



Economics of GMO Technologies

Joe Lauer

University of Wisconsin



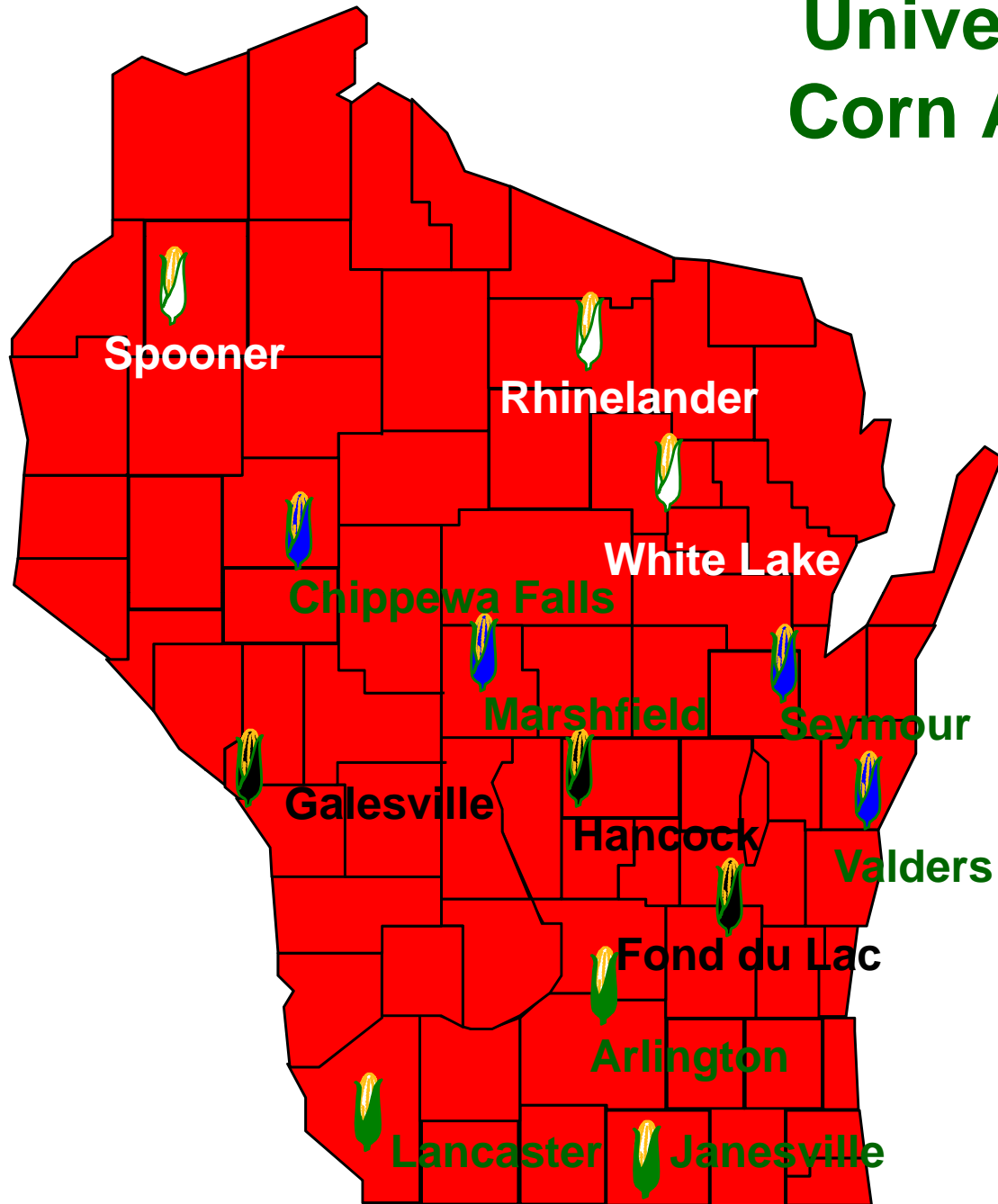
Overview

- Describe data set used and calculations
- Ranking of transgenic hybrids to the trial average
- Yield and grower return of transgenic corn hybrids compared to the:
 - ✓ Trial average
 - ✓ Normal dent corn hybrid average
 - ✓ Sister lines
- Economics matrix



<http://corn.agronomy.wisc.edu/select/>

University of Wisconsin Corn Agronomy Program 2002





Calculating Grower Return

Grower return = (Yield x Price)

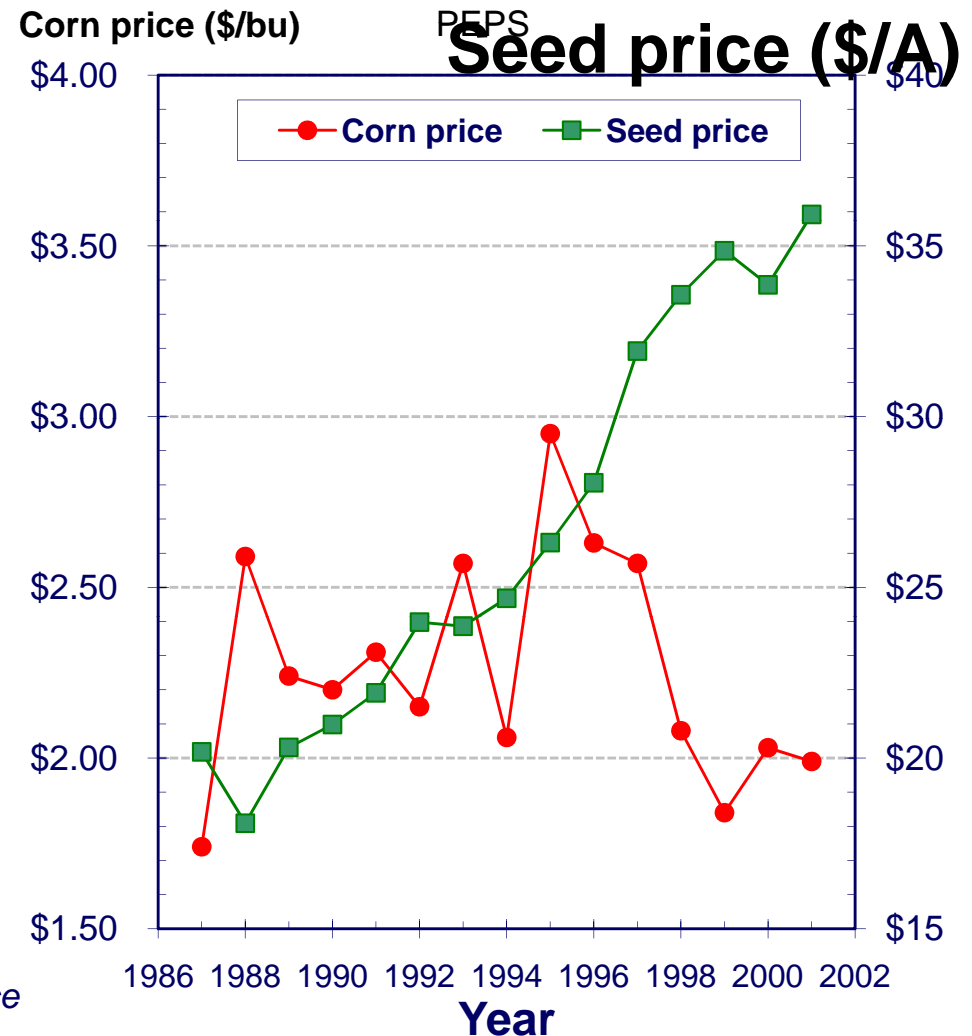
- Handling (\$0.02 per bushel)
 - Hauling (\$0.04 per bushel)
 - Trucking (\$0.11 per bushel)
 - Drying (\$0.02 per bushel-point above 15.5%)
 - Storage (\$0.02 per 30 day)
 - Seed (\$10 per Acre) for *Transgenic corn*
- Marketing plan: 50% sold at harvest, 25% at 4 months, and 25% at 8 months.

gr250: Price per bushel = \$2.50

- Livestock: \$0.00 drying, \$0.01 storage, \$0.00 trucking
- On-farm: \$0.02 drying, \$0.02 storage
- Commercial: \$0.04 drying, \$0.03 storage

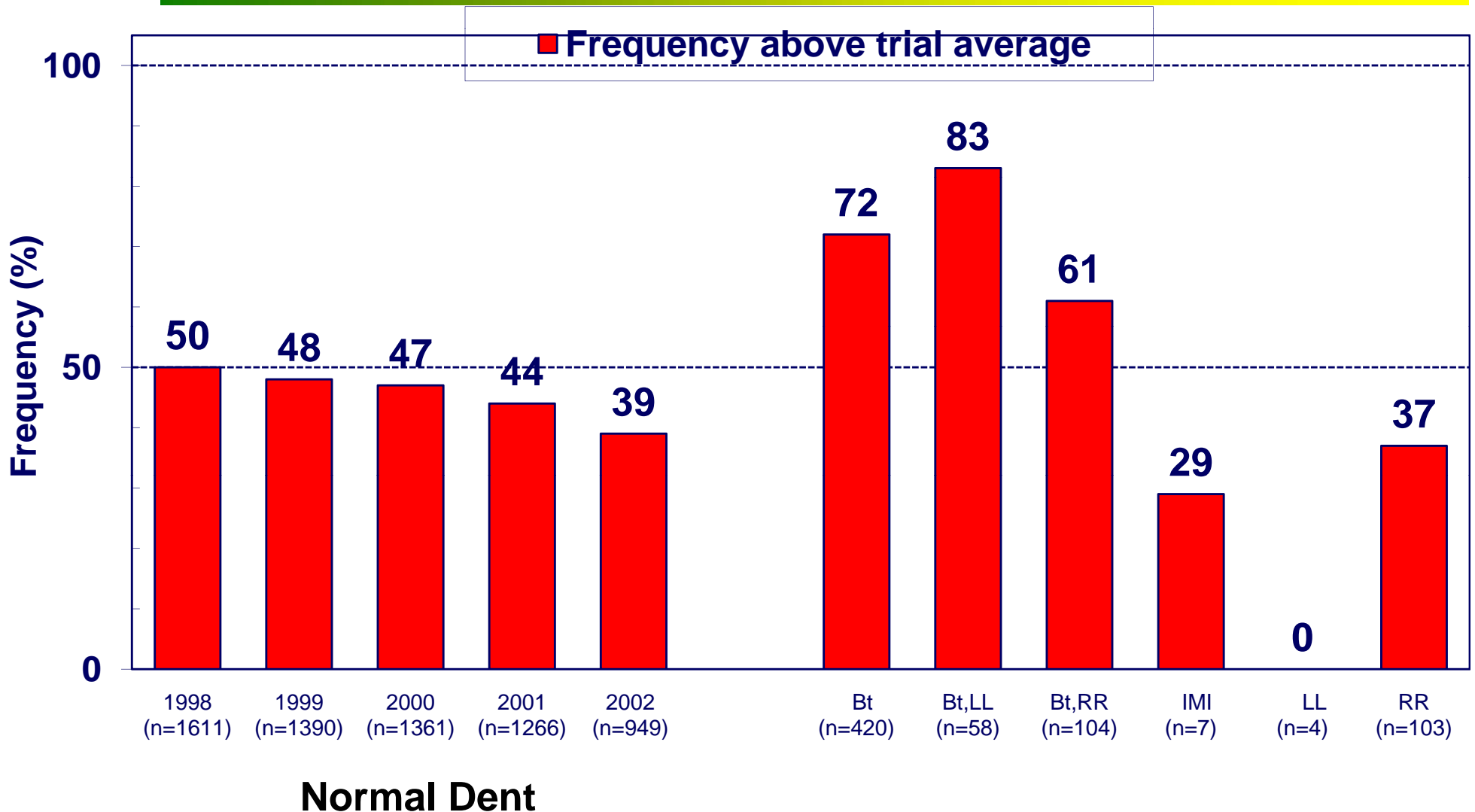
grPEPS: Weighted Price per bushel

- = 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.



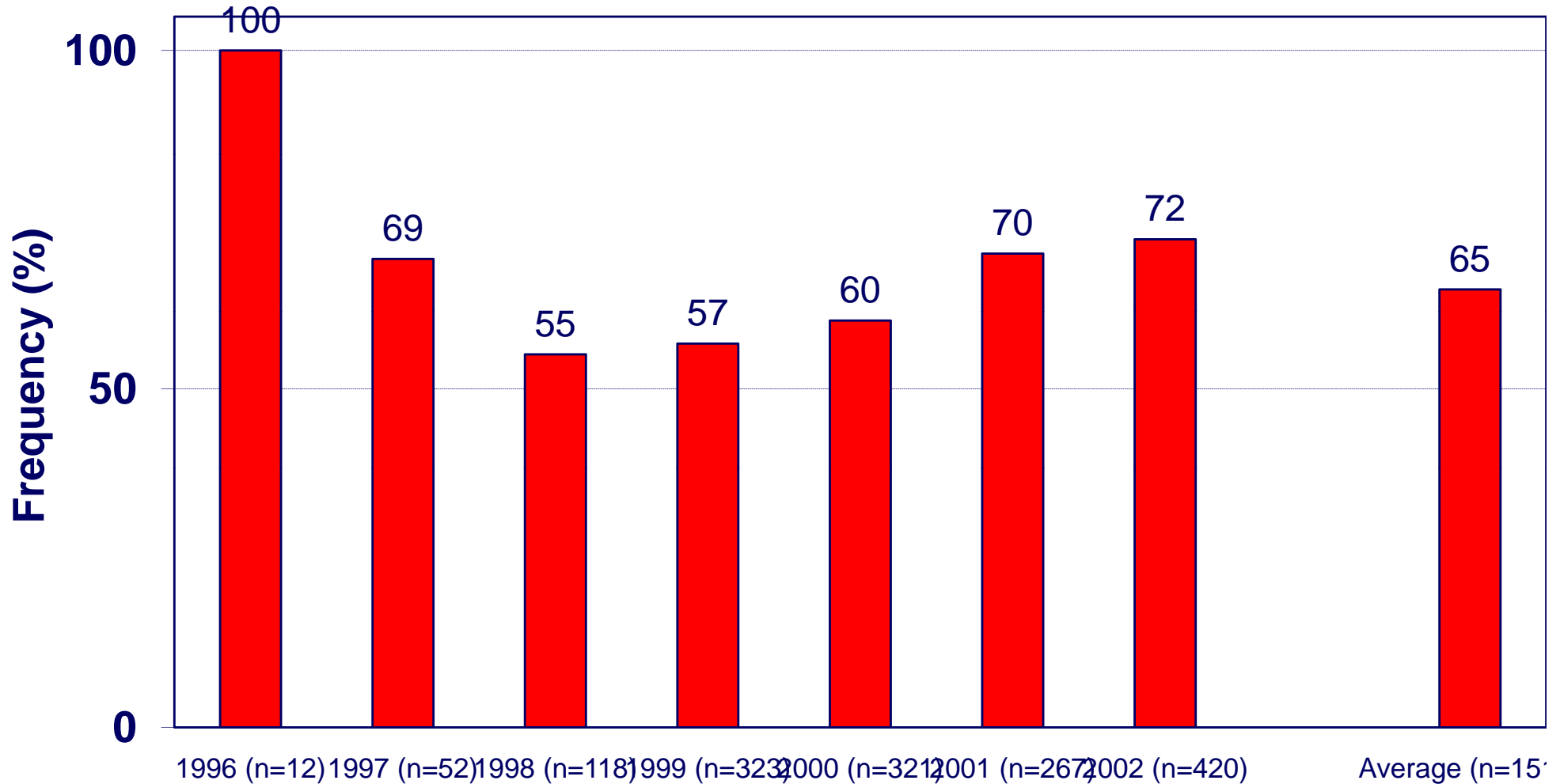


Frequency of Specialty Hybrids Yielding Above Average in the 2002 WI Hybrid Trials



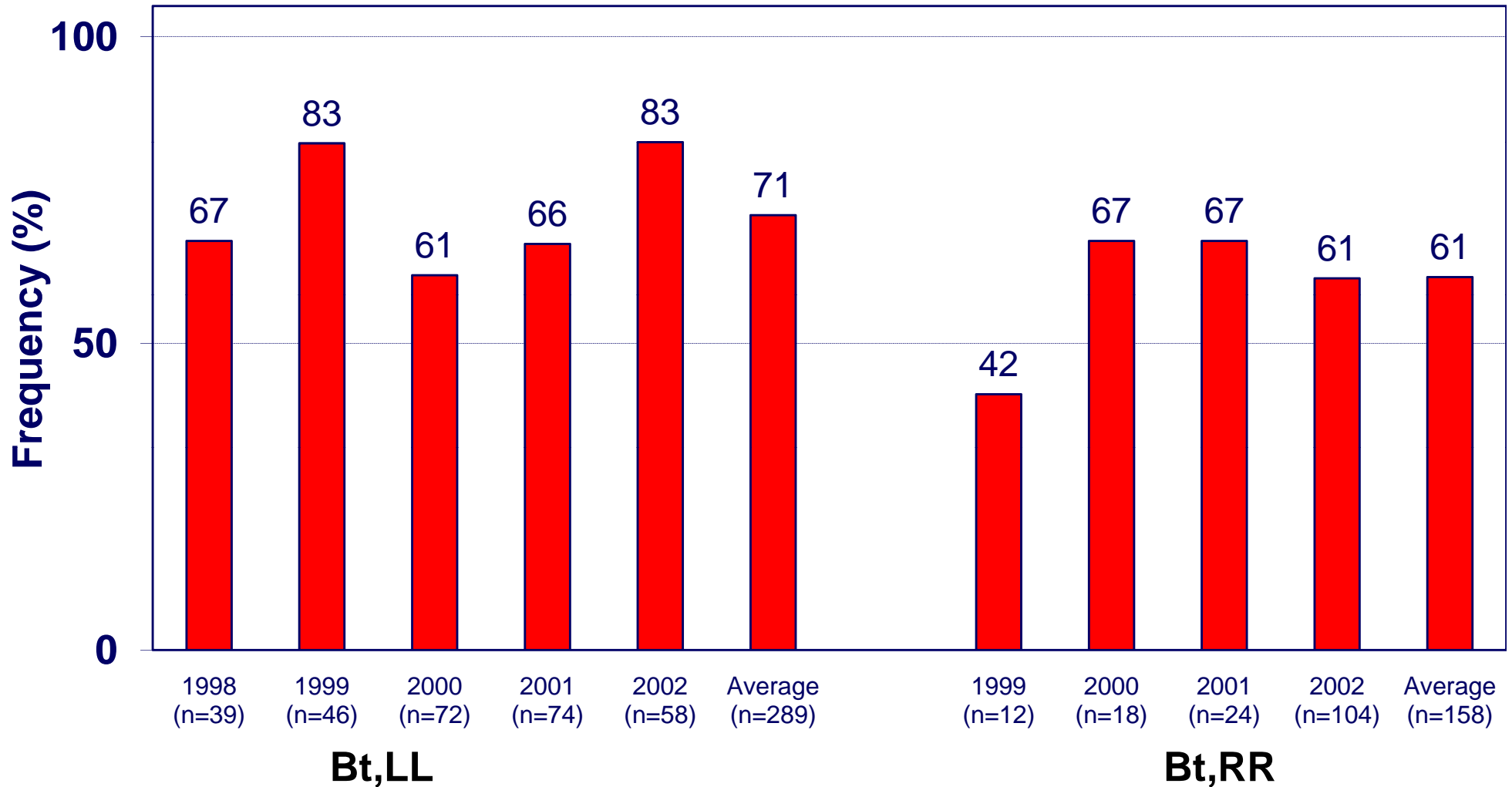


Frequency of “Bt” Hybrids yielding Above the Trial Average in the WI Corn Trials



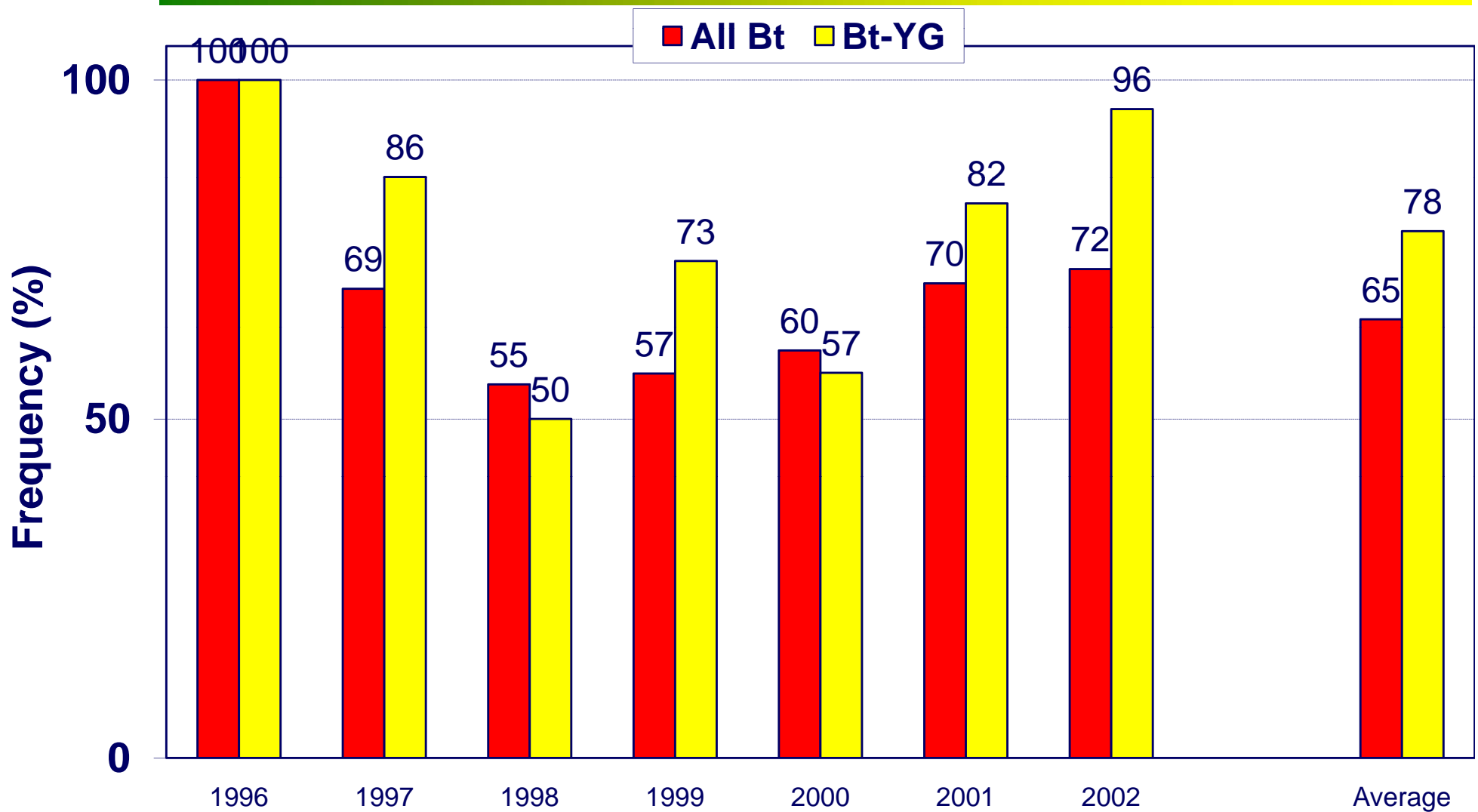


Frequency of “Gene Stack” Hybrids Yielding Above the Trial Average in the WI Corn Trials



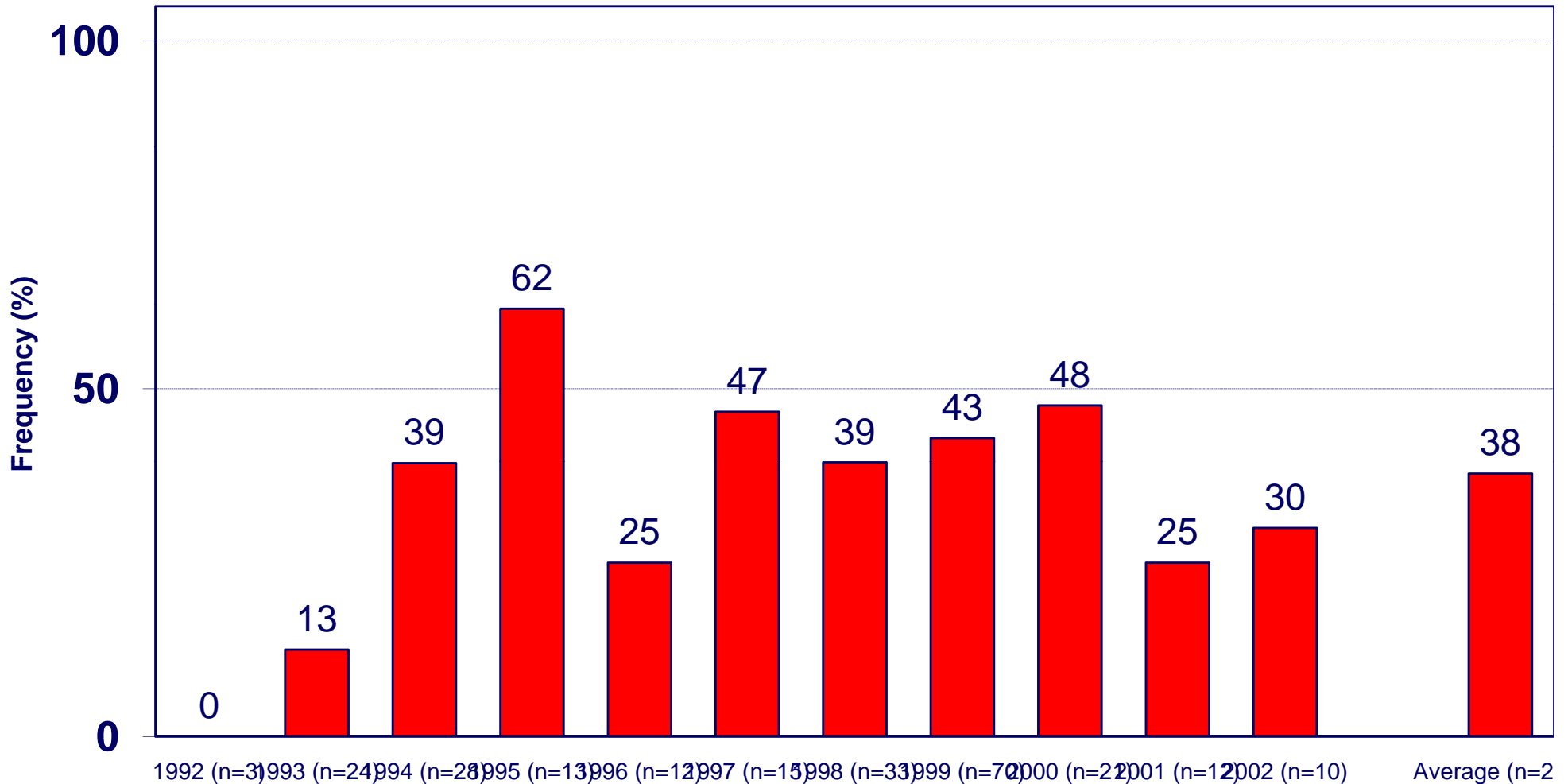


Frequency of “Bt” Hybrid Events yielding Above the Trial Average in the WI Corn Trials



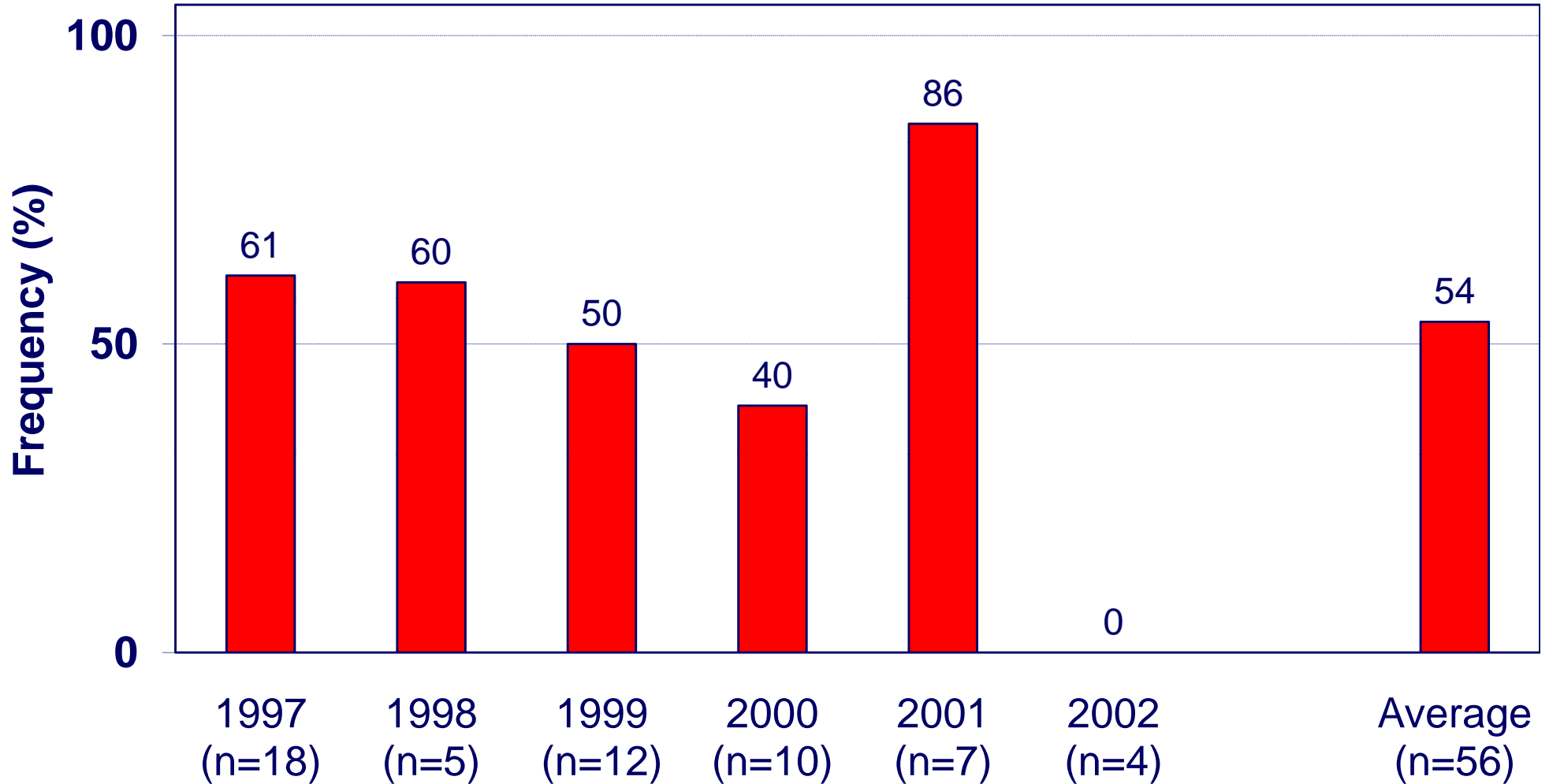


Frequency of “IMI” Hybrids (IT and IR) Yielding Above the Trial Average in the WI Corn Trials



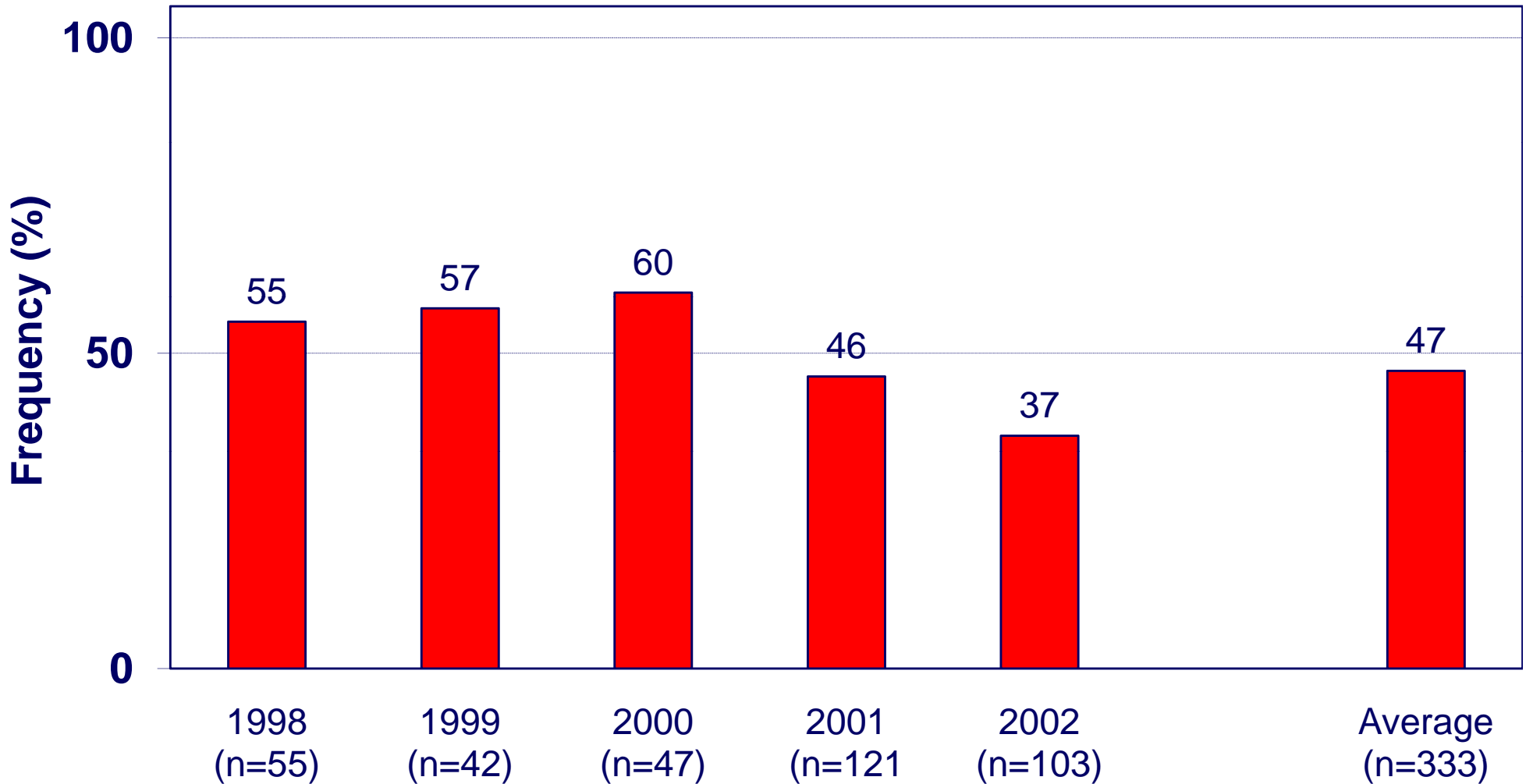


Frequency of “Liberty Link” Hybrids Yielding Above the Trial Average in the WI Corn Trials





Frequency of “Roundup Ready” Hybrids Yielding Above the Trial Average in the WI Corn Trials





Relative Performance of Specialty Hybrids Compared to the Trial Average (through 2002)

Specialty Trait	N	Grain yield Bu/A	Grain moisture %	Lodging %	GR \$2.50 \$/A	GR PEPS \$/A
Bt	1513	6	0.4	0	4.06	1.95
Bt-LL	289	8	0.0	0	9.30	5.77
Bt-RR	158	6	0.3	0	4.45	3.05
IMI	241	-4	0.0	0	-15.44	-14.57
LL	56	1	0.9	0	-8.23	-8.57
RR	333	-2	0.3	0	-2.19	-9.71

Grower return = (Yield x Corn price) – (Drying+Handling+Hauling+Storage+Trucking)

GR PEPS = \$2.24/bu

Drying=\$0.02/point bu, Handling=\$0.02/bu; Hauling=\$0.04/bu; Storage=\$0.02/bu mo; Trucking \$0.11/bu



Relative Performance of Specialty Hybrids Compared to the Average of Normal Corn (through 2002)

Specialty Trait	N	Grain yield Bu/A	Grain moisture %	Lodging %	GR \$2.50 \$/A	GR PEPS \$/A
Bt	1513	8	0.5	0	4.82	2.03
Bt-LL	289	10	0.1	0	9.57	9.81
Bt-RR	158	9	0.4	-1	8.16	5.68
IMI	241	-3	0.1	0	-16.52	-15.86
LL	56	2	1.0	0	-9.64	-10.23
RR	333	0	-0.1	0	-9.09	-9.17

Grower return = (Yield x Corn price) – (Drying+Handling+Hauling+Storage+Trucking)

GR PEPS = \$2.24/bu

Drying=\$0.02/point bu, Handling=\$0.02/bu; Hauling=\$0.04/bu; Storage=\$0.02/bu mo; Trucking \$0.11/bu



Relative Performance of Specialty Hybrids Compared to Normal Sister Lines (through 2002)

Specialty Trait	N	Grain yield Bu/A	Grain moisture %	Lodging %	GR \$2.50 \$/A	GR PEPS \$/A
Bt	124	4	1.0	0	-5.09	-6.42
Bt-LL	7	15	0.0	-3	22.13	13.79
IMI	9	-17	0.6	0	-44.84	-42.18
RR	28	-2	0.1	-1	-13.37	-12.36

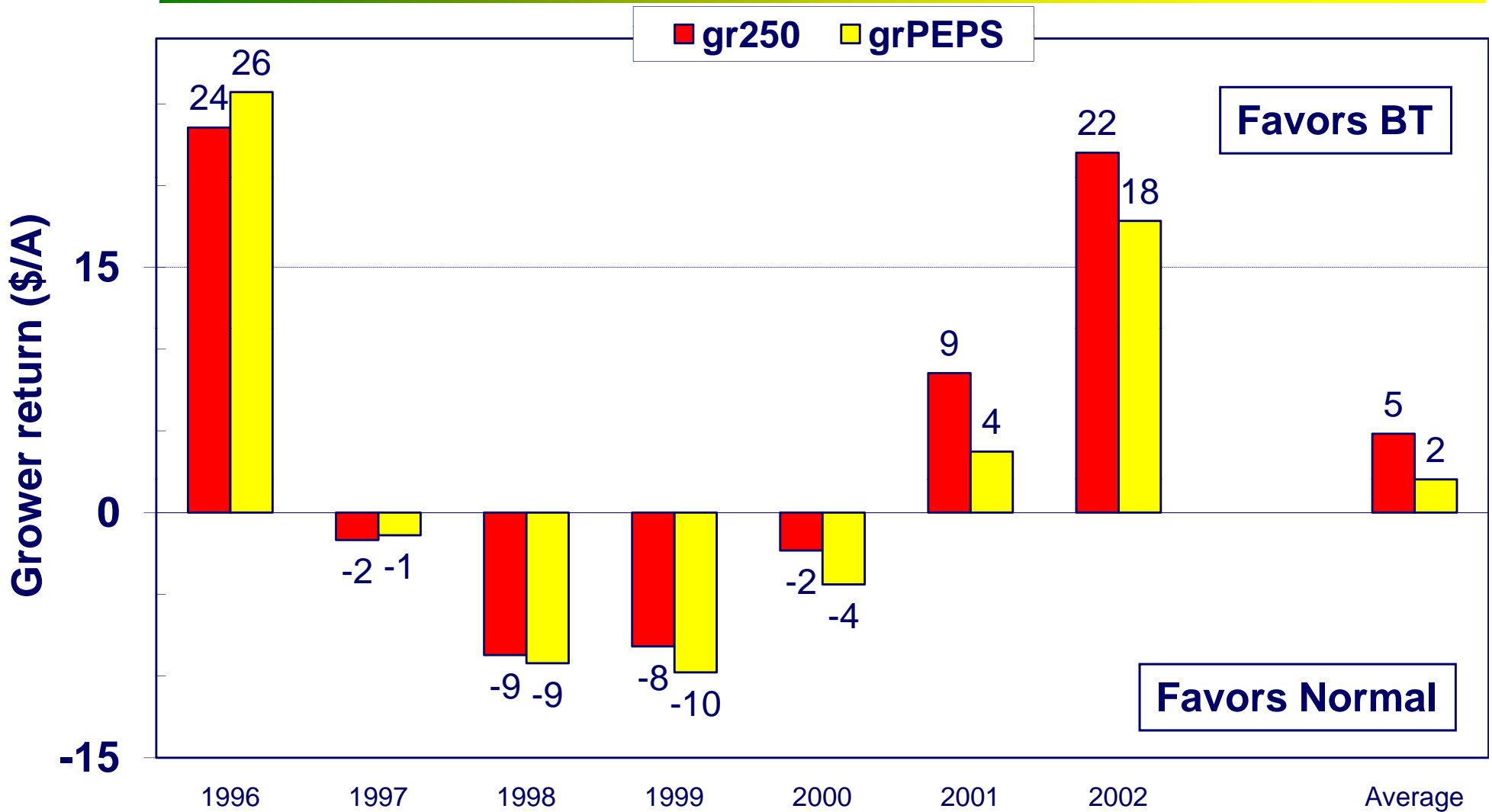
Grower return = (Yield x Corn price) – (Drying+Handling+Hauling+Storage+Trucking)

GR PEPS = \$2.24/bu

Drying=\$0.02/point bu, Handling=\$0.02/bu; Hauling=\$0.04/bu; Storage=\$0.02/bu mo; Trucking \$0.11/bu



Grower return of “Bt” Hybrids Compared to Normal Dent Corn Hybrids in the WI Corn Trials





Breakeven Matrix for Corn Hybrid Seed Sold at Various Technology Fees

Yield increase (Bu/A)	Technology fee= \$10 / bag			Technology fee= \$20 / bag			Technology fee= \$30 / bag		
	Corn price (\$/Bu)			Corn price (\$/Bu)			Corn price (\$/Bu)		
	2.00	2.50	3.00	2.00	2.50	3.00	2.00	2.50	3.00
0	-4.13	-4.13	-4.13	-8.25	-8.25	-8.25	-12.38	-12.38	-12.38
2	-0.13	0.87	1.87	-4.25	-3.25	-2.25	-8.38	-7.38	-6.38
4	3.87	5.87	7.87	-0.25	1.75	3.75	-4.38	-2.38	-0.38
6	7.87	10.87	13.87	3.75	6.75	9.75	-0.38	2.63	5.62
8	11.87	15.87	19.87	7.75	11.75	15.75	3.62	7.62	11.62
10	15.87	20.87	25.87	11.75	16.75	21.75	7.62	12.62	17.62

Assume: 80,000 seeds/bag planted at 33,000 seeds/A for final population of 30,000 plants/A



Summary

- Bt, Bt-LL and Bt-RR corn hybrids yield and return more than the trial and normal dent corn average.
 - ✓ At this time IMI, SR, LL, RR, Bt-IMI traits do not add to yield or grower return.
- IMI, SR, LL, RR, and Bt-IMI corn hybrids should only be recommended for problem fields or difficult management situations.
- ***“Variation for grain yield exists among commercial Transgenic hybrids sold in Wisconsin.”***
 - ✓ Care must be taken in selecting individual hybrids.