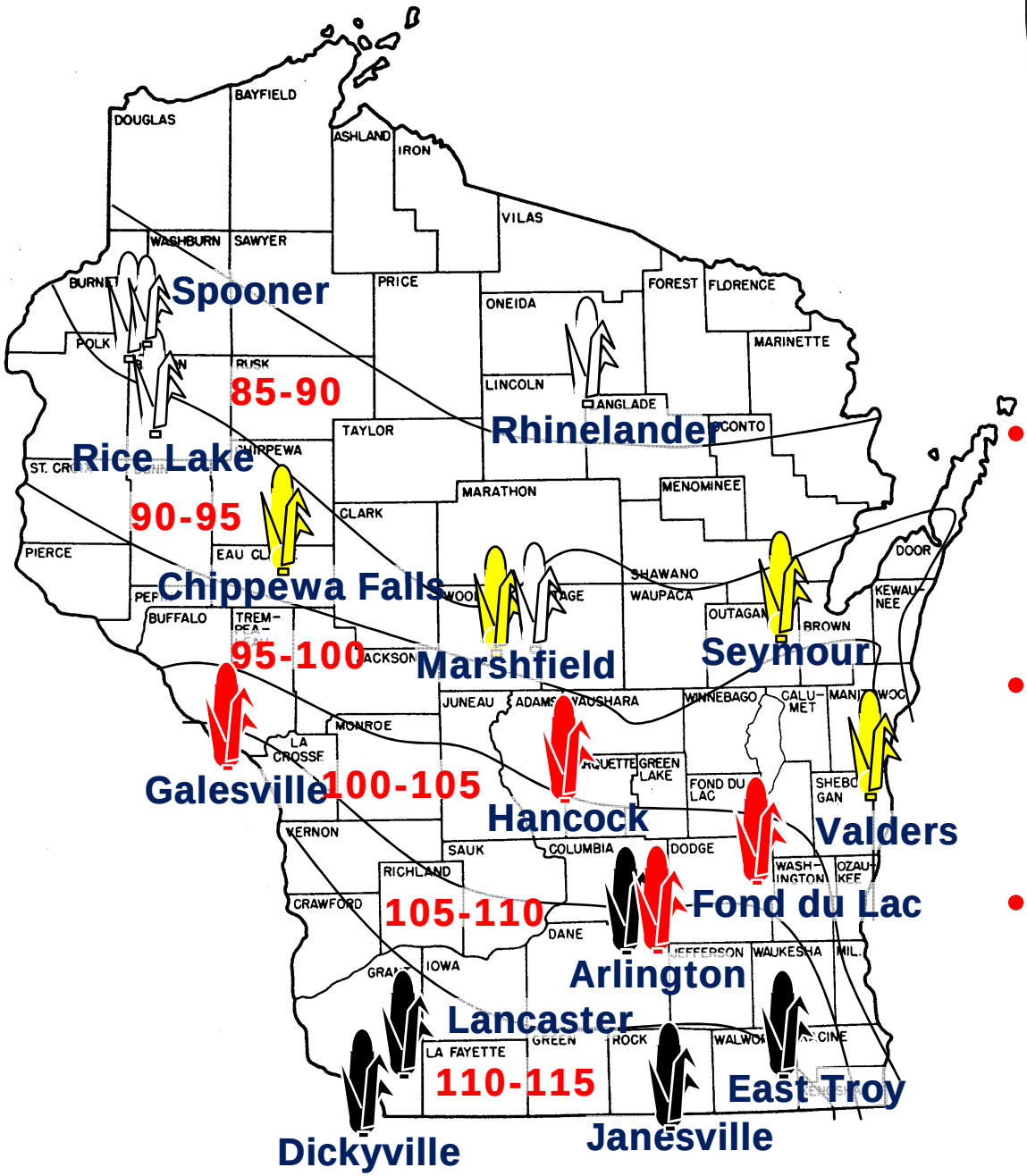
University of Wisconsin

Cooperating with Grant, Columbia, Rock, Monroe, Eau Claire, Marathon, Outagamie, and Fond du Lac Counties

January 5 – 9, 2009

Highlights for corn production during 2008

- **Records**
  - ✓ Five locations have a 10-yr average > 200 bu/A (up 1 Loc from 2007).
  - ✓ “Most expensive corn crop ever planted.”
- **Growing season**
  - ✓ Lost grain and silage trials at Rhinelander due to poor stands caused by crane feeding.
  - ✓ Fourth year of drought in NW WI
  - ✓ Rains in early June caused significant soil erosion in SC WI.
    - ❑ Fishing for carp in WI corn fields.
    - ❑ Denitrification at many sites
  - ✓ Increased frequency of multiple ears
- **New things in the Hybrid Trials**
  - ✓ New corn precision vacuum planter. No longer thinning.



THE UNIVERSITY of WISCONSIN MADISON

Corn Agronomy Program 2008

Rationale and Situation

- Corn is grown on 4 million acres in WI. A one bushel increase by farmers increases farm income $8 to $16 million dollars annually.
- In 2008, 520 corn hybrids were tested at 14 locations.

Objective

- To provide unbiased performance comparisons of hybrid seed corn available in Wisconsin.

2008 Wisconsin Corn Performance Trials
Grain Summary

	1998-2007		2008		Percent
Location	N	Yield	N	Yield	change
Arlington	1925	215	274	215	0
Janesville	1878	218	218	212	-3
Lancaster	1790	208	174	208	0
Fond du Lac	1468	187	164	200	7
Galesville	1578	203	148	197	-3
Hancock	1595	216	159	213	-1
Chippewa Falls	1197	143	155	184	29
Marshfield	1546	164	211	129	-21
Seymour	1221	165	155	163	-1
Valders	1554	165	155	185	12
Rhinelander/White Lake	153	170	---	---	---
Spooner	1427	136	168	126	-7

2008 Wisconsin Corn Performance Trials
Silage Summary

Location	1998-2007 N	1998-2007 Yield	2008 N	2008 Yield	Percent change
Arlington	589	9.6	82	10.2	6
Lancaster	589	8.9	82	9.2	3
Fond du Lac	636	8.6	63	8.6	0
Galesville	641	9.1	63	8.8	-4
Chippewa Falls	260	7.1	61	7.3	3
Marshfield	557	7.4	80	6.0	-19
Valders	557	7.2	61	8.7	22
Rhinelander	144	7.2	---	---	---
Spooner	288	6.9	38	6.8	-2

Overview

- The economics of hybrid maturity
- Tillage interactions with hybrid performance
- Producing corn with high seed prices and costs

Question?

- **What relative maturity is a full-season hybrid on your farm?**
  - a) >= 110 days
  - b) 100-109 days
  - c) 90-99 days
  - d) 80-89 days
  - e) <= 79 days

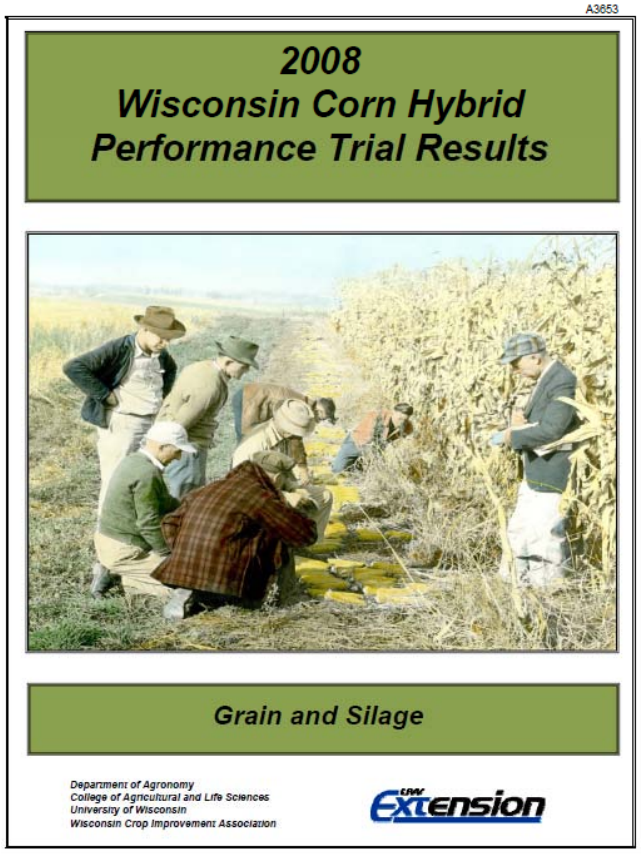
Finding hybrid maturity information in the UW Corn Hybrid Performance Report

Table 2. Companies and hybrids included in the 2008 trials. A star (*) indicat
for yield or performance index (P.I. or MILK2006) in one or more zones.

			Relative Maturity			Seed	
	Brand Hybrid	Traits - Genes†	Co.	GRM	SRM	Rt.	Tables
	AgriGold A6225VT3	CB,CR,RR-GQJ	99	98		55	8
*	AgriGold A6279VT3	CB,CR,RR-GQJ	101	103		55	6, 9*
*	AgriGold A6309BtRWRR	CB,CR,RR-GNJ	103	103	101	55	6, 9, 15*
*	AgriGold A6323CL	IMI-C	103	104	102	55	15*, 22*
*	AgriGold A6325VT3	CB,CR,RR-GQJ	104	104	101	55	6, 9, 15*
	AgriGold A6394VT3	CB,CR,RR-GQJ	108	110	107	55	7, 13
	AgriGold A6399VT3	CB,CR,RR-GQJ	108	107		55	9
*	AgriGold A6439VT3	CB,CR,RR-GQJ	109	109	107	55	7*, 13*, 16*
	AgriGold A6459VT3	CB,CR,RR-GQJ	110		112	55	14
	AgriGold A6474VT3	CB,CR,RR-GQJ	111		111	55	14
*	AgVenture AV7597V3R	CB,RR-GJ	106		106	118	13*
	AgVenture AV7729CBLL	CB,LL-KD	107		107	118	13
*	AgVenture G6512	RR-J	97		103	118	13*, 15*
*	AgVenture R4926VBW	CB,CR,RR-GNJ	94		96	118	15*, 17*
*	AgVenture R5677VBW	CB,CR,RR-GNJ	97		101	118	15*
	AgVenture R6608YBW	CB,RR-GJ	100		106	118	13
*	AgVenture R6864	RR-J	102		106	118	13*
*	AgVenture RL5906HBW	CB,LL,RR-LDJ	97		99	118	15, 17*
*	Blue River 25M90		88	93		96	21*
	Blue River 30B19		90	94		96	21
*	Blue River 41R00		97		95	96	17*
*	Blue River 42A32		96	96		96	21*
	Blue River 46L96		100		103	96	18
*	Blue River 48B30		103	101	104	96	18*, 21*
*	Blue River 56M30		106	104		96	21*
	Blue River 59L36		108		107	96	18
	Carharts Blue Top C9000Bt	CB-G	90	87		55	10, 12
*	Carharts Blue Top CR1185V	CB,CR,RR-GQJ	85	87		2	10*, 12*
	Carharts Blue Top CR1857R	CB,RR-GJ	90	95		55	8
	Carharts Blue Top CR1995V	CB,CR,RR-GQJ	95	96		33	8, 11
	Carharts Blue Top CR9680V	CB,CR,RR-GQJ	98	98		55	6, 8, 11
*	Cornelius C382YG	CB-G	103		105	99	13*
	Cornelius C447VT3	CB,CR,RR-GQJ	104	103		99	6
*	Cornelius C454XTLL	CB,CR,LL-LPD	105	106	107	99	6*, 13*
*	Cornelius C462		104	104		99	22*
*	Cornelius C466XTLL	CB,CR,LL-LPD	105	105		99	6*
	Cornelius C547VT3	CB,CR,RR-GQJ	107	109		99	7
*	Cornelius C591		109	106		99	22*
*	Cornelius C595YG	CB-G	109	109	105	99	7, 13*
	Cornelius C649VT3	CB,CR,RR-GQJ	110	109	111	99	7, 14
	Croplan Genetics 238VT3	CB,CR,RR-GQJ	85	85		37	10
	Croplan Genetics 2520TS	CB,CR,RR-GNJ	86	86		37	10
	Croplan Genetics 2538RR	RR-J	86	88		37	10
*	Croplan Genetics 3114VT3	CB,CR,RR-GQJ	91	95	94	37	11*, 17*
*	Croplan Genetics 3456VT3	CB,CR,RR-GQJ	95	97		37	11*
*	Croplan Genetics 3514VT3	CB,CR,RR-GQJ	95	98	95	37	11*, 17*
*	Croplan Genetics 3724VT3	CB,CR,RR-GQJ	96	98		37	8, 11*

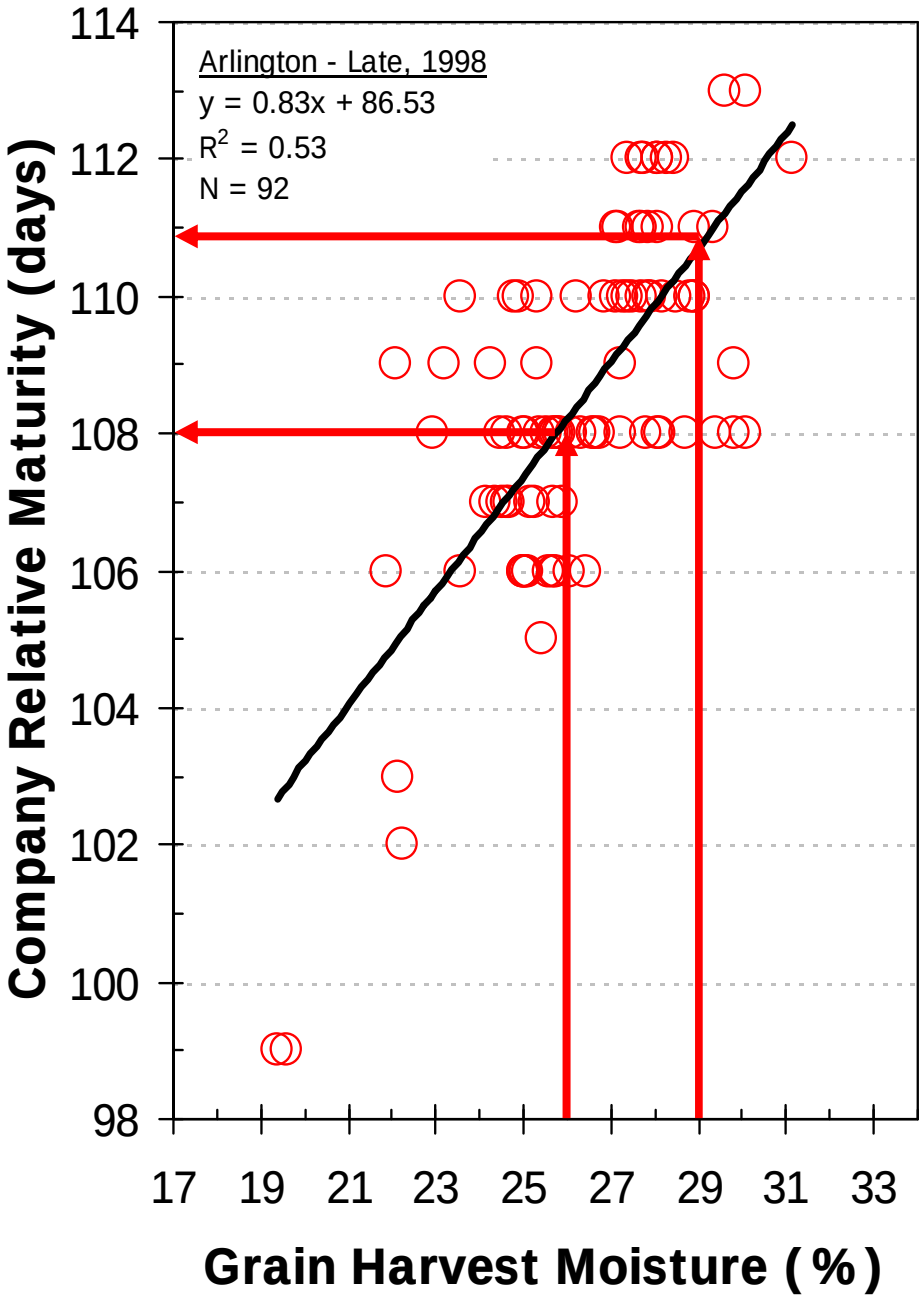
† Code = Trait(Gene); B = bmr(bm3); C = IMI(IT); D = LL(T25); F, G, K, L = Bt-CB: (Bt176, Q, R = Bt-CR (Mon863, DAS591227, Mon88017, MIR604); X = Unknown.

- **Relative Maturity (RM)**
  - ✓ **Company RM (from Entry form)**
  - ✓ **WI Grain and Silage RM**
    - ❑ - Purpose is to verify maturity so that comparisons can be made between companies.



Method for Determining Wisconsin Relative Maturity (since 1998)

GRM = Grain Relative Maturity, **SRM** = Silage Relative Maturity



- **For every hybrid, we know:**
  - ✓ Company Relative Maturity
  - ✓ Grain harvest moisture
- **Regress Company RM values and Grain harvest moisture for each hybrid at every location.**
- **For example:**
  - ✓ In trial at left, all hybrids harvested at 26% moisture = 108 d GRM. All hybrids at 29% moisture = 111 d GRM.
- **GRM = Average of all locations.**
- **SRM uses a similar method, except forage harvest moisture is used.**
- **"Bottom line:" Maturity comparisons can be made between companies.**

Compare hybrids of similar maturity ...

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

Table 11 (continued). North Central Zone - Late Maturity Grain Trial. (page 3 of 3)

91 DAY RELATIVE MATURITY OR LATER, BASED ON COMPANY RATING (CHIPPEWA FALLS = CHP, MARSHFIELD = MAR, SEYMOUR = SEY, VALDERS = VAL)

			2008									2007					7 Test
			AVERAGE					CHP	MAR	SEY	VAL	AVERAGE		MAR	SEY	VAL	AVERAGE
			Yield	P.I.	Moist	Test	Lodged	Yield	Yield	Yield	Yield	Yield	P.I.	Yield	Yield	Yield	Yield
BRAND	HYBRID	Genes†	bu/A	#	%	Wt.	%	bu/A	bu/A	bu/A	bu/A	bu/A	#	bu/A	bu/A	bu/A	bu/A
Dyna Gro	55V18	GQJ	163	99	25.0	55	1	174	122	164	194	170					
Pioneer	37Y14	LPDJ	178 *	103 *	25.0	53	0	198 *	130	176	207 *	182					
Gold Country	9810VT3	GQJ	172	101 *	25.1	53	0	205 *	127	164	191	181					
Legend Seeds	LR9798VT3	GQJ	161	98	25.1	54	0	181	119	163	182						
Croplan Genetics	3456VT3	GQJ	176	103 *	25.1	53	0	189	131	183	202						
Johnson Seeds	7100CBLLRW	KRD	163	98	25.2	51	1	176	123	154	199						
Growmark	FS49SV3	GQJ	175	102 *	25.3	53	0	214 *	121	172	192						
Midwest Genetics	70006R	J	164	98	25.3	52	1	213 *	122	152	169						
NuTech	1N-398CBLLRW	KRD	169	100	25.4	52	0	196	123	168	191						
Legacy Seeds	L3750VT3	GQJ	163	98	25.4	54	1	206 *	124	141	182						
NuTech	3T-098AVT3	GQJ	180 *	103 *	25.4	54	0	207 *	125	178	210 *	181					
Croplan Genetics	3514VT3	GQJ	191 *	106 *	25.4	54	0	223 *	136	198 *	206 *						
Renk	RK584CBLL	KD	157	96	25.5	53	0	202 *	122	142	162						
100-DAY HYBRID TRIAL AVERAGE##					25.6												
Crows	1928R	J	165	99	25.6	52	1	203 *	124	161	173						
Croplan Genetics	421VT3	GQJ	162	98	25.7	53	0	178	120	150	200						
NuTech	3T-098VT3	GQJ	167	99	25.8	53	0	185	125	171	185	181					
Johnson Seeds	7199CBLLRW	KRD	159	97	25.8	53	0	192	118	162	163						
Jung	7454VT3	GQJ	176	102 *	26.0	53	0	205 *	126	167	205 *						
Trelay	4T722	GQJ	176	101 *	26.5	53	0	222 *	121	174	188	186					
NuTech	3T-500VT3	GQJ	169	99	26.5	52	1	202 *	127	154	193						
Kruger	K6400TS	GNJ	167	99	26.7	52	0	224 *	122	127	196						
NuTech	5N-898GTCBLLRW	KRDS	149	93	26.7	53	1	159	103	148	186						
Mycogen	2A517	LD	159	96	26.8	52	0	210 *	92	161	174						
NuTech	3C-300RRYGCB	GJ	174	101 *	27.0	52	0	198 *	129	164	203 *						
Johnson Seeds	7804RRCRW	NJ	172	99	27.4	51	1	204 *	110	170	203 *						
Gold Country	10204VT3	GQJ	181 *	103 *	27.7	52	0	217 *	135	162	212 *						
Jung	7475VT3	GQJ	191 *	105 *	28.0	52	0	209 *	128	211 *	217 *						
Jung	7514VT3	GQJ	185 *	103 *	28.7	52	0	222 *	129	175	216 *						
Legend Seeds	LS9703VT3	GQJ	175	99	30.0	52	1	183	121	185	210 *						
Dyna Gro	54T42	LJ	170	97	30.8	53	0	201 *	100	184	193						
Legend Seeds	LR9707RRHxT	PDJ	153	90	34.1	50	1	189	78	146	197						
MEAN			167	100	24.4	53	1	192	125	164	187	162	100	169	154	162	170
LSD(0.10)**			14	5	1.9	1	1	27	12	25	14	21	7	19	17	18	10

† Code = Trait(Gene): B=bmr(bm3); C=IMI(IT); D=LL(T25); F,G,K,L=Bt-ECB(Bt176, Mon810, Bt11, TC1507); H,S,J=RR(MonGA21, SYTGA21,Nk603); M=Leafy; N,P,Q,R=Bt-CRW(Mon863, DAS591227, Mon88017, MIR604); X=Unknown.

Average grain moisture of all hybrids in the trial as rated by the participating company maturity rating systems. Ratings are rounded to 5 day increments.

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

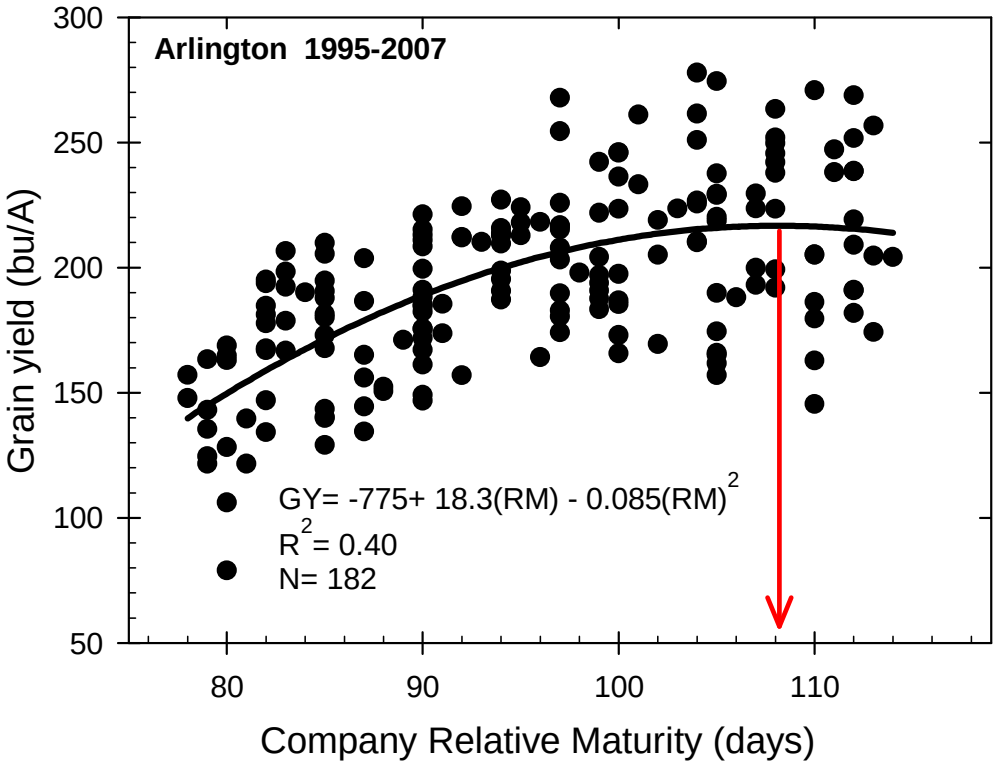
Shaded results provide the best estimate of relative hybrid performance.

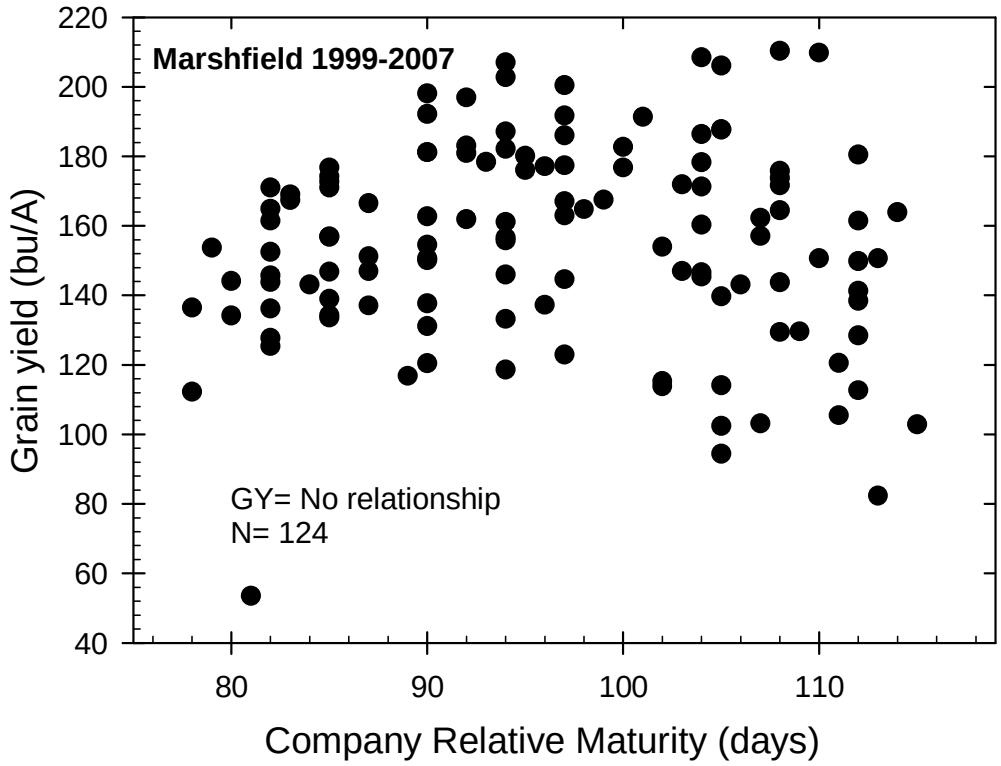
- **Hybrid maturity is likely similar within about 1-2% range in moisture.**
- **Hybrids are sorted on grain moisture.**
  - ✓ Early-, short-season hybrids listed first.
  - ✓ Late-, long-season hybrids listed last.
- **Average moisture of all xxx-day hybrids rated by the Minnesota Relative Maturity system and grown in the trial.**

Question?

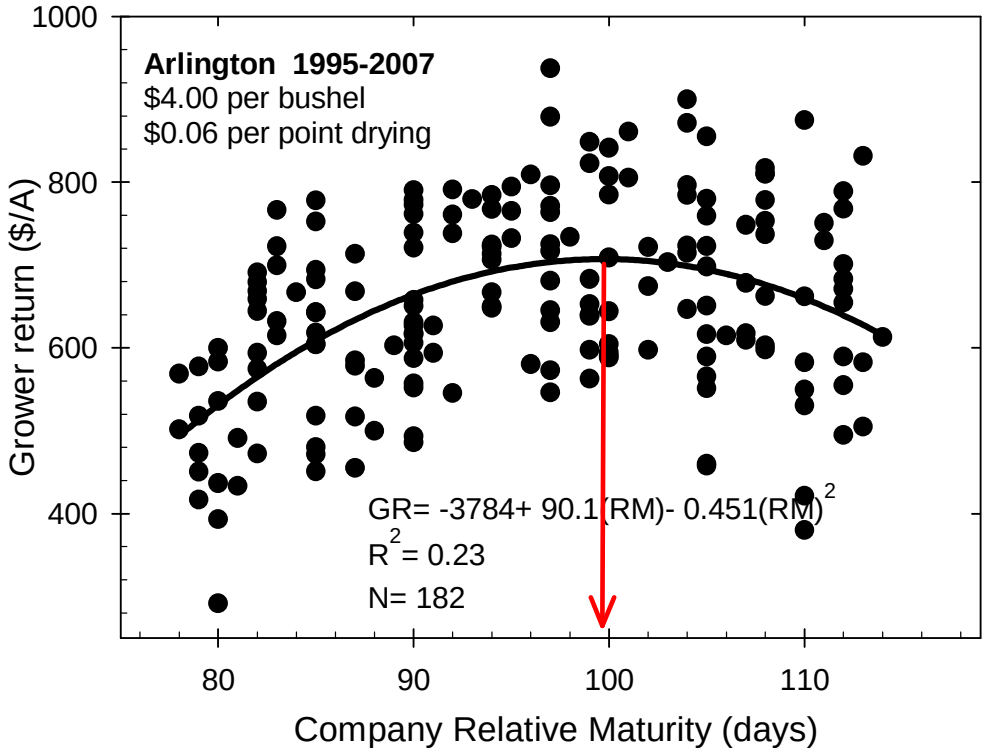
- **What proportion of you farm is planted to full-season hybrids?**
  a) 0 – 20 percent
  b) 21 – 40 percent
  c) 41 – 60 percent
  d) 61 – 80 percent
  e) 81 – 100 percent

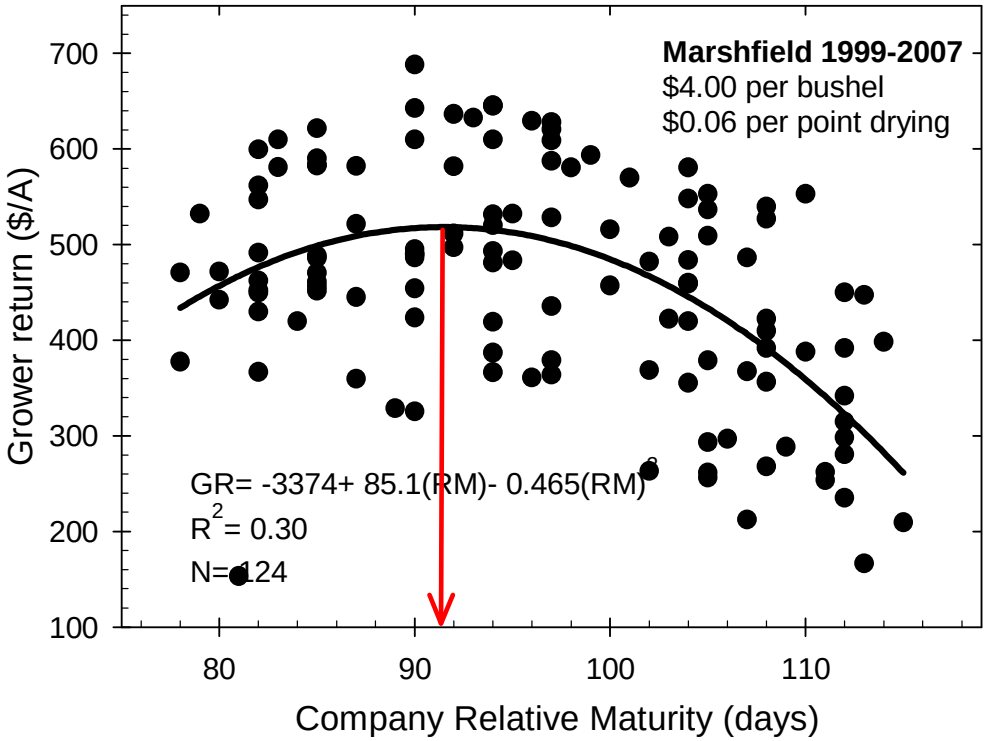
The influence of maturity on yield … longer season = greater yield … and usually more risk.





It all boils down to economics (drying cost) …





Relative maturity (days RM) for maximum grain yield and optimum economic yield in Wisconsin

Location	Years tested	N	Maximum Yield RM	Optimum Economic RM*
			days	days
Arlington	1995-2007	182	108	100
Janesville	1996-1997	30	107	105
Lancaster	1996-1997	28	112	112
Fond du Lac	1996-1997	30	103	99
Hancock	1995-2005	94	105	99
Chippewa Falls	1999-2001	42	104	---
Marshfield	1999-2004	122	---	91
Seymour	1999-2007	58	104	97
Valders	1999-2006	57	112	---

* Grain price= $4.00 per bushel, Drying cost= $0.06 per point bushel

Optimum relative maturity (days RM) for four corn production systems at Arlington (1995-2007)

System:Drying Cost ($ / point bu)	Grain price ($/bu)				
	$2.00	$3.00	$4.00	$5.00	$6.00
High energy costs:$0.06	95	98	100	101	102
Commercial:$0.04	97	100	102	103	104
On-Farm:$0.02	102	104	105	105	106
Livestock:$0.00	108	108	108	108	108

Question?

- **Do you select hybrids based upon their response to tillage system?**
  - a) Yes
  - b) No

How important is it to test hybrids in the environment it will be grown in next year?
Can we predict next year's environment ? NO
Can we test in all potential environments? Impossible

1. **Weather**
2. **Hybrid**
   - ✓ Top to bottom ranking = 0 to 30% change
   - ✓ Presence or absence of genetic traits = 0 to 100% change
3. **Date of Planting**
   - ✓ May 1 to June 1 = 0 to 30% change
   - ✓ Also need to add moisture penalty
4. **Pest Control**
   - ✓ Timeliness
   - ✓ Weeds > Insects > Diseases
   - ✓ Good v. Bad = 0 to 100% change
5. **Plant Density**
   - ✓ 32,000 to 15,000 plants/A = 0 to 22% change
   - ✓ Most potential to move off yield plateau
6. **Rotation**
   - ✓ Continuous v. Rotation = 0 to 30% change
   - ✓ Greater consequence in 'stress' environments
7. **Soil Fertility**
   - ✓ 160 v. 0 lb N/A = 20 to 50% change
8. **Harvest Timing**
   - ✓ Oct. 15 to Dec. 1 = 0 to 20% change
9. **Tillage**
   - ✓ Chisel v. No-till = -5 to 10% change
   - ✓ No-till = energy savings
   - ✓ Cultivation: Yes v. No = 0 to 10% change
10. **Row Spacing**
    - ✓ 30-inches to 15-inches = 0 to 5% change

Tillage used to be about …

1. **Controlling Weeds**
2. **Seedbed Preparation**

- **"Now, it is all about stand establishment."**
  - ✓ Excellent herbicides
  - ✓ Planter technology developments
- **Not necessary, except in continuous corn.**
- **Tillage responses more often measured in the northern corn belt.**
- **Less difference observed between tillage systems when using Round-up Ready crops.**
- **Do you have reason to suspect compaction?**
  - ✓ How was it caused? Sub-soil?

Photo by Dick Wolkowski, University of Wisconsin

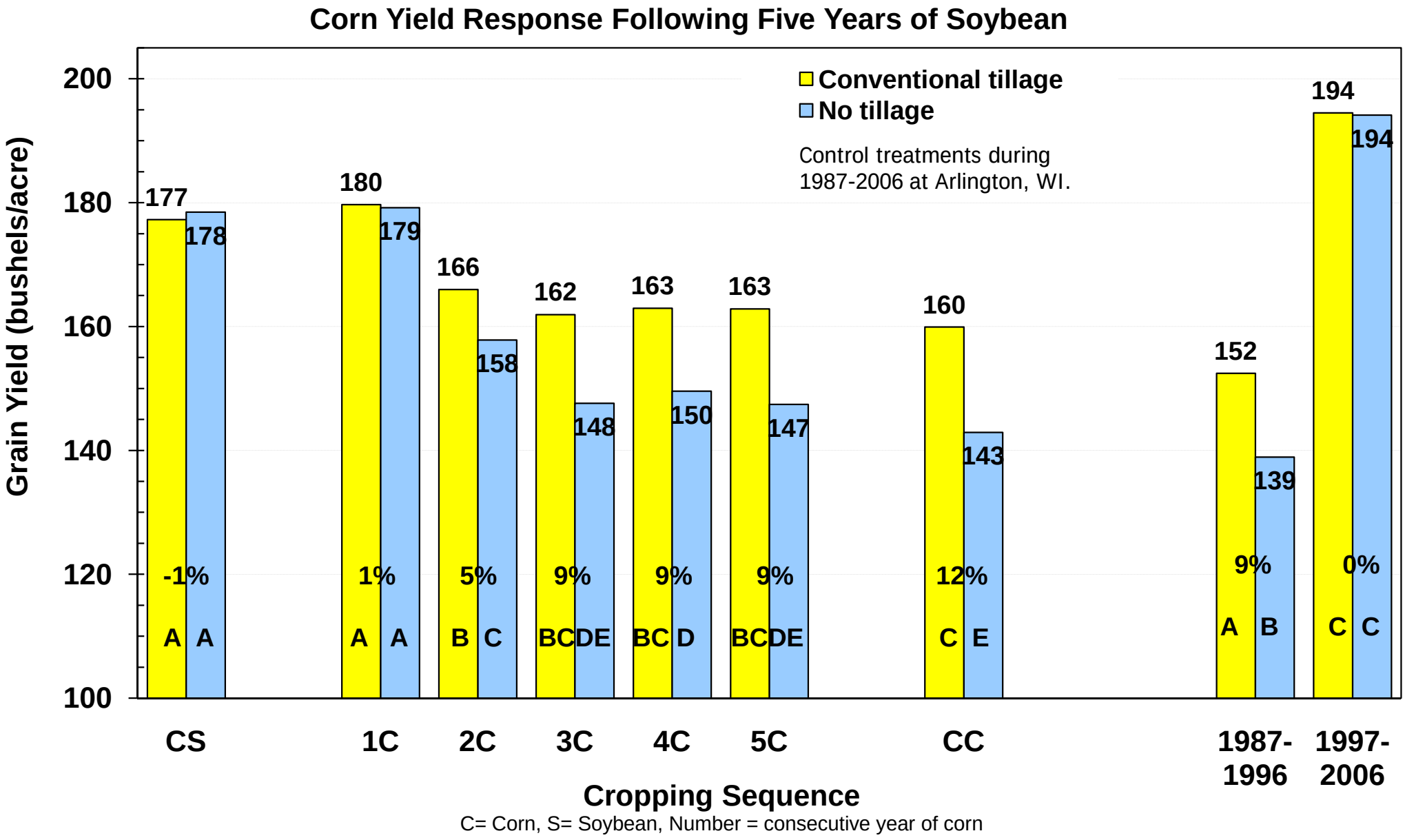
What is the yield difference between CT and NT?

- **Crops in the Midwest are challenged by:**
  - ✓ Wet springs result in lack of root surface area
    - ❑ Drainage is critical
  - ✓ Dry and hot conditions during pollination, kernel set, and grain filling
- **Short-term experiments**
  - ✓ CT produces 5-9% more than NT
- **Long-term experiments**
  - ✓ Averaged across all rotations, CT produces 7 to 10 bu/A more yield than NT
    - ❑ In CS rotation, no difference between CT and NT systems
    - ❑ In CC rotation, CT increases yield up to 17 bu/A over NT

Photo by Mahdi Al-Kaisi, Iowa State University

Tillage does not affect corn yield the first year following soybean, but improves yield 5% in the second year, and 9% in the third year ...

No tillage response is observed in the second cycle ...



Hybrid Selection Interactions with Tillage Systems

- **Difficult to predict which hybrids will respond to reduced tillage**
- **Reduce hybrid maturity slightly in NT systems.**
- **Use independent yield trial data conducted over multiple locations**
- **Focus on yield stability. Don't focus only on seed price!**

Significant	Non-significant
WI: Carter and Barnett (1987) NE: Brakke et al. (1983)	PA: Duiker et al. (2006) IA: Newhouse and Crosbie (1987) IA: Kaspar et al. (1987) IA: Newhouse and Crosbie (1986) MD: Anderson (1986) IA: Hallauer and Colvin (1985) IA: Funnermark and Hallauer (1985) IA: Newhouse (1985) SC: Karlen and Sojka (1985) IA: Mock and Erbach (1977)

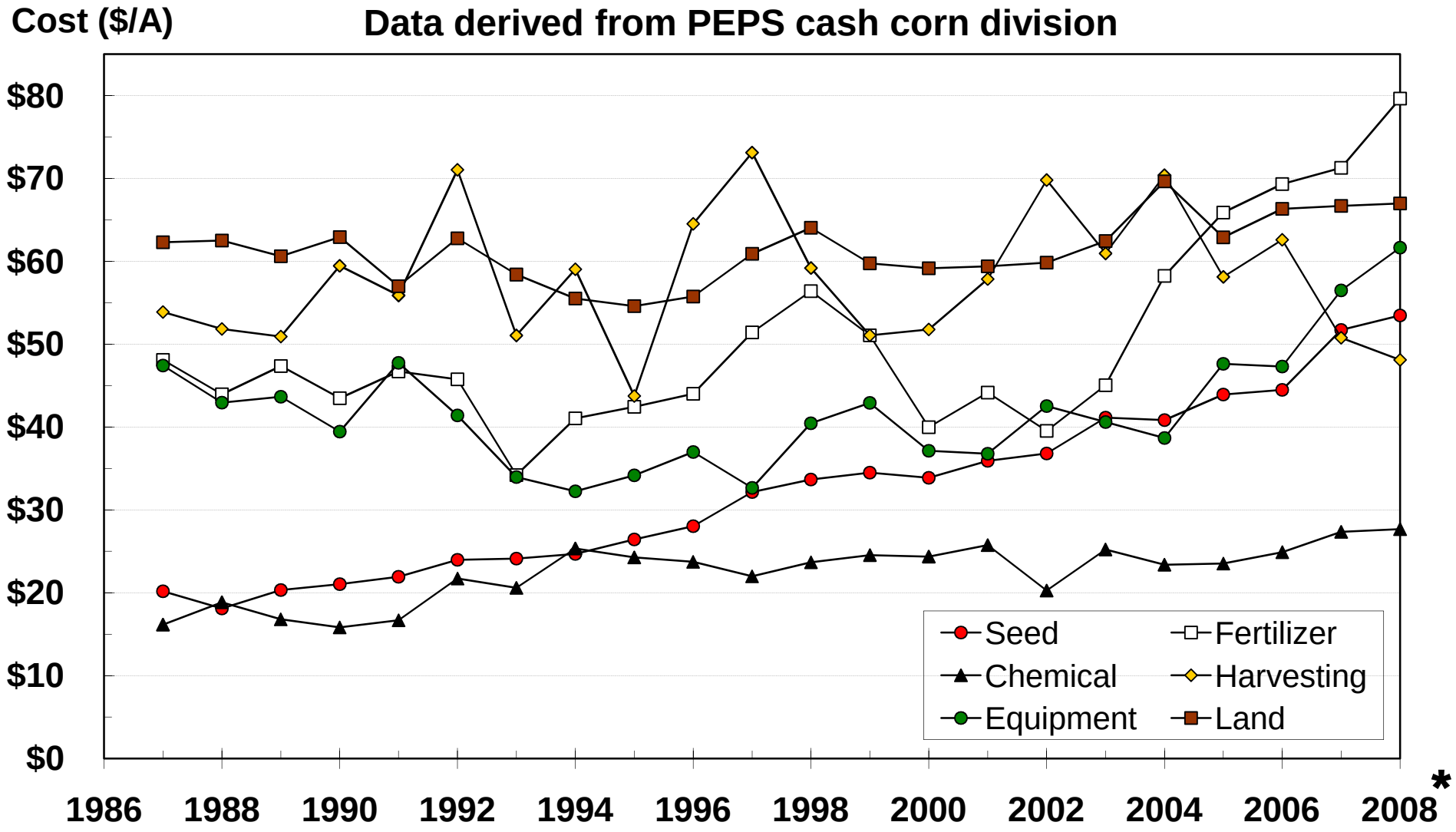
Question?

- **What is an average price for a bag of corn seed on your farm this year?**
  - a) < $100
  - b) $101 - $150
  - c) $151 - $200
  - d) $201 - $250
  - e) $251 - $300
  - f) > $301

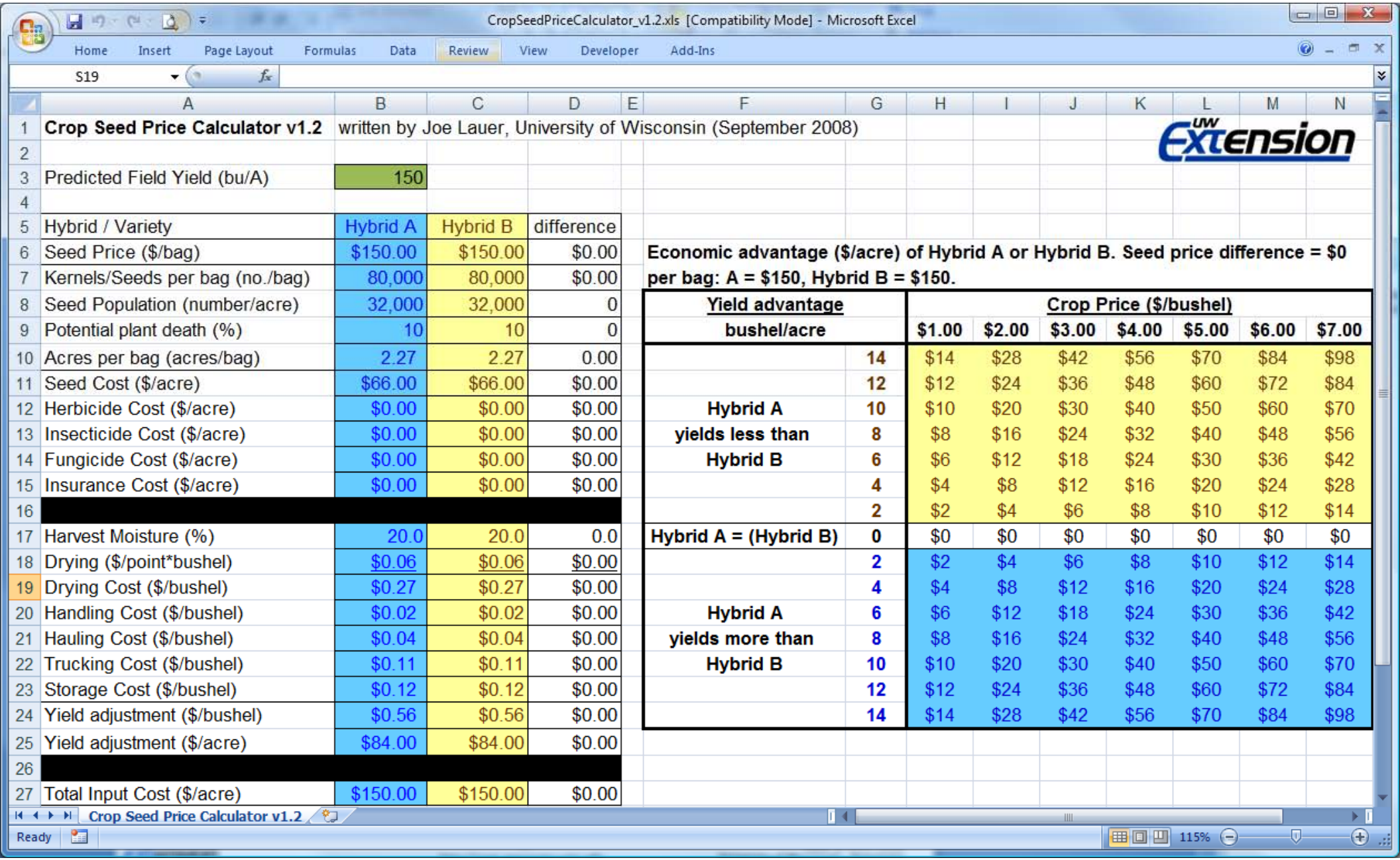
PEPS

Average corn production costs for major inputs

(* = projected)



Spreadsheet for Calculating Seed Costs



CropSeedPriceCalculator_v1.2.xls [Compatibility Mode] - Microsoft Excel

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Crop Seed Price Calculator v1.2 written by Joe Lauer, University of Wisconsin (September 2008)

UW Extension

Predicted Field Yield (bu/A)	150		
Hybrid / Variety	Hybrid A	Hybrid B	difference
Seed Price ($/bag)	$150.00	$150.00	$0.00
Kernels/Seeds per bag (no./bag)	80,000	80,000	$0.00
Seed Population (number/acre)	32,000	32,000	0
Potential plant death (%)	10	10	0
Acres per bag (acres/bag)	2.27	2.27	0.00
Seed Cost ($/acre)	$66.00	$66.00	$0.00
Herbicide Cost ($/acre)	$0.00	$0.00	$0.00
Insecticide Cost ($/acre)	$0.00	$0.00	$0.00
Fungicide Cost ($/acre)	$0.00	$0.00	$0.00
Insurance Cost ($/acre)	$0.00	$0.00	$0.00
Harvest Moisture (%)	20.0	20.0	0.0
Drying ($/point*bushel)	$0.06	$0.06	$0.00
Drying Cost ($/bushel)	$0.27	$0.27	$0.00
Handling Cost ($/bushel)	$0.02	$0.02	$0.00
Hauling Cost ($/bushel)	$0.04	$0.04	$0.00
Trucking Cost ($/bushel)	$0.11	$0.11	$0.00
Storage Cost ($/bushel)	$0.12	$0.12	$0.00
Yield adjustment ($/bushel)	$0.56	$0.56	$0.00
Yield adjustment ($/acre)	$84.00	$84.00	$0.00
Total Input Cost ($/acre)	$150.00	$150.00	$0.00

Economic advantage ($/acre) of Hybrid A or Hybrid B. Seed price difference = $0 per bag: A = $150, Hybrid B = $150.

Yield advantage bushel/acre		Crop Price ($/bushel) $1.00	$2.00	$3.00	$4.00	$5.00	$6.00	$7.00
	14	$14	$28	$42	$56	$70	$84	$98
	12	$12	$24	$36	$48	$60	$72	$84
Hybrid A	10	$10	$20	$30	$40	$50	$60	$70
yields less than	8	$8	$16	$24	$32	$40	$48	$56
Hybrid B	6	$6	$12	$18	$24	$30	$36	$42
	4	$4	$8	$12	$16	$20	$24	$28
	2	$2	$4	$6	$8	$10	$12	$14
Hybrid A = (Hybrid B)	0	$0	$0	$0	$0	$0	$0	$0
	2	$2	$4	$6	$8	$10	$12	$14
	4	$4	$8	$12	$16	$20	$24	$28
Hybrid A	6	$6	$12	$18	$24	$30	$36	$42
yields more than	8	$8	$16	$24	$32	$40	$48	$56
Hybrid B	10	$10	$20	$30	$40	$50	$60	$70
	12	$12	$24	$36	$48	$60	$72	$84
	14	$14	$28	$42	$56	$70	$84	$98

Crop Seed Price Calculator v1.2

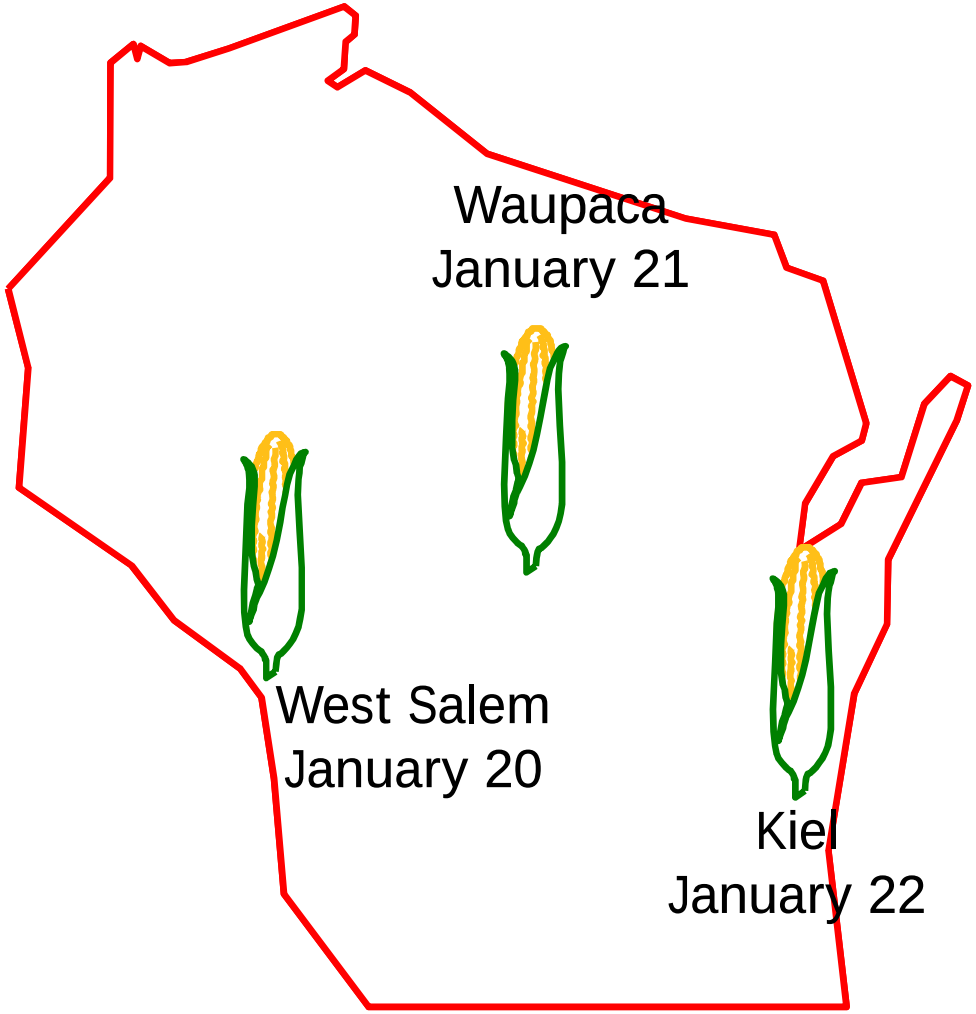
Ready 115%

Summary

- **With the demise of the Minnesota Relative Maturity Rating system, the corn industry has no standard for rating corn.**
  - ✓"Buyer beware"
- **Drying costs impact the optimum RM more than corn price.**
  - ✓Drying = up to 13 days RM while corn price = up to 7 days RM
- **Choose hybrids based upon multi-location averages and consistency of performance rather than a specific situation.**
  - ✓For tillage systems, most evidence suggests very little interaction.
  - ✓Tendencies may be known by company, but not likely due to rapid turnover.
- **Corn seed price AND relative performance influence the hybrid selection decision.**

Thanks for your attention!
Questions?

2009 Corn Conferences



WISCONSIN Corn/Soy EXPO

PEPS

January 29-30, 2009
Kalahari Resort
Wisconsin Dells, WI