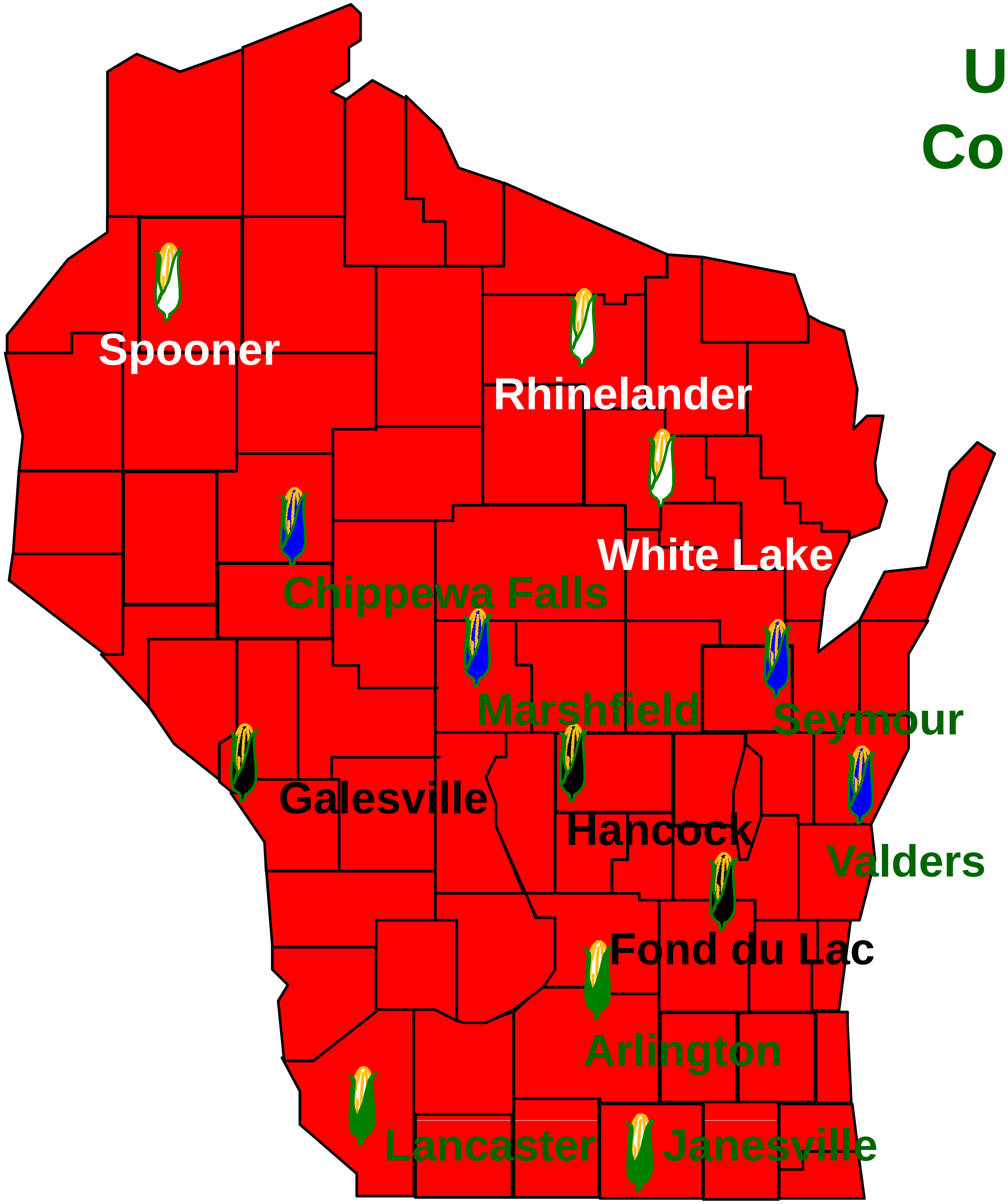
Overview for Agronomy Update Meetings 2003

- Review of 2002 corn production season
  - ✓ Changes to UW Corn Agronomy program
  - ✓ Top corn hybrid performances
  - ✓ Transgenic hybrids
- Risk in Agronomic Decisions
  - ✓ Calculating grower return
  - ✓ Plant density
  - ✓ Planting date and hybrid maturity switch dates
  - ✓ Corn – Soybean Rotations
- Summary and Looking Ahead to 2003

Corn Observations For 2002

Corn plots on 5 June at Galesville, WI

- ✓ High corn yields in western WI.
- ✓ Spring planting conditions were warm and dry during April, followed by cool and wet weather during early May resulting in an overall slow start for corn. Growth caught up by early July with hot, dry weather.
- ✓ For the second year in a row, drought conditions existed during the pollination and grain-filling periods in the northeast.
- ✓ Timely rains in western Wisconsin resulted in favorable pollination conditions.
- ✓ Corn silage harvest started slightly later than normal.
- ✓ Killing frost did not occur until mid-October.
- ✓ Excellent plant standability was observed in most trials.



University of Wisconsin Corn Agronomy Program

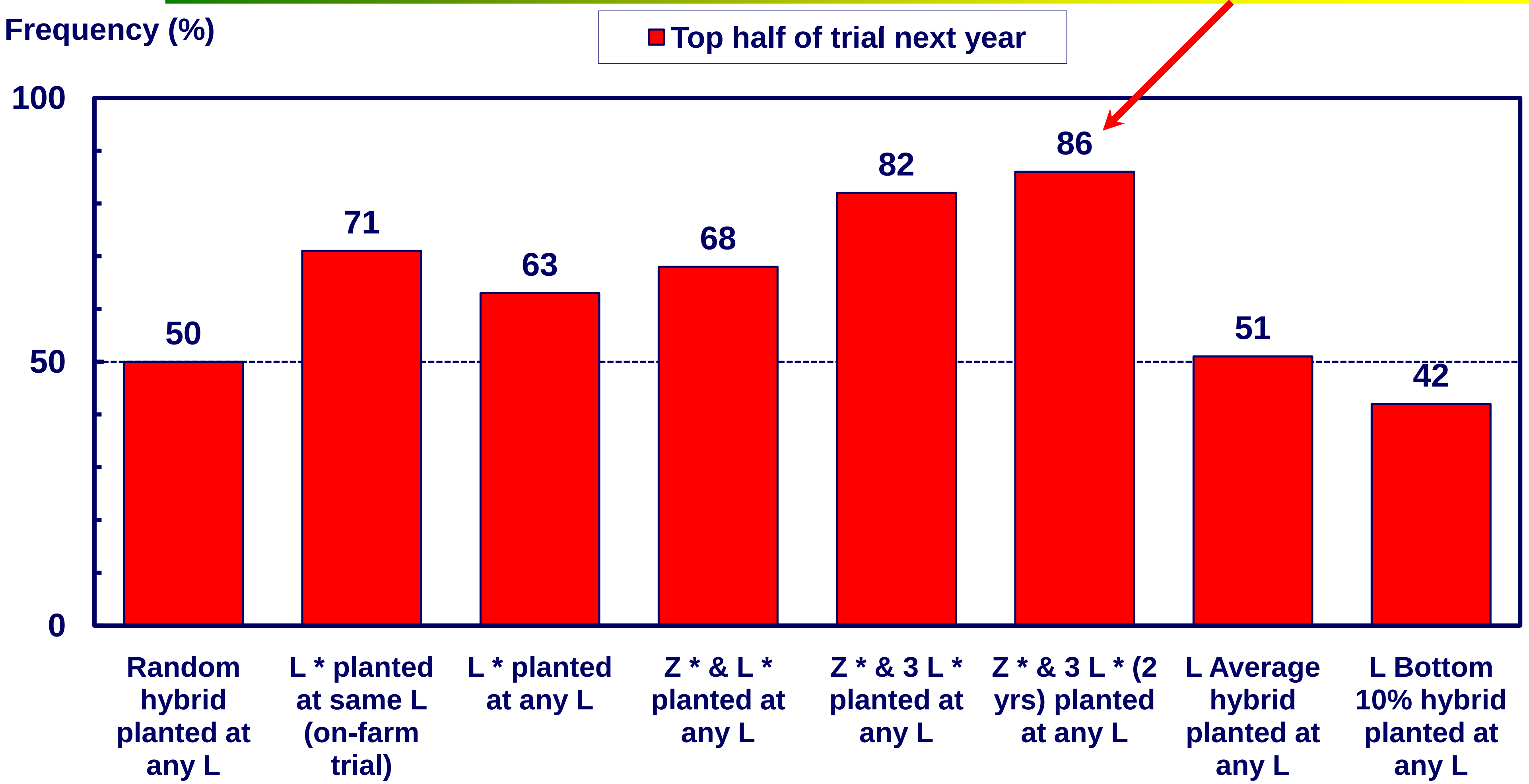
New for 2002

Added corn silage test sites in Chippewa Falls, Rhinelander, and Spooner. Dropped Ashland site.

Hybrid names on silage trial graphs

Two-year average calculated for yield in grain and silage programs.

Hybrid Selection Strategies Using WI Results 1973-1998 (L=Location, Z=Zone)



2002 Wisconsin Corn Performance Trials
Grain Summary

Location	1992-2001 N	1992-2001 Yield	2002 N	2002 Yield	Percent change
Arlington	1846	196	173	191	-3
Janesville	1846	189	175	194	3
Lancaster	1846	177	175	206	16
Fond du Lac	1628	166	148	184	11
Galesville	1628	163	148	214	31
Hancock	1627	183	148	229	25
Chippewa Falls	1508	151	150	156	3
Marshfield	1199	149	150	199	34
Seymour	1117	151	74	171	13
Valders	1508	144	150	137	-5
Spooner	1869	129	120	158	22
White Lake	624	95	40	145	53

Note: Seymour average includes New London - 1992.

Top 10 Corn Grain Hybrids in the Southern Production Zones during 2002

Hybrid	Yield	Moisture	Hybrid	Yield	Moisture
Southern zone	bu/A	%	**South central zone**	bu/A	%
Dekalb DKC6019	236	25.8	Crows C217B *	241	23.5
Agrigold A6333Bt	235	23.9	Pioneer 36R11 *	241	23.6
Pioneer 33A14	227	27.7	Lemke 6068Bt *	241	30.2
Pioneer 34N44	225	25.0	Kaltenberg K5151Bt *	240	23.4
Dekalb DKC5878	224	22.5	Pioneer 35Y55 *	240	26.4
Wyffels W7273	224	26.1	Midwest G7101B *	240	23.1
Jung 6710Bt	223	26.2	Cargill 4521Bt	238	23.3
Agrigold A6395	222	23.4	Dahlman D5102Bt	238	23.0
Garst / Agripro 9476Bt	222	23.8	Dahlco X1021Bt	238	23.1
Kussmaul K408	222	24.4	High Cycle 7525Bt	237	23.3

* = Top 50 Corn Hybrid Performances since 1972 in Wisconsin

Top 10 Corn Grain Hybrids in the Northern Production Zones during 2002 (* = Zone Top 10 "All Time")

Hybrid	Yield	Moisture	Hybrid	Yield	Moisture
North central zone	bu/A	%	**Northern zone**	bu/A	%
Pilgrim Seed 8601	199	26.7	Pioneer 38A25 *	196	34.2
Dahlman D4515	198	25.6	Kaltenberg K2727Bt *	180	31.6
Dekalb DKC4446	195	27.2	Pioneer 38P06 *	176	31.5
NK Brand N32L9	191	26.6	NK Brand N2555BT	171	32.2
LG Seeds LG2442	191	26.1	Pioneer 39K42	170	31.1
Dekalb DKC4628	190	27.3	Dahlco 2075Bt	169	36.4
Dekalb DKC4442	189	27.9	Dairyland Stealth 1089Bt	168	32.7
Dahlco X1021Bt	189	28.9	Growmark FS1762	168	30.8
Growmark FS4042Bt	189	29.1	Golden Harvest H6675	168	31.7
Carharts Blue Top CR102RB	188	28.3	Renk RK232Bt	167	32.8

* = Top 10 Corn Hybrid Performance in the Zone

2002 Wisconsin Corn Performance Trials
Silage Summary

Location	1992-2001 N	1992-2001 Yield	2002 N	2002 Yield	Percent change
Arlington	438	9.4	56	8.8	-7
Lancaster	386	7.8	56	8.6	10
Fond du Lac	352	8.6	65	8.7	1
Galesville	352	8.3	65	9.8	18
Chippewa Falls	4	7.3	53	8.0	8
Marshfield	408	6.8	53	8.0	18
Valders	387	6.7	53	5.5	-18
Rhinelander			17	7.0	
Spooner			34	8.3	

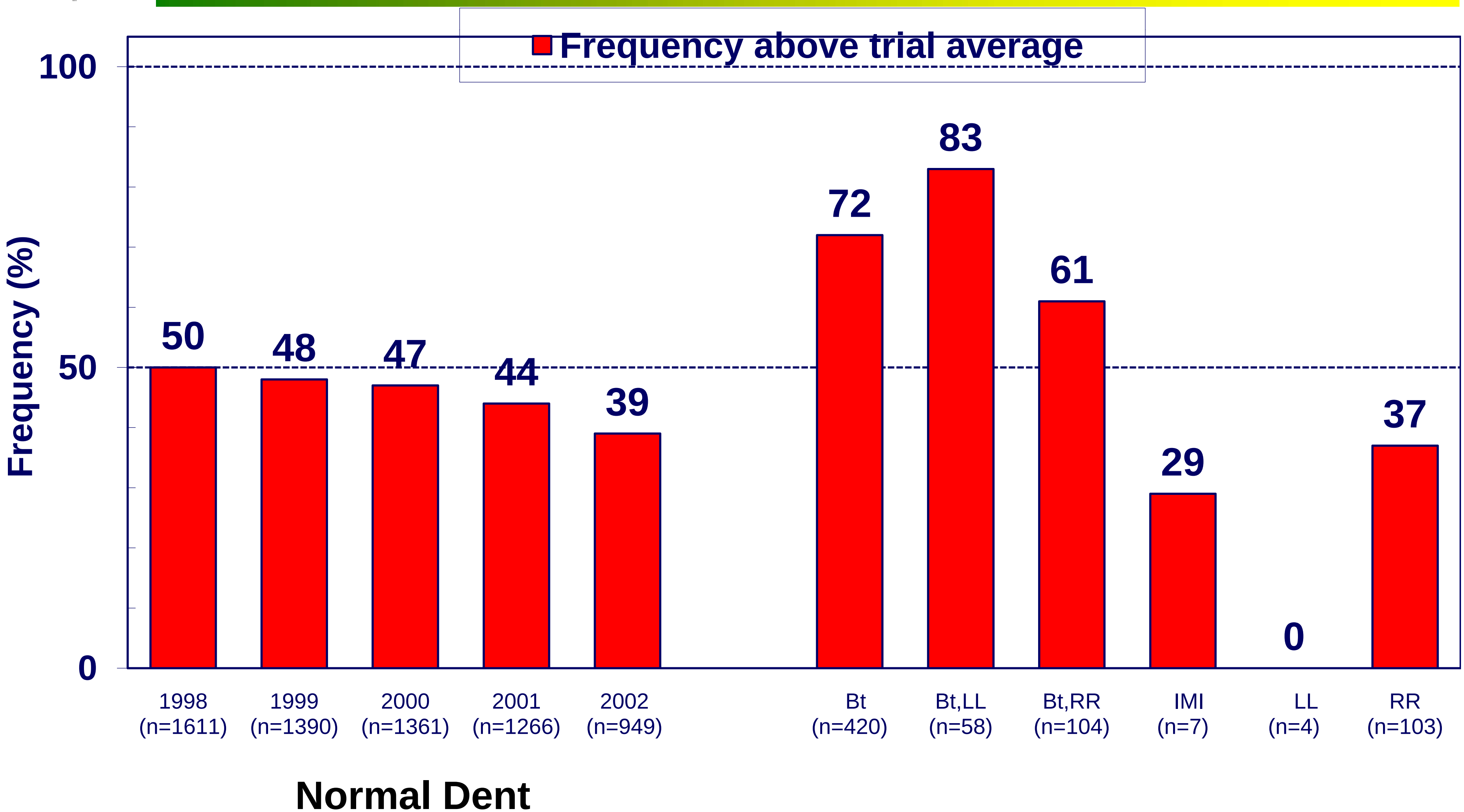
Top 10 Corn Silage Hybrids in the Southern Production Zones during 2002

Hybrid	Yield	Hybrid	Yield
Southern zone	T/A	**South central zone**	T/A
Pioneer 34M95 *	10.7	Pioneer 34M95 *	11.0
Cornelius C590YG	10.3	NK Brand N48V8 *	10.6
Golden Harvest H8662Bt	10.0	Carharts Blue Top CX1020B *	10.5
Spangler LFT61	9.9	Pioneer 35R58 *	10.4
High Cycle HC540	9.9	Garst 8523IT	10.3
NK Brand N65Y3	9.9	Lemke 6068Bt	10.2
NK Brand N48V8	9.8	Dahlco 2660	10.2
Spangler 7558G	9.8	Trelay 7095	10.2
Growmark FS6533Bt	9.7	NK Brand N59Q9	10.2
Asgrow RX708YG	9.5	Brunner S6408Bt	10.2

Top 10 Corn Silage Hybrids in the Northern Production Zones during 2002

Hybrid	Yield	Hybrid	Yield
North central zone	T/A	**Northern zone**	T/A
Pioneer 35R58	8.4	Pioneer 38T28	9.0
Growmark FS4322	8.3	Pioneer 37D03	8.7
Pioneer 35D45	8.3	Carharts Blue Top CX8500A	8.3
Lemke 4031	7.9	Pioneer 37R71	8.3
Dekalb DKC4446	7.9	Geertson GS961	8.3
NK Brand N45T5	7.8	Kaltenberg K2727Bt	8.1
NK Brand N48V8	7.8	Ragt Semences RH0027	8.0
Dekalb DKC5334	7.8	Carharts Blue Top CR8500R	8.0
Dahlco X0012	7.7	Golden Harvest H6355	7.8
NK Brand NX3360	7.7	NK Brand N2555BT	7.8

Frequency of Specialty Hybrids Yielding Above Average in the 2002 WI Hybrid Trials



SELECT

Computer Software for Choosing Crop Varieties

http //corn.agronomy.wisc.edu

Calculating Grower Return

Grower return = (Yield x Price)
- Handling ($0.02 per bushel)
- Hauling ($0.04 per bushel)
- Trucking ($0.11 per bushel)
- Drying ($0.02 per bushel-point above 15.5%)
- Storage ($0.02 per 30 day)
- Seed ($100 per bag) *for plant density*

Marketing plan: 50% sold at harvest, 25% at 4 months, and 25% at 8 months.

gr250: Price per bushel = $2.50

Livestock: $0.00 drying, $0.00 trucking, $0.01 storage

On-farm: $0.02 drying, $0.02 storage

Commercial: $0.04 drying, $0.03 storage

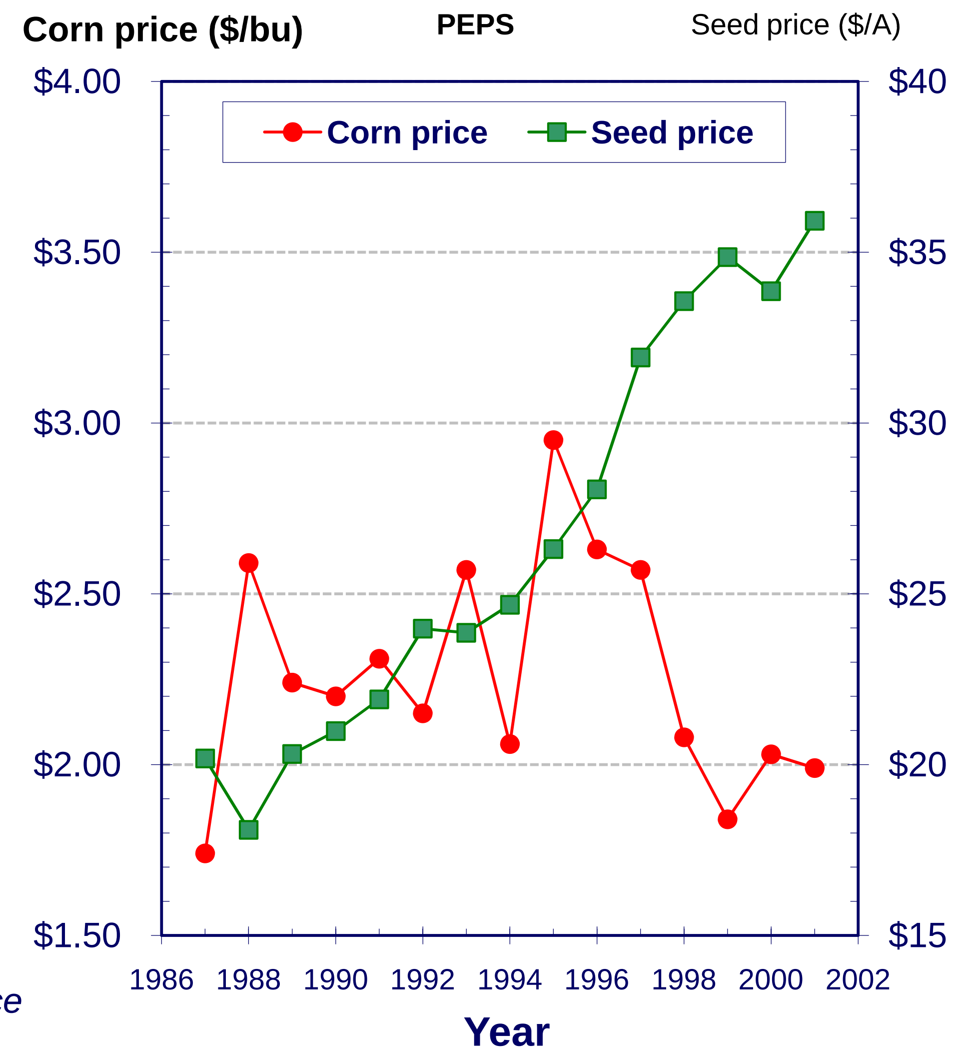
grPEPS: Weighted Price per bushel

= 50% November Average Cash price

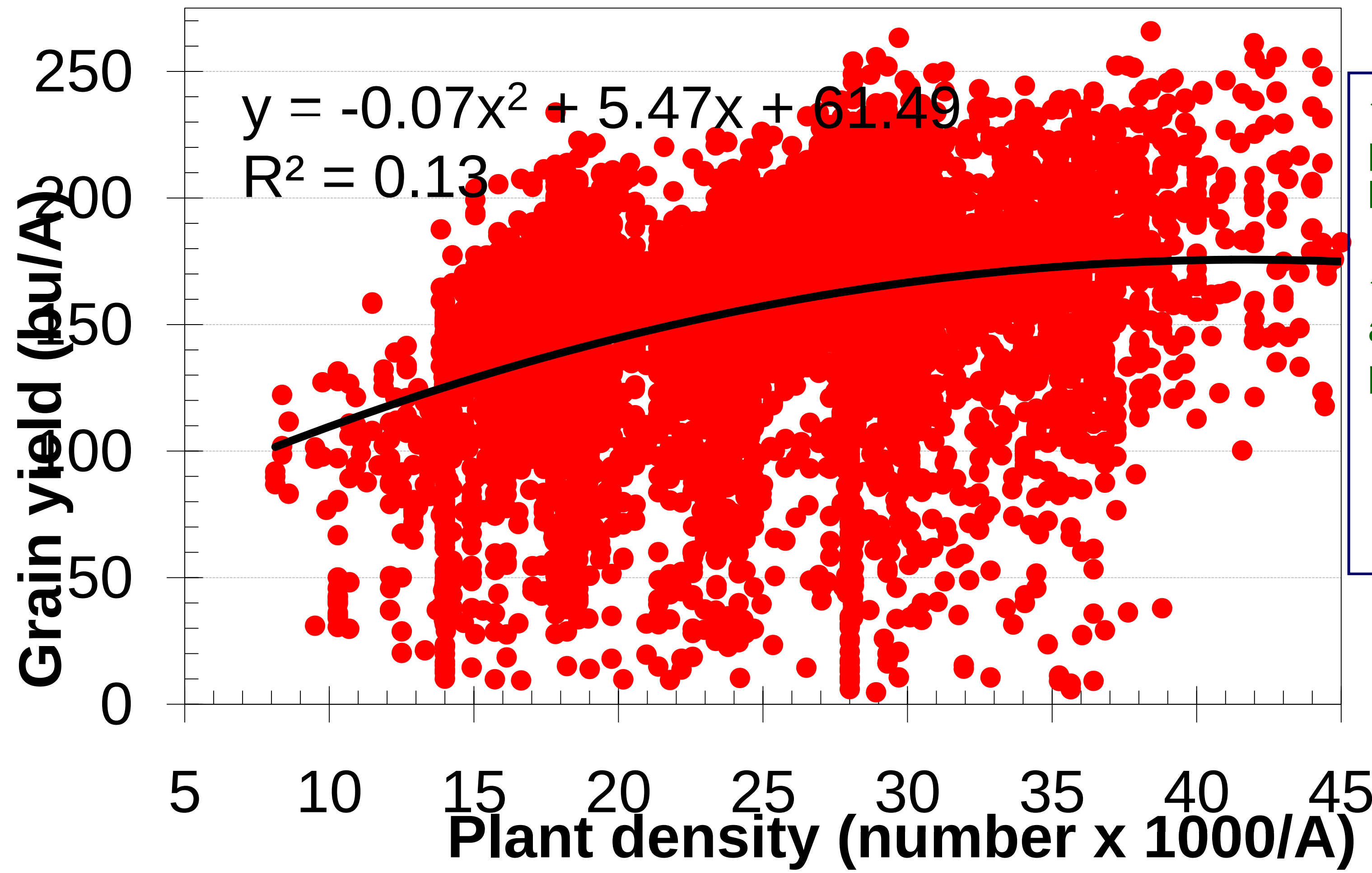
+ 25% March CBOT Futures ($0.15 basis)

+ 25% July CBOT Futures ($0.10 basis)

November Average Cash price derived from WI Ag Statistics; CBOT Futures prices derived from closing price on first business day in December.



Relationship between grain yield and plant density for corn grown between 1987 and 2001 in Wisconsin (n = 7811 plots)



✓What is the optimum plant density at a location?

✓What is the risk associated with higher plant densities?

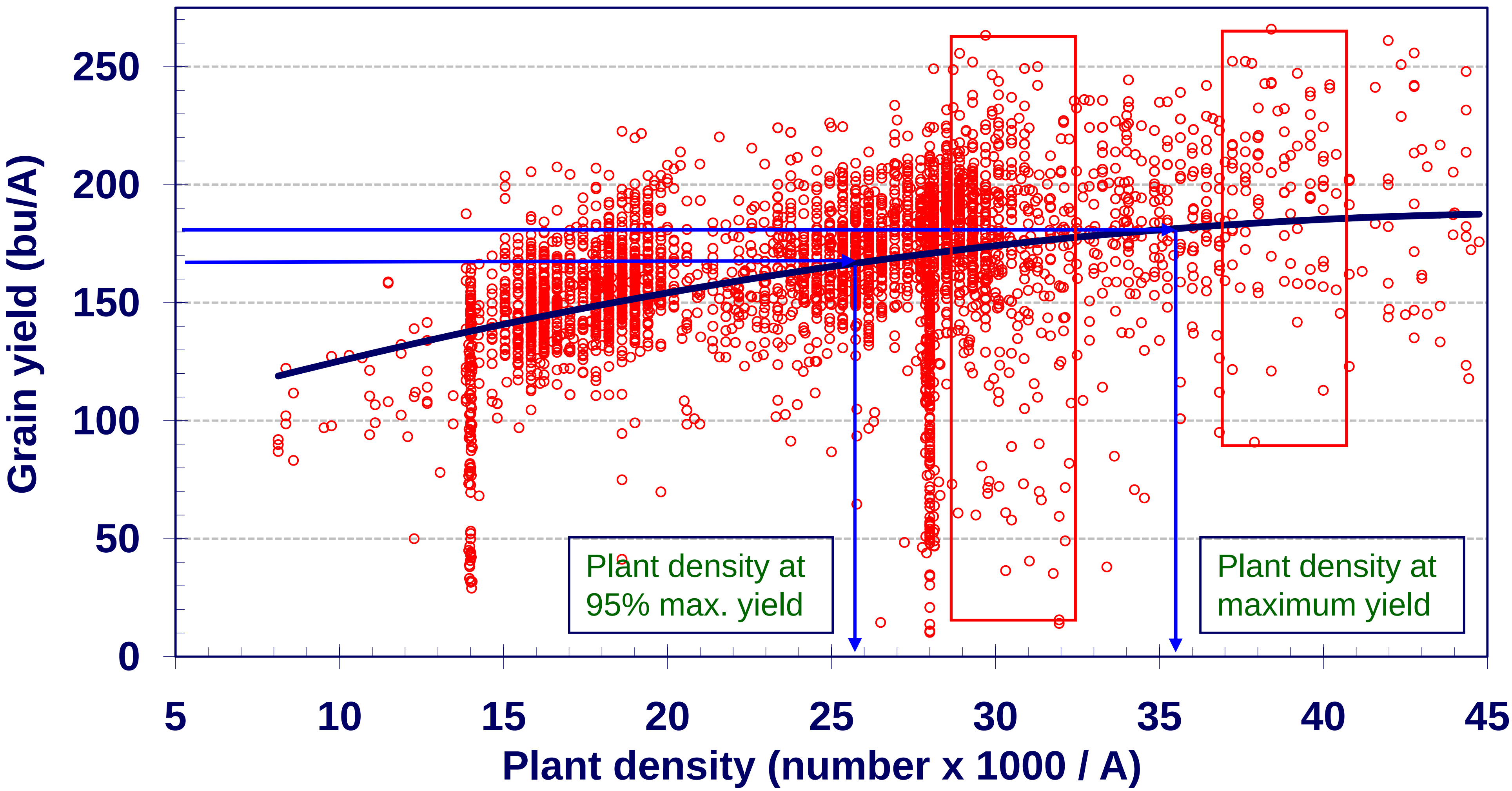
- Seed cost
- Lodging potential
- Diseases

Data set used to analyze corn response to plant density in Wisconsin (plots)

Location	N	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987
Arlington	3552	85	94	103	102	186	245	96	128	124	126	312	258	930	816		32
Ashland	144													96			48
Chippewa Falls	139	30					31						36	36		36	
Fond du Lac	230	30			32	31	71						24	24	24	24	
Galesville	96	30											24	24	24	24	
Hancock	215	30						71				24	48	24	24	24	
Janesville	1238	30			30	32	18					96	84	930	24	24	
Lancaster	228	30						72					84	24	24	24	
Marshfield	252	30										108	36	36	36	36	
New London	107													36	35	36	
Spooner	432	30											96	96	96	48	96
Valders	186	30			30	30	18						36	36	36		

Analyzed a total of 120 locations in 21 states and provinces in the Corn Belt (n= 52,848 plots).

Relationship between plant density and grain yield for corn grown between 1987 and 2001 at Arlington, WI (n = 3552 plots)



Plant density at maximum yield and 95% of maximum yield

	Maximum		95% of Maximum	
Location	Yield	Plant density	Yield	Plant density
	bu/A	x1000/A	bu/A	x1000/A
Arlington	177	35.8	168	25.7
Janesville	184	32.7	175	23.9
Lancaster	157	32.0	150	24.4
Fond du Lac	168	37.8	160	26.4
Galesville	194	38.8	184	28.2
Hancock	189	43.6	180	38.8
Chippewa Falls	137	43.0	130	28.5
Marshfield	125	37.2	118	31.1
New London	163	37.2	155	32.3
Valders	164	42.9	156	30.4
Ashland	85	32.7	80	28.2
Spooner	113	28.6	107	22.2

✓At five of six northern sites, the relationship between yield and plant density was linear, i.e. yield continued to increase throughout range of plant densities studied.

✓Average plant density range between maximum and 95% of max= 8500 plants/A

Plant Density at Maximum Grower Return and 95% of Maximum Grower Return

Location	Corn price = $2.50 Maximum return	 95% of Maximum	Corn price = PEPS Maximum return	 95% of Maximum
	x1000/A	x1000/A	x1000/A	x1000/A
Arlington	32.0	22.4	35.5	26.0
Janesville	29.8	21.2	32.2	23.6
Lancaster	29.6	22.4	32.0	25.0
Fond du Lac	33.1	22.1	37.6	26.6
Galesville	34.2	24.7	37.6	27.9
Hancock	43.6	37.3	43.6	39.3
Chippewa Falls	NS	NS	43.0	26.6
Marshfield	37.2	19.3	37.2	30.8
New London	37.2	30.1	37.2	32.7
Valders	37.2	25.7	42.1	30.6
Ashland	NS	NS	32.7	27.4
Spooner	NS	NS	28.6	21.9

✓Optimum plant densities are lower for $2.50 corn price than for yield or PEPS price.

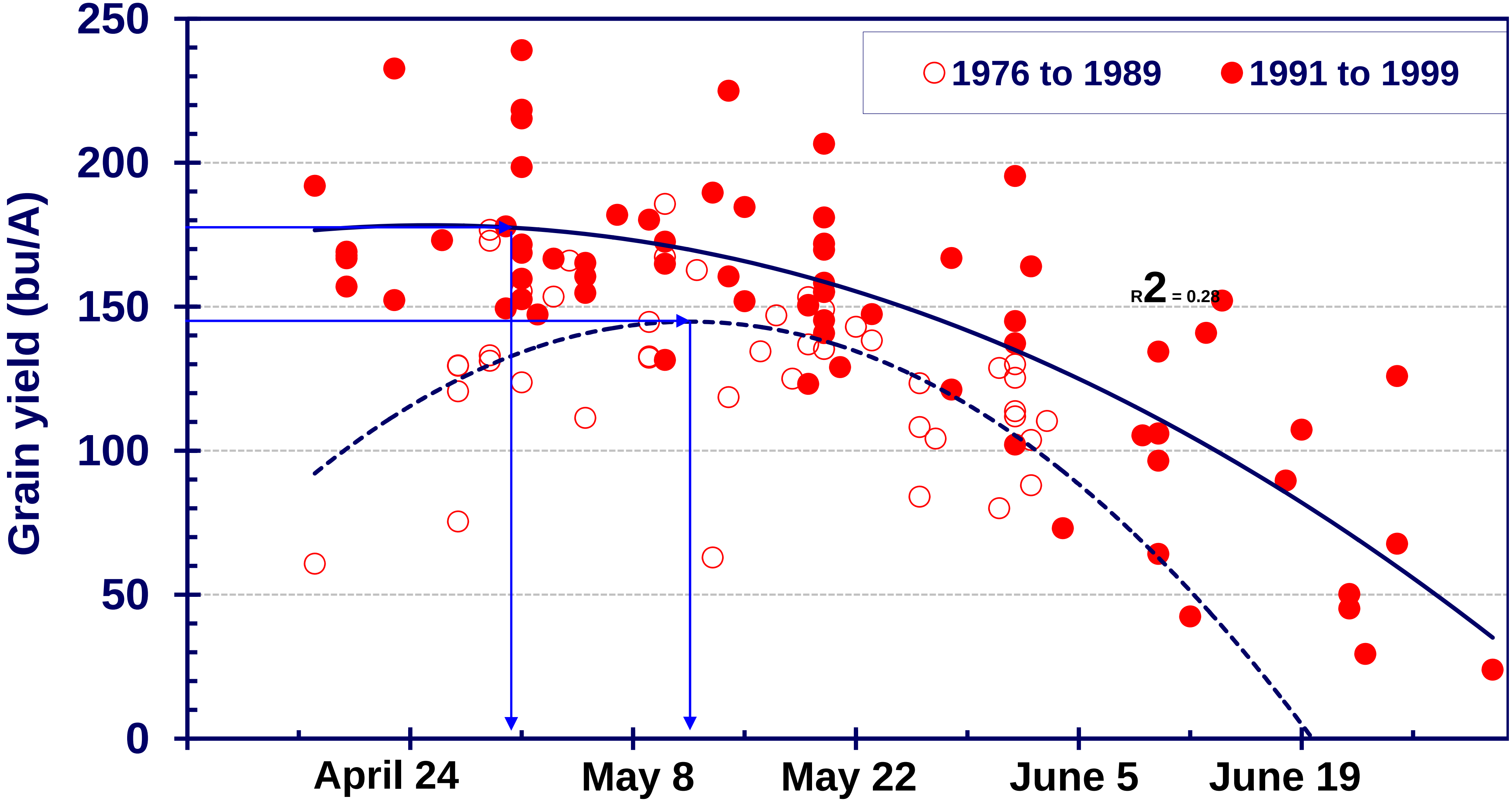
✓Average plant density range between maximum and 95% of max=
gr250: 9900 plants/A
PEPS: 8400 plants/A

✓For 6 of 12 sites trend is linear. Most are in northern WI

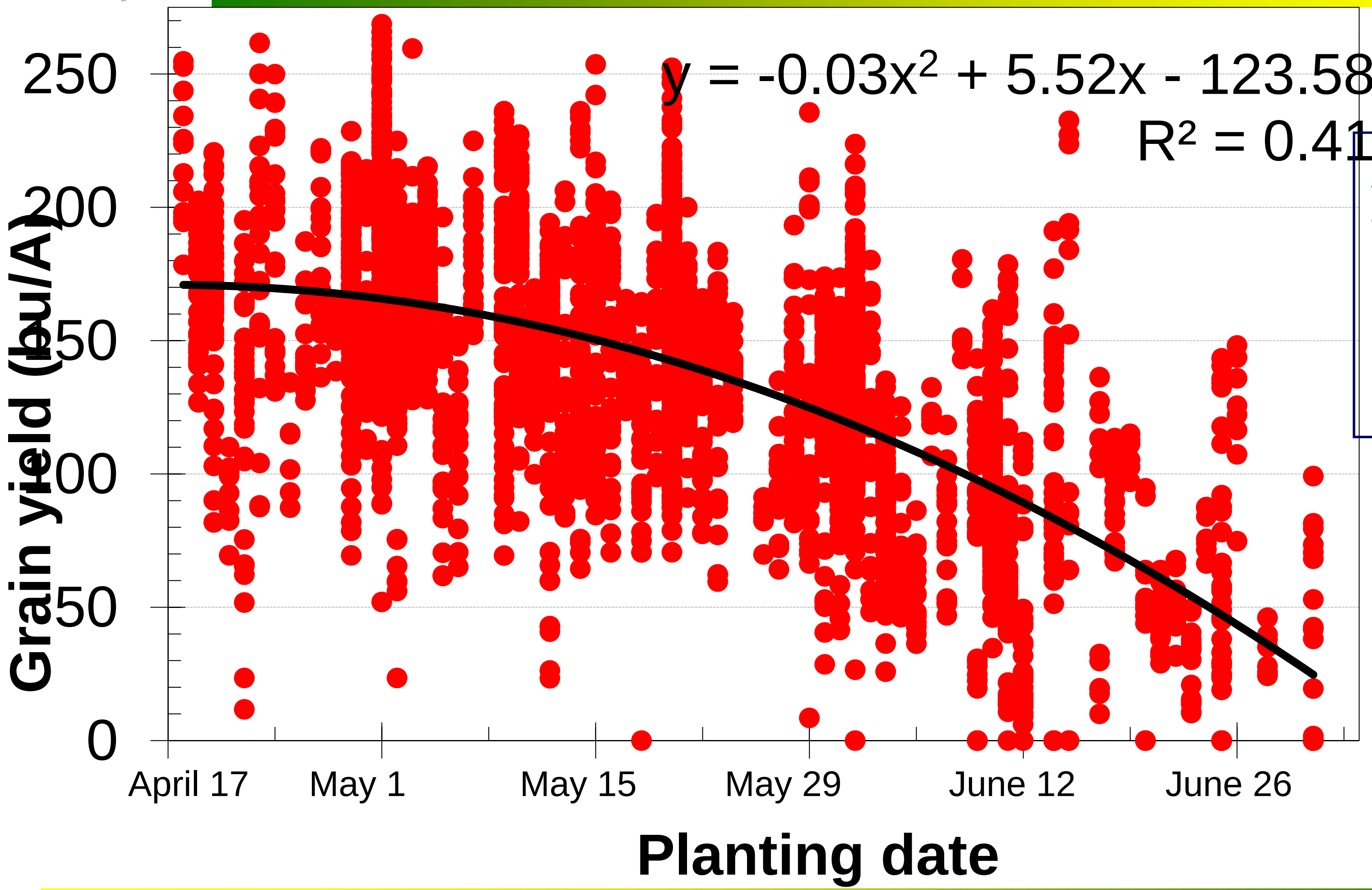
The Relationship between Yield and Grower Return Risk and Plant Density

	Yield			price = $2.50			price = PEPS		
Location	Maximum	95% of maximum	45000 plants/A	Maximum	95% of maximum	45000 plants/A	Maximum	95% of maximum	45000 plants/A
		± bu/A			± $/A			± $/A	
Arlington	9.6	8.7	10.2	14	13	125	13	12	107
Janesville	7.8	7.5	8.4	11	11	77	11	10	37
Lancaster	NS	NS	NS	NS	NS	NS	NS	NS	NS
Fond du Lac	7.6	6.3	9.1	11	9	95	10	9	60
Galesville	8.5	7.5	9.1	13	11	91	12	11	81
Hancock	9.5	8.8	9.8	14	13	101	14	13	191
Chippewa Falls	NS	NS	NS	NS	NS	NS	12	9	218
Marshfield	NS	NS	NS	NS	NS	NS	NS	NS	NS
New London	7.8	7.4	8.4	12	11	80	11	11	79
Valders	NS	NS	NS	NS	NS	NS	NS	NS	NS
Ashland	9.6	8.8	11.5	13	12	129	12	11	103
Spooner	8.0	7.3	9.6	12	11	98	11	10	88

Corn grain yield response to planting date at Arlington, WI

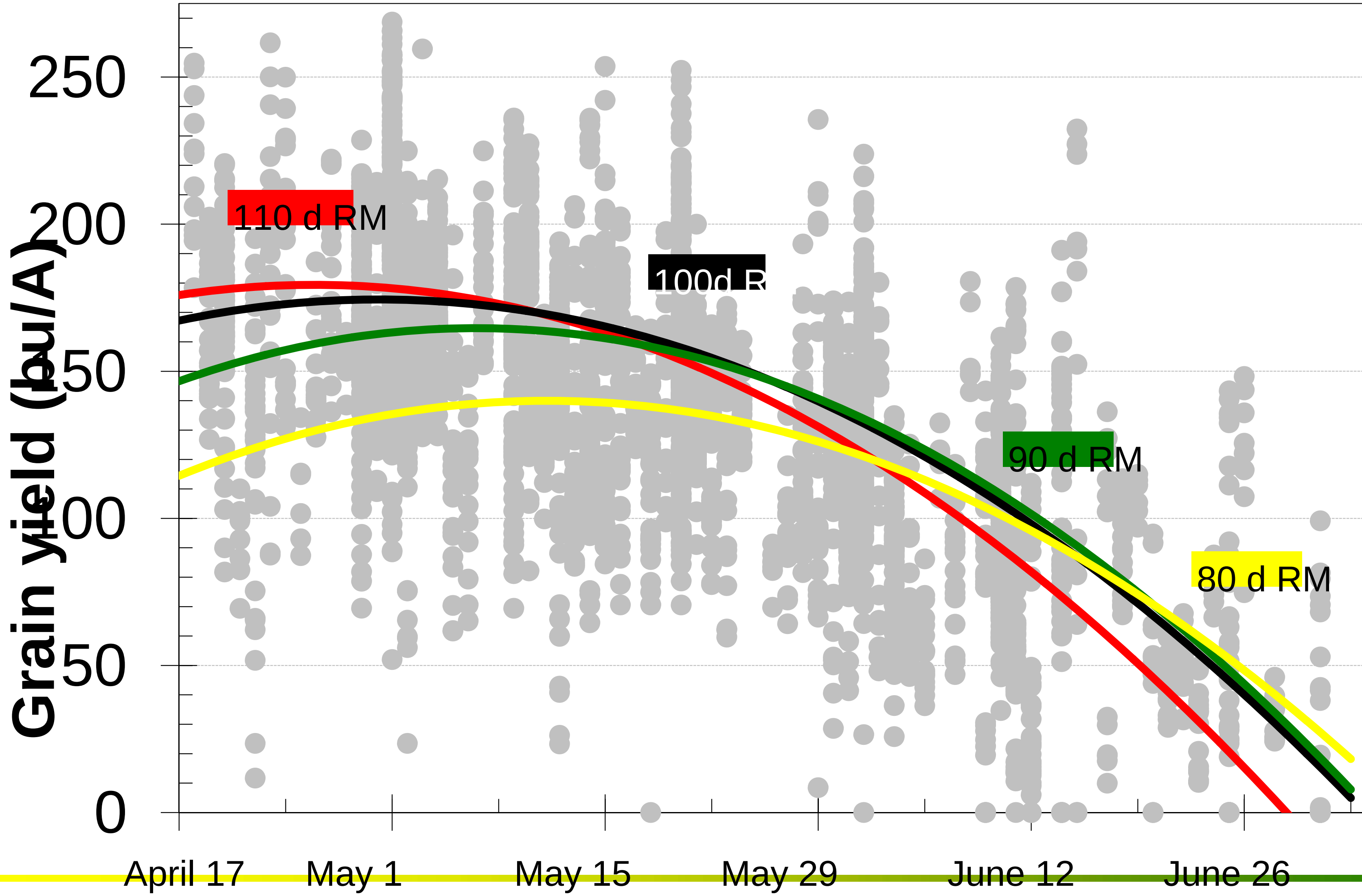


Relationship between grain yield and planting date for corn grown between 1974 and 2001 in Wisconsin (n = 2,928 plots)

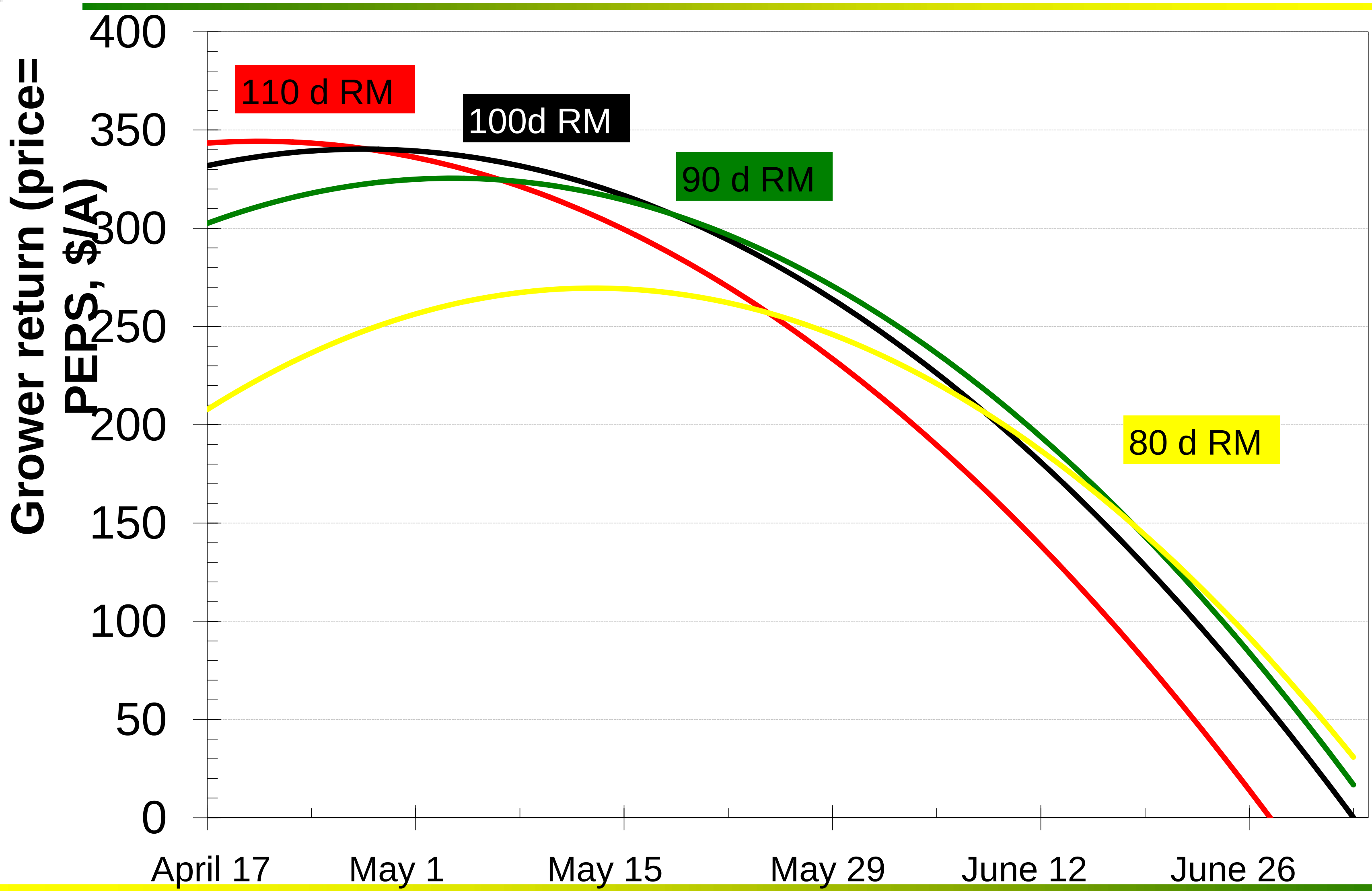


Analyzed a total of 35 locations (n= 16,139 plots)

Relationship between grain yield and planting date for corn RM group at Arlington, WI (1974 to 2001)



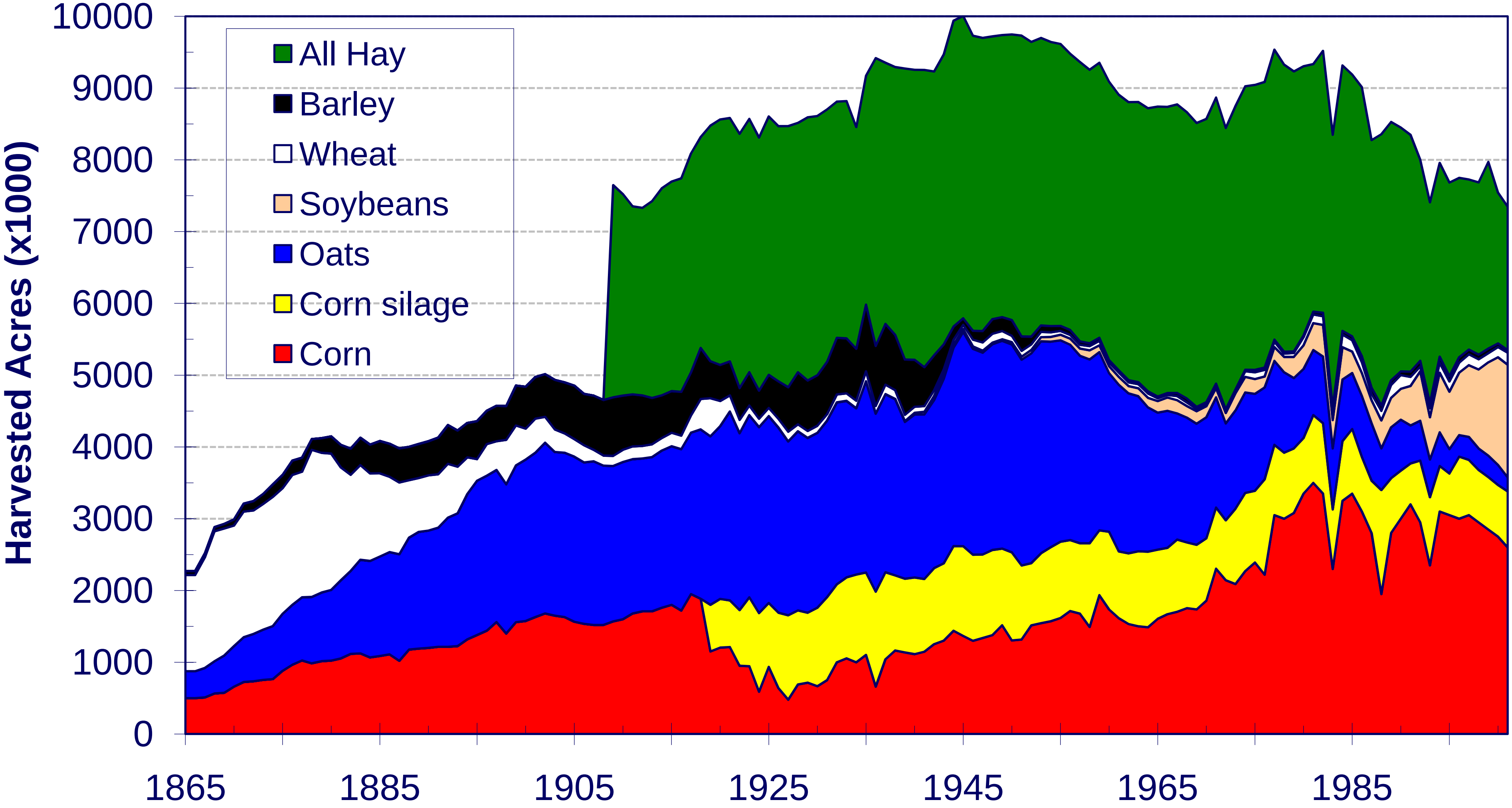
Relationship between grower return (price = PEPS) and planting date for corn RM group at Arlington, WI (1974 to 2001)



Switch Dates for Corn Hybrids in Wisconsin
Full- to Shorter-Season Maturity

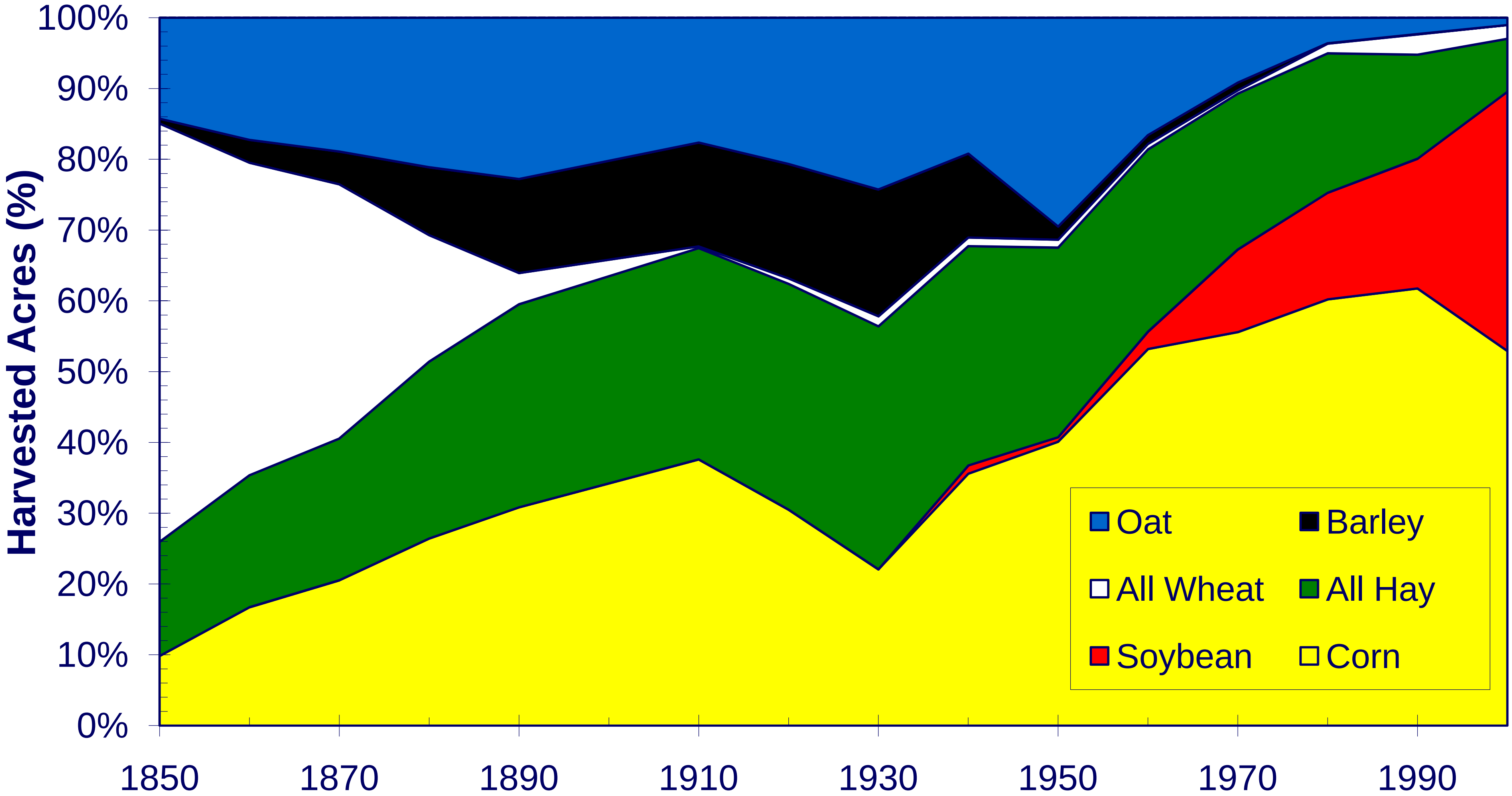
Corn System	Drying Cost	Corn Price $2.00	Corn Price $2.50	Corn Price $3.00
Commercial	$0.04	May 8	May 9	May 11
On-Farm	$0.02	May 14	May 15	May 17
Livestock	$0.00	May 20	May 21	May 22

Harvested Acreage of Crops in Wisconsin



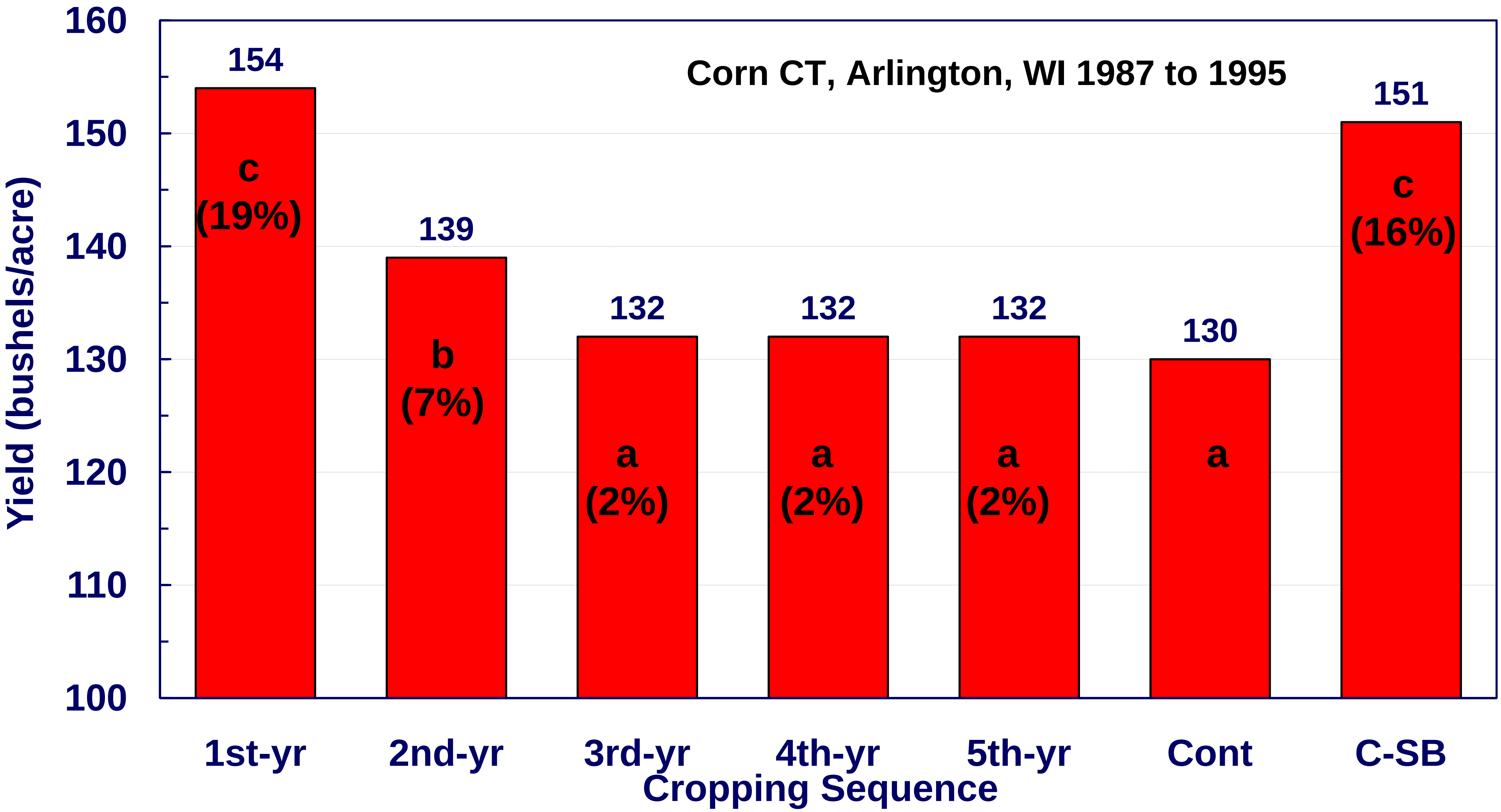
Source: USDA Statistical

Harvested Acres for Rock County, Wisconsin

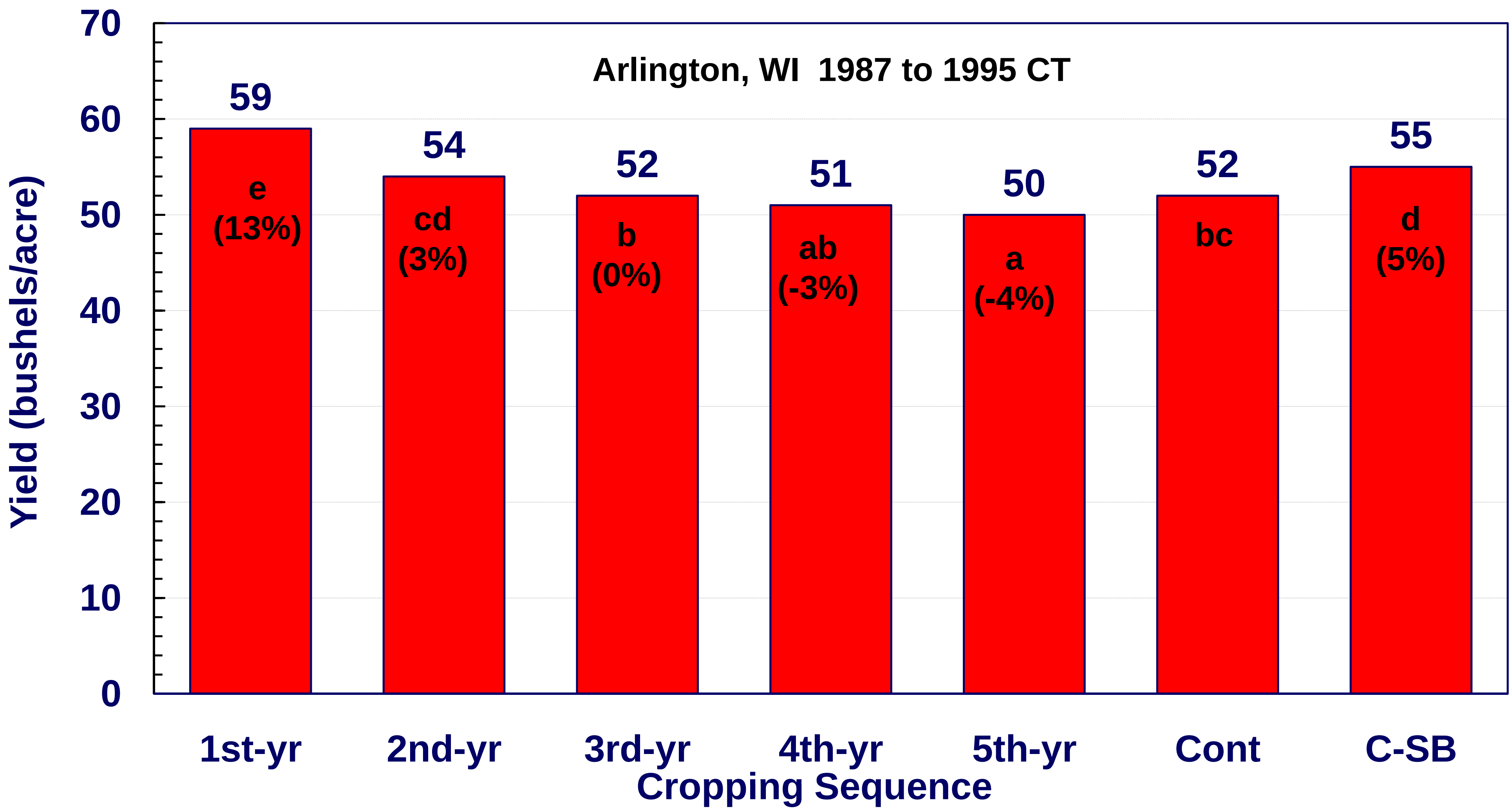


Source: WI DATCP and USDA Statistical

Corn Yield Response Following Five Years of Soybean in a Corn-Soybean Rotation



Soybean Yield Response Following Five Years of Corn in a Corn/Soybean Rotation



Risk in corn-soybean rotations at Arlington, WI (1987-2001)

	Grain Yield				Grower return			
	Corn		Soybean		Corn= $2.50		Soybean= $4.50	
	Yield	Risk	Yield	Risk	Return	Risk	Return	Risk
	bu/A	±bu/A	bu/A	±bu/A	$/A	±$/A	$/A	±$/A
1st-yr	172	10	60	8	358	14	252	13
2nd-yr	157	10	57	8	327	15	238	13
3rd-yr	147	10	54	8	306	15	228	13
4th-yr	141	11	53	8	296	15	223	13
5th-yr	141	11	53	8	295	15	222	13

How are high yields achieved with continuous crop systems?

Summary

- Optimum plant density is 30,000 plants/A (± 4000-5000 plants/A)
  - ✓ Risk at 45,000 plants/A is 3 to 10x greater than at optimum
  - ✓ Trend is for increasing plant density
- One planting date switch in the north and maybe two dates in southern Wisconsin.
  - ✓ First date around May 15-20 and second date around June 1.
  - ✓ Final planting dates for grain are June 1 and June 10 in north and south. After these dates production system objectives change.
  - ✓ Equal risk at all planting dates
- Yield decreases as crop is continuously grown. Equal risk is observed at all years in continuous v. rotated crops.

Looking Ahead to 2003

- Concerned for soil moisture
- Performance of corn rootworm resistant hybrids
- Ethanol plants should result in lower basis and greater demand for corn grain. Shift in grain movement.
- Organic standards and implications for corn production in Wisconsin.
- Monitoring development of pest resistance in transgenic corn.