Performance of Corn Silage Hybrid Types

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Overview

- What do we want in corn silage hybrids?
- What are the available corn hybrid types?
- How have these types performed?
- How should you approach hybrid selection decisions?

Yield and Digestibility of Corn Plant Parts

Tissue	Percent Yield	Digestibility (%)
Leaf blades	11	73
Leaf sheaths	4	63
Stalk+tassel	19	60
Cob+husk+shank	22	72
Kernels	44	94
Whole plant	100	71

Adapted from Deinum and Struik, 1989

Desirable Forage Characteristics

- What makes a good forage? (Carter et al., 1991)
  - ✓ High yield
  - ✓ High energy (high digestibility)
  - ✓ High intake potential (low fiber)
  - ✓ High protein
  - ✓ Proper moisture at harvest for storage
- Ultimate test is animal performance
  - ✓ Milk2000 is our best predictor for performance (Schwab - Shaver equation)

What Do We Want in Grain versus Forage Hybrids?

Trait	Grain	Forage
Grain yield	High	Adequate
Forage yield	Adequate	High
Hybrid range	60 bu/A	8,000 lb Milk/A
Stalks	Standability	Digestibility
Leaves	Unknown	Digestibility
Kernel hardness	Hard	Soft
Plant drydown	“Stay-green”	Synchronous
Plant maturity	“Full-season”	5-10 d longer

Corn Hybrid Types

- Normal
- Bmr
- Leafy
- High protein
- High oil
- Waxy
- Transgenic
  - ✓ Bt
  - ✓ RR
  - ✓ Bt,LL
  - ✓ Bt,RR

- Dwarf corn
- “Sugar” corn
- Profusely-tillering
- Autotetraploid
- Teosinte
- Sweet corn
- Pop corn

Questionable value due to lower yield and poorer agronomics.

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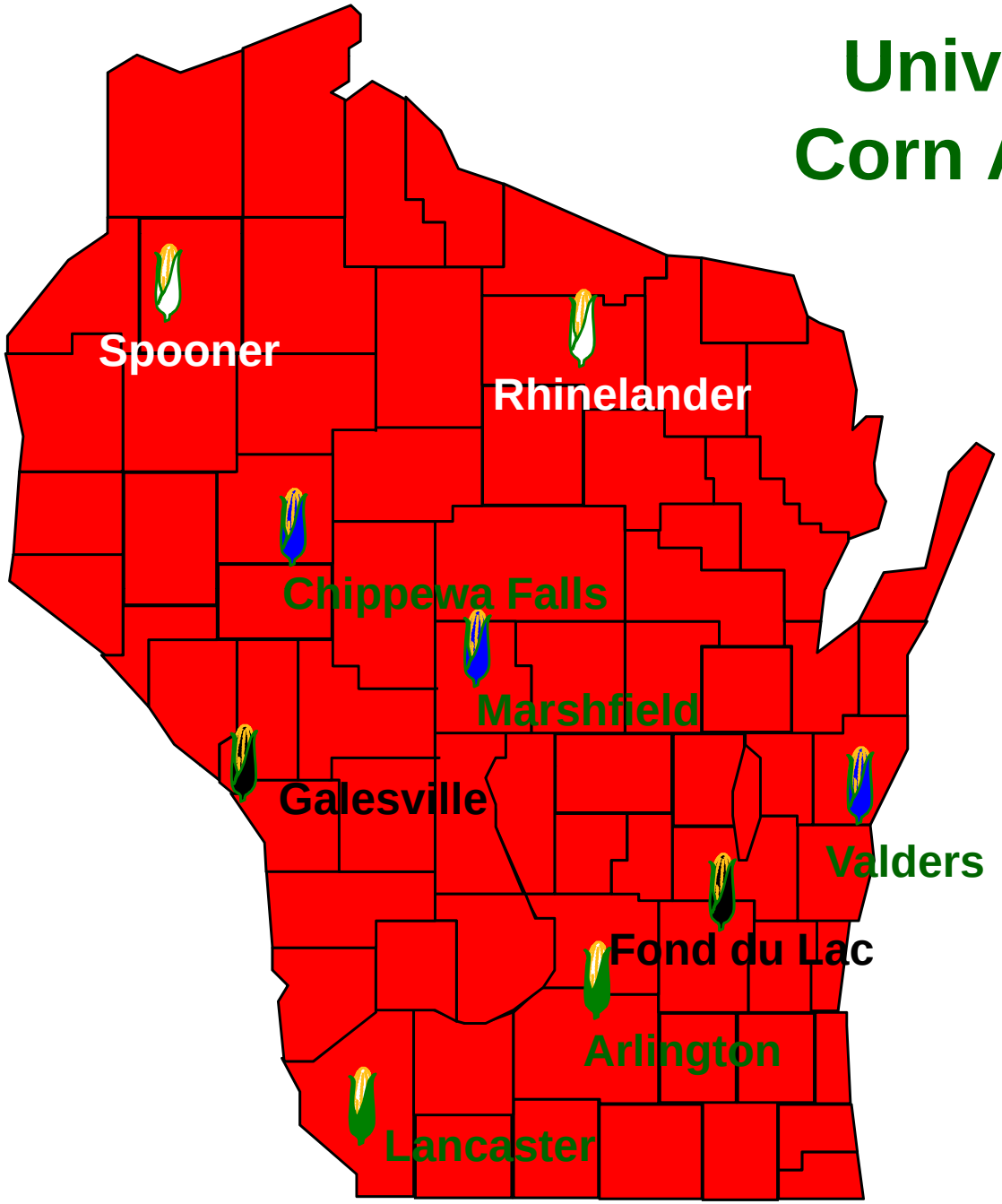
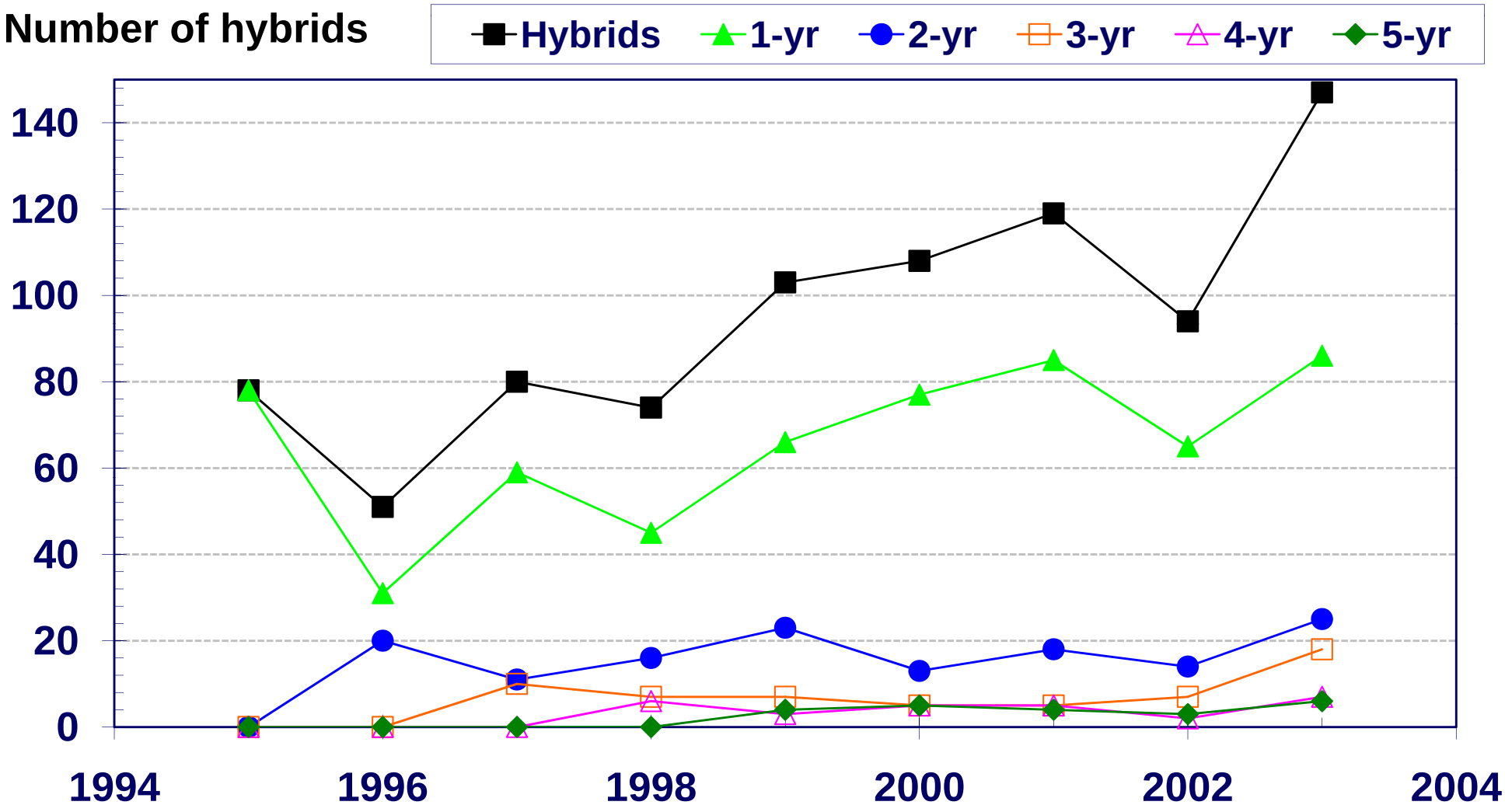


Number of hybrids tested in the UW Corn Silage Performance Trials



2002 Wisconsin Corn Hybrid Performance Trial Results

Table 13. South Central Zone - Early Maturity Silage Trial.

100 DAY RELATIVE MATURITY OR EARLIER, BASED ON COMPANY RATING (FOND DU LAC = FON, GALESVILLE = GAL)

		2002 AVERAGE													2001 AVERAGE					2 Year
						Kernel							FON	GAL				FON	GAL	Average
		Yield	MILK PER		Moist	Milk	CP	ADF	NDF	IVD	NDFD	Starch	Yield	Yield	Yield	MILK PER		Yield	Yield	Yield
BRAND	HYBRID	T/A	TON	ACRE	%	%	%	%	%	%	%	%	T/A	T/A	T/A	TON	ACRE	T/A	T/A	T/A
Dekalb	DKC4446	8.8	3380	30000	48.1	20	6.6	25	49	82	63	37	7.5	10.2 *						
Golden Harvest	H2387	8.9	3440	30900 *	54.7	20	7.5	23	46	82	62	37	7.3	10.5 *						
Dairyland	HiDF3300	8.9	3440	30800 *	55.7	20	7.2	24	46	83	62	37	8.0	9.8 *						
Golden Harvest	H6775Bt	8.8	3350	29800	57.0	20	7.2	25	47	81	60	35	7.5	10.1 *						
100-DAY HYBRID TRIAL AVERAGE##					58.7															
Growmark	FS4042Bt	9.7 *	3400	33100 *	58.9	30	7.0	25	47	82	61	37	9.3 *	10.2 *						
La Crosse Forage	LC7415	8.8	3380	29900	59.2	40	7.6	25	47	81	60	35	8.3	9.3	8.1	2870 *	23400	7.7	8.5	8.5
Garst	8779	9.2	3430	31600 *	59.3	30	6.9	25	47	82	61	36	8.3	10.0 *	9.0	2770	24900	7.7	10.2	9.1
Battleground	3195	7.8	3370	26500	59.4	30	7.3	25	48	81	61	34	7.1	8.6						
LG Seeds	LG2488	8.6	3320	28700	61.5	30	7.4	26	50	80	60	32	7.8	9.4						
Dekalb	DKC5073	8.7	3340	29000	62.0	40	7.1	25	47	81	59	35	8.5	8.9						
NK Brand	N48V8	10.7 *	3380	36100 *	63.2	40	7.1	28	52	80	62	27	10.2 *	11.1 *	10.6 *	2720	29000 *	9.7 *	11.6 *	10.7 *
Battleground	3203	8.9	3330	29700	63.9	50	7.4	27	50	80	60	32	8.9	8.9						
MEAN		9.0	3380	30500	58.6	30	7.2	25	48	81	61	34	8.2	9.8	8.9	2720	24100	8.0	9.7	9.4
LSD(0.10)**		1.2	NS	5800	5.2	10	0.5	3	5	2	2	5	1.0	1.4	0.7	130	2700	1.0	1.1	0.6

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.

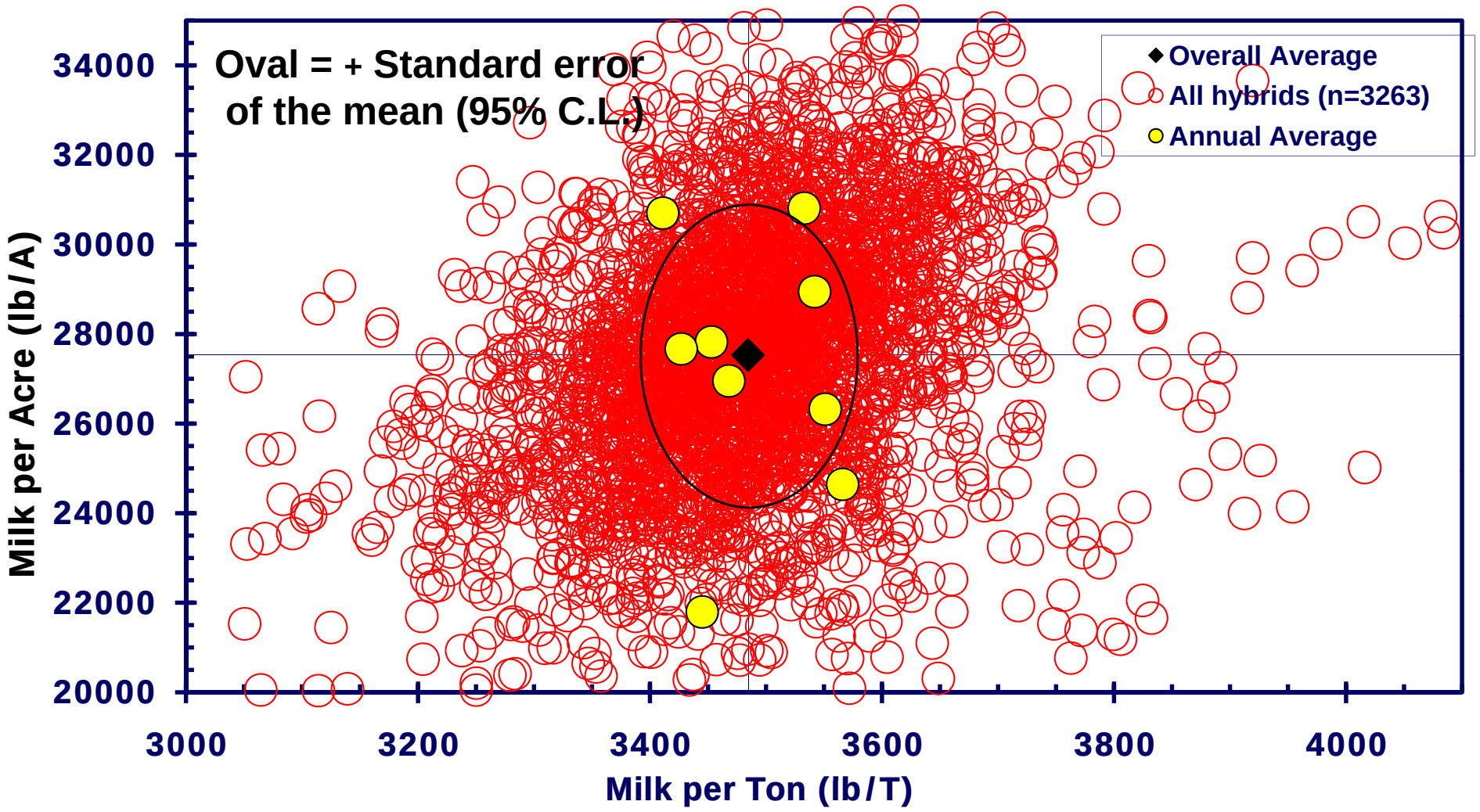
* Hybrids that performed statistically similar to the highest hybrid in the trial.

Shaded results provide the best estimate of relative hybrid performance.

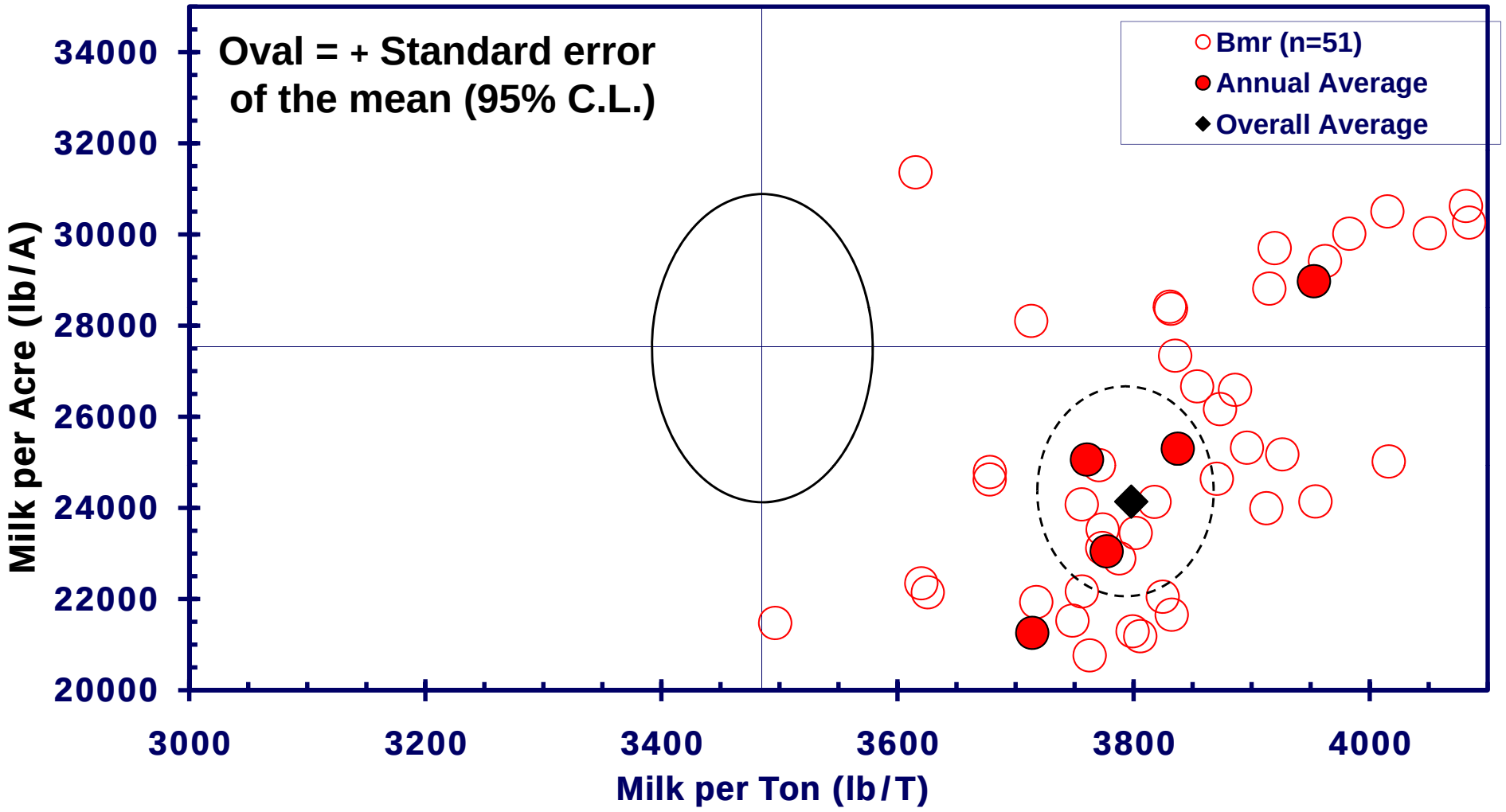
Performance Indices
Milk per Ton and Milk per Acre

- Milk per ton: The amount of milk production from one ton of silage using the quality measures of crude protein, NDF, *invitro* true digestibility, NDFD, and starch content.
  - ✓ Estimate is based on a standard cow body weight of 1350 pounds
  - ✓ Milk production level of 90 pounds milk per day at 3.8 percent fat.
  - ✓ Adjusted for maturity
- Milk per acre = Milk per ton X Dry matter yield per acre

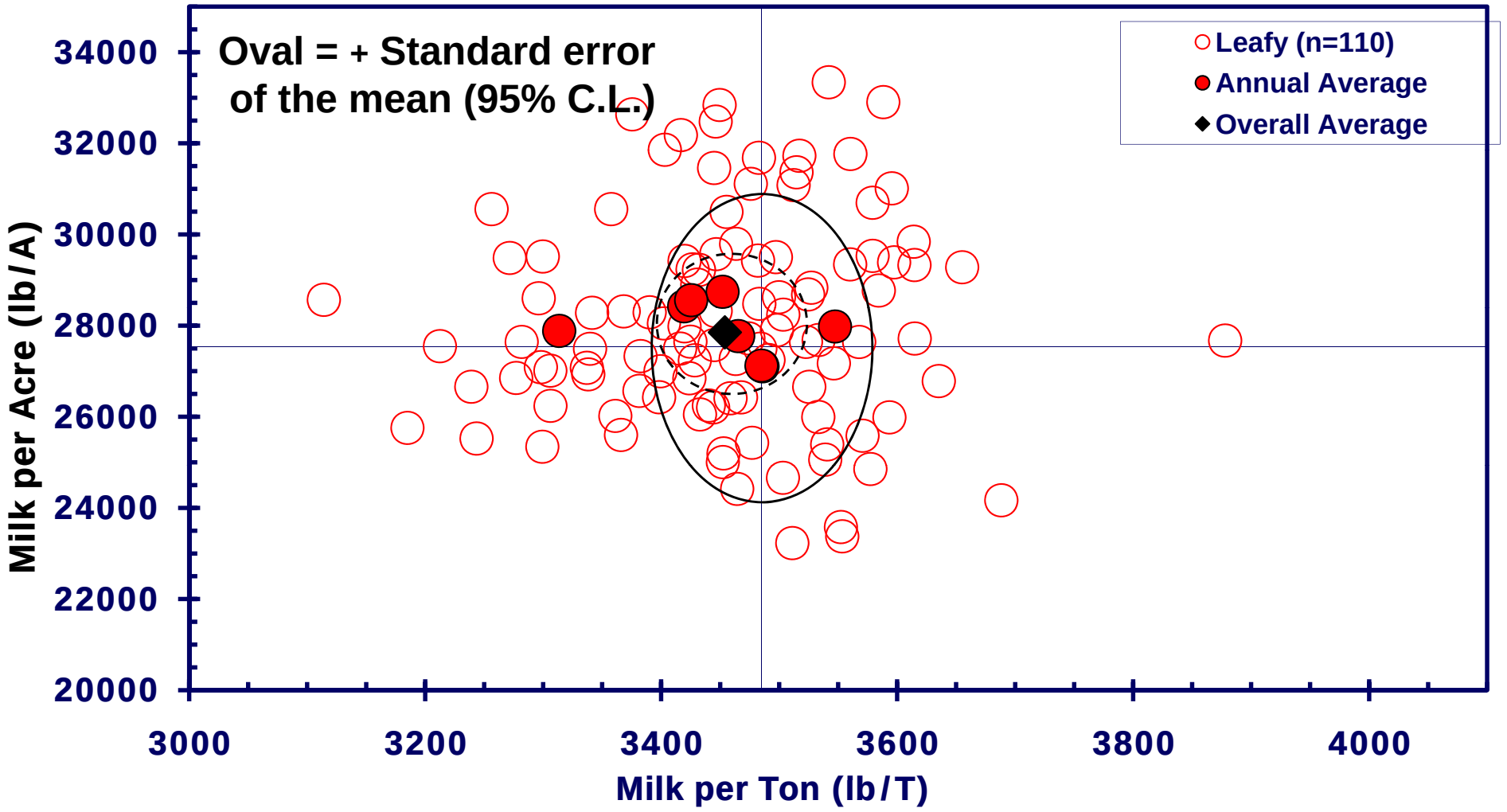
Relative Performance of Corn Hybrids Tested in the UW Silage Trials (1995-2003). Each value is a GxE mean (n= 3263)



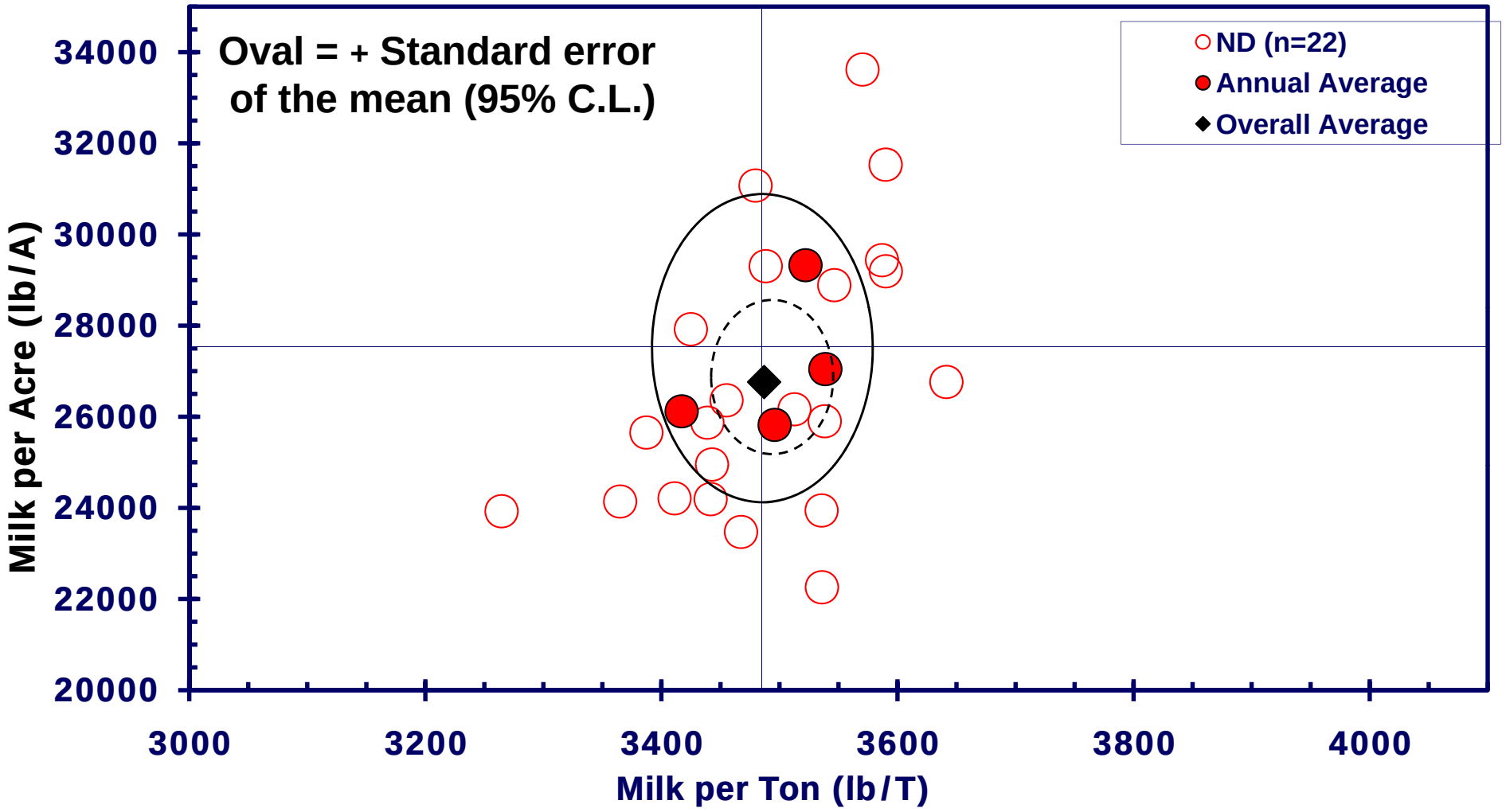
Relative Performance of Corn Bmr Types Tested in the UW Silage Trials (1995-2003).



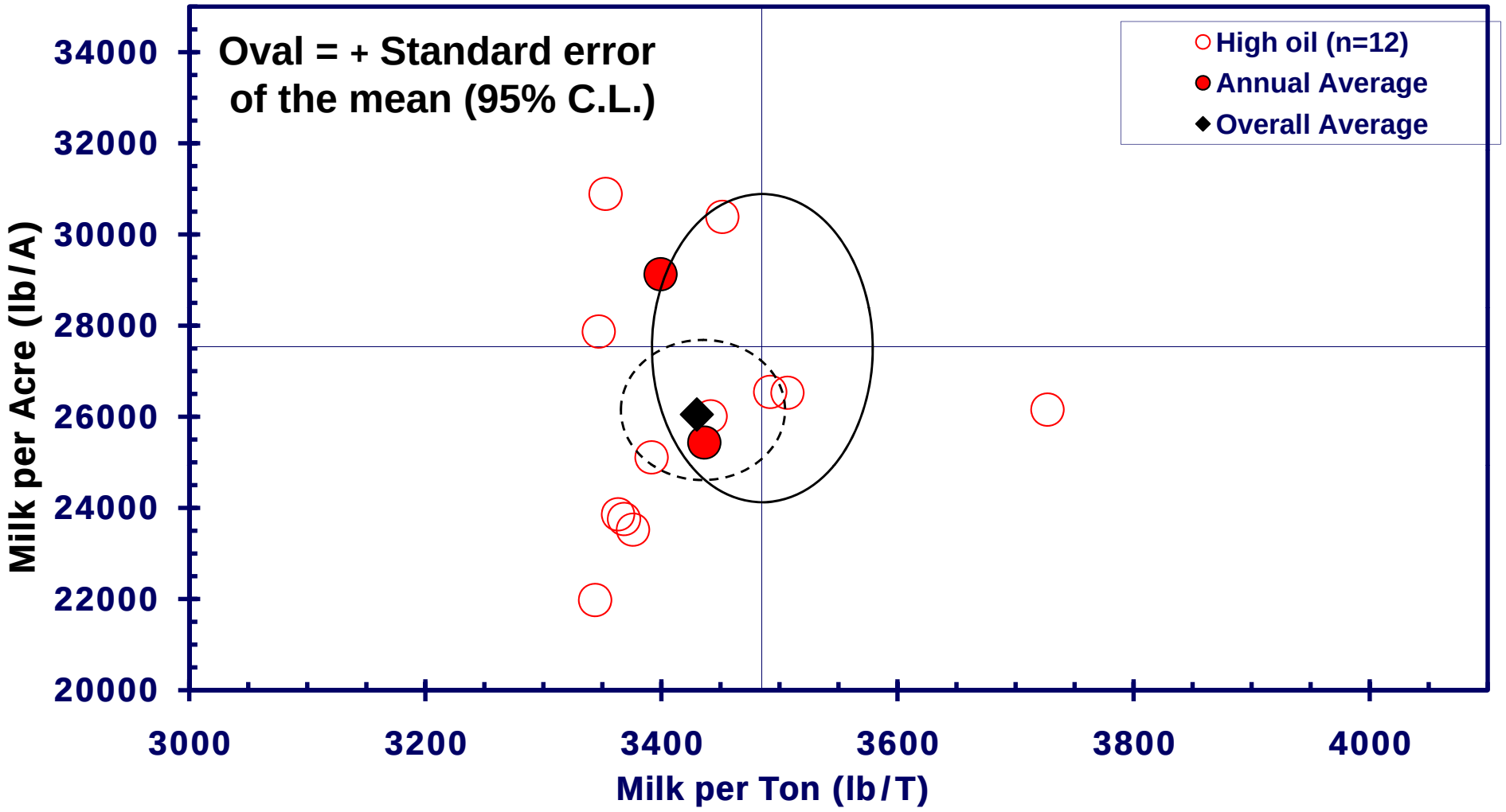
Relative Performance of Corn Leafy Types Tested in the UW Silage Trials (1995-2003).



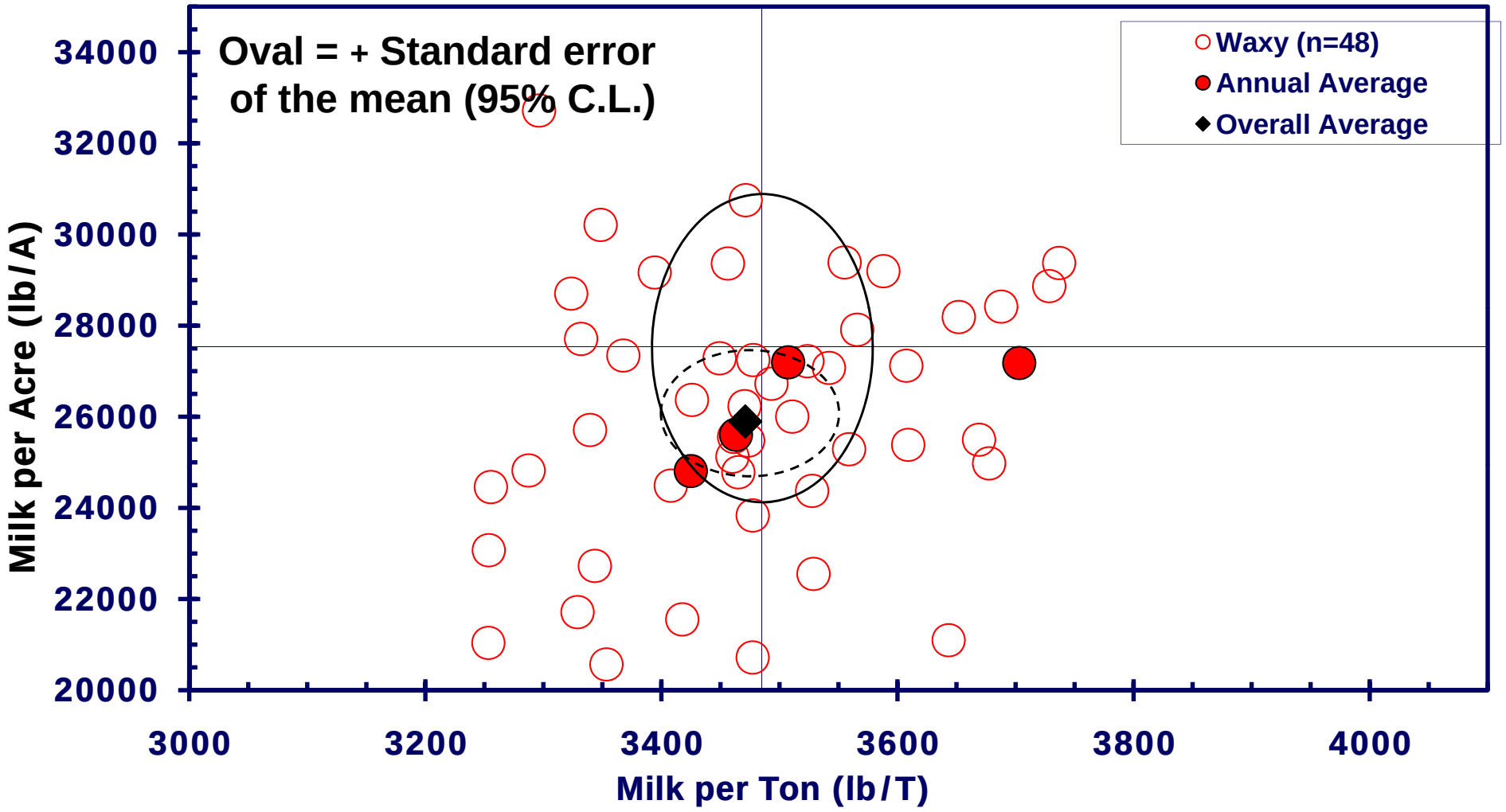
Relative Performance of Corn "Nutri-Dense" Types Tested in the UW Silage Trials (1995-2003).



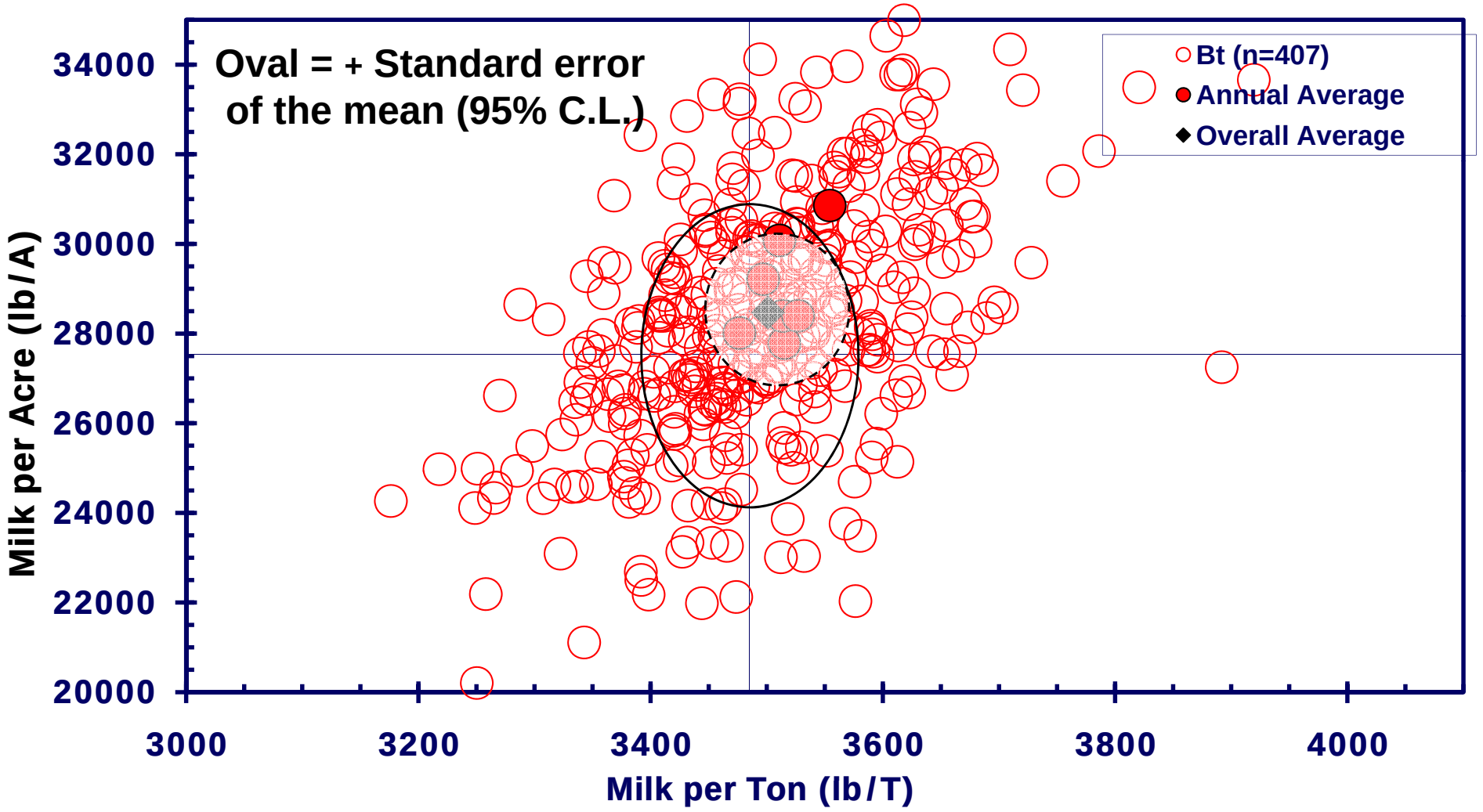
Relative Performance of Corn High Oil Types Tested in the UW Silage Trials (1995-2003).



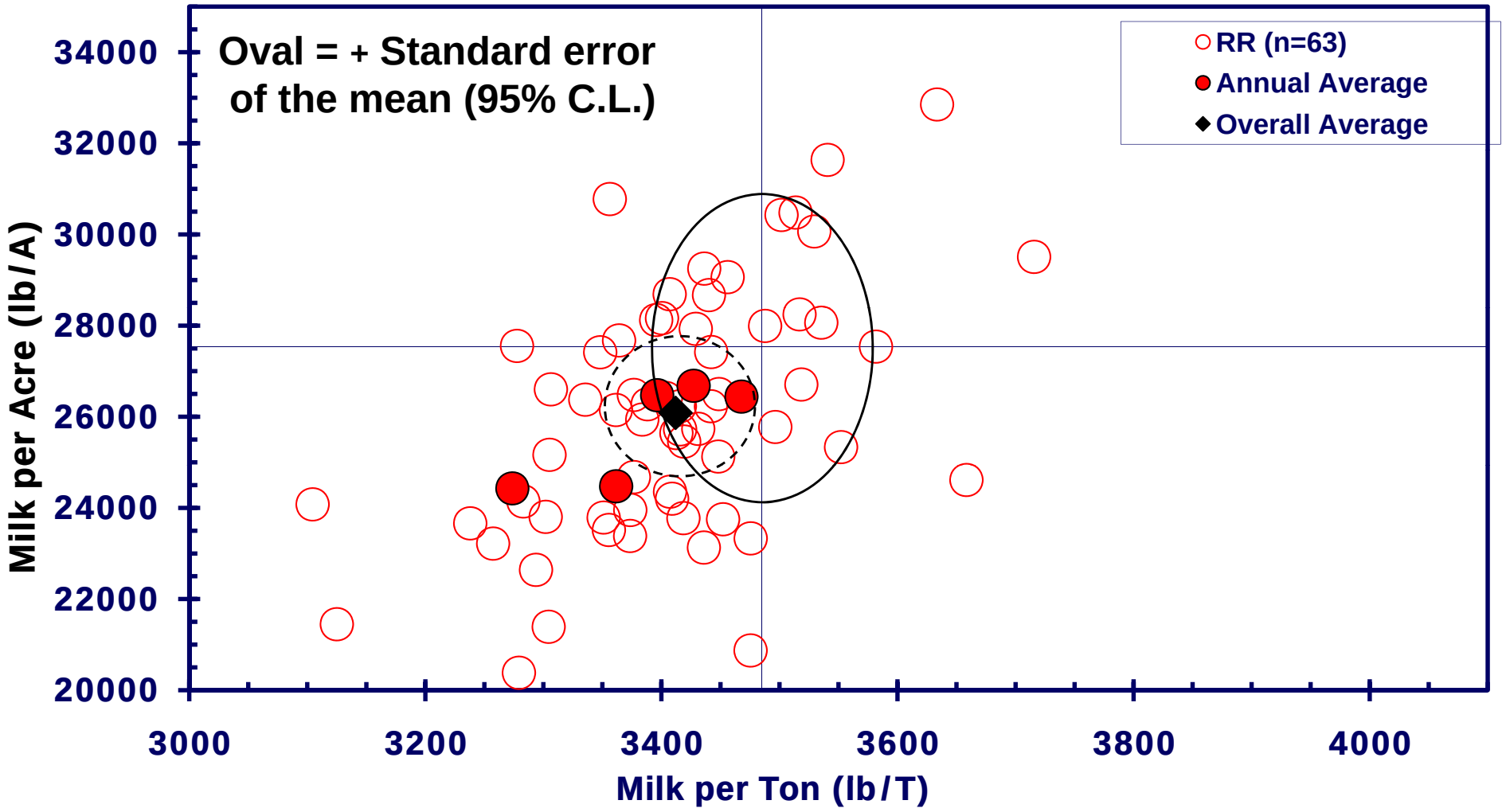
Relative Performance of Corn Waxy Types Tested in the UW Silage Trials (1995-2003).



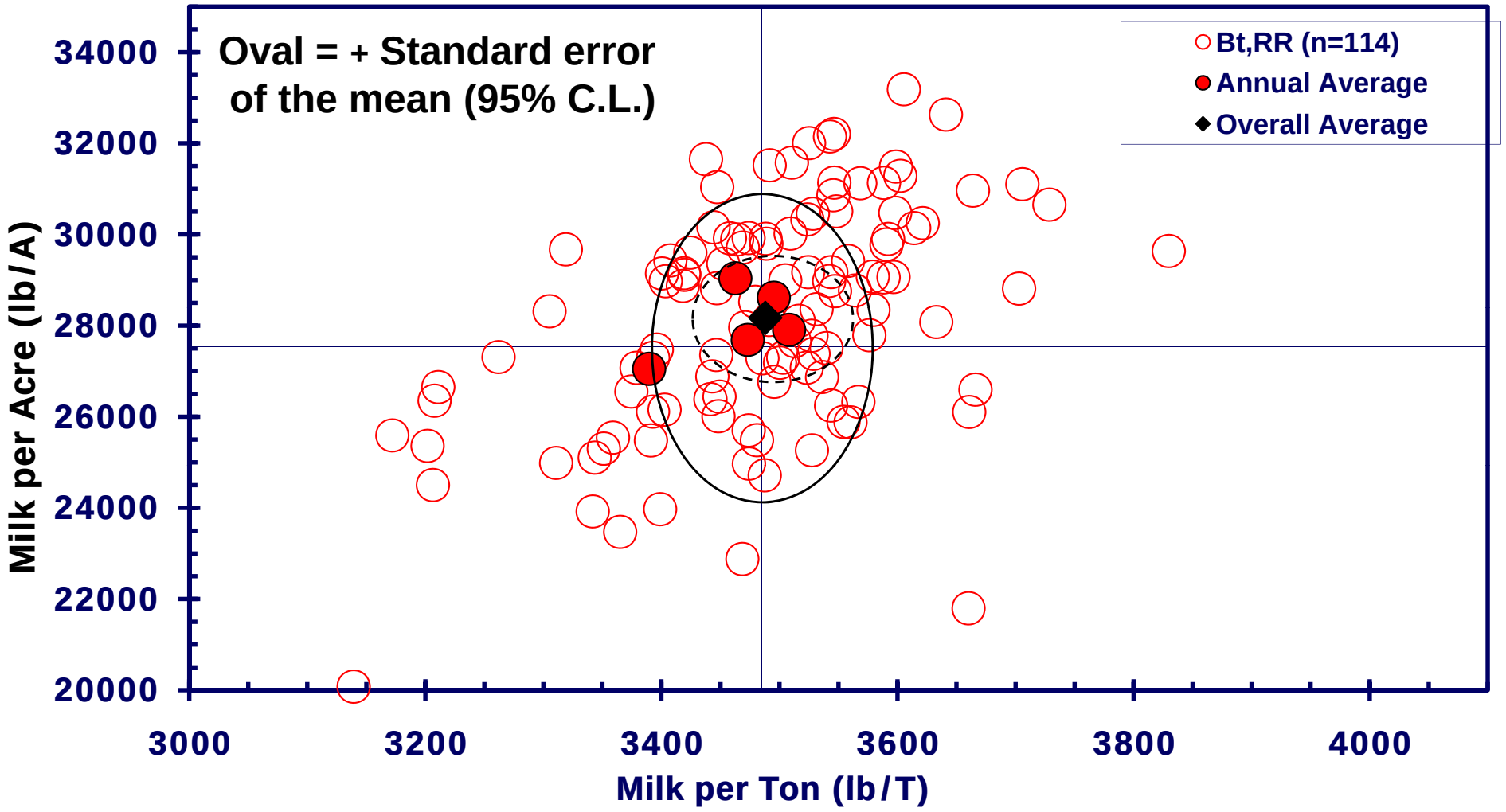
Relative Performance of Corn Bt Types Tested in the UW Silage Trials (1995-2003).



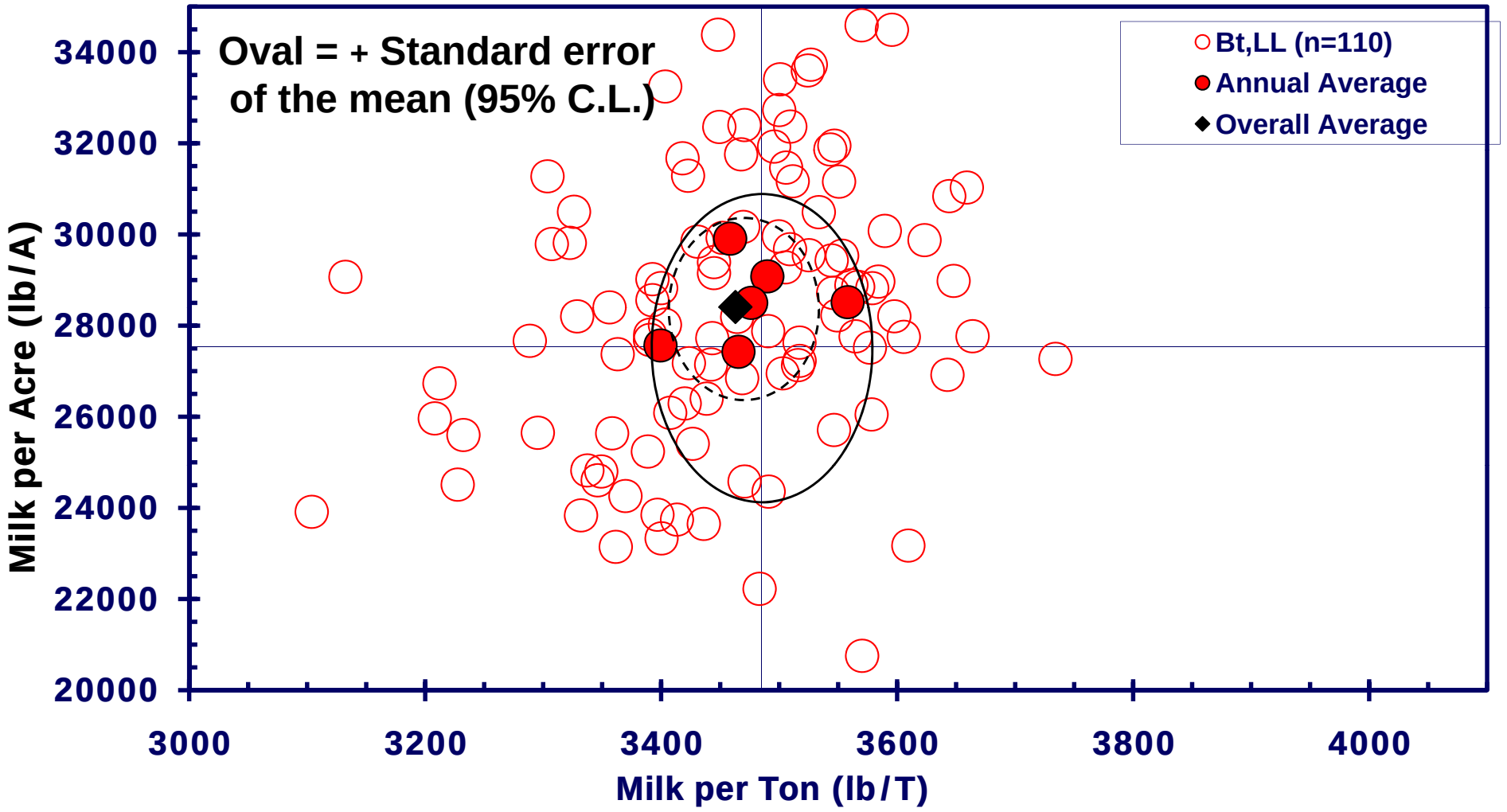
Relative Performance of Corn Roundup Ready Types Tested in the UW Silage Trials (1995-2003).



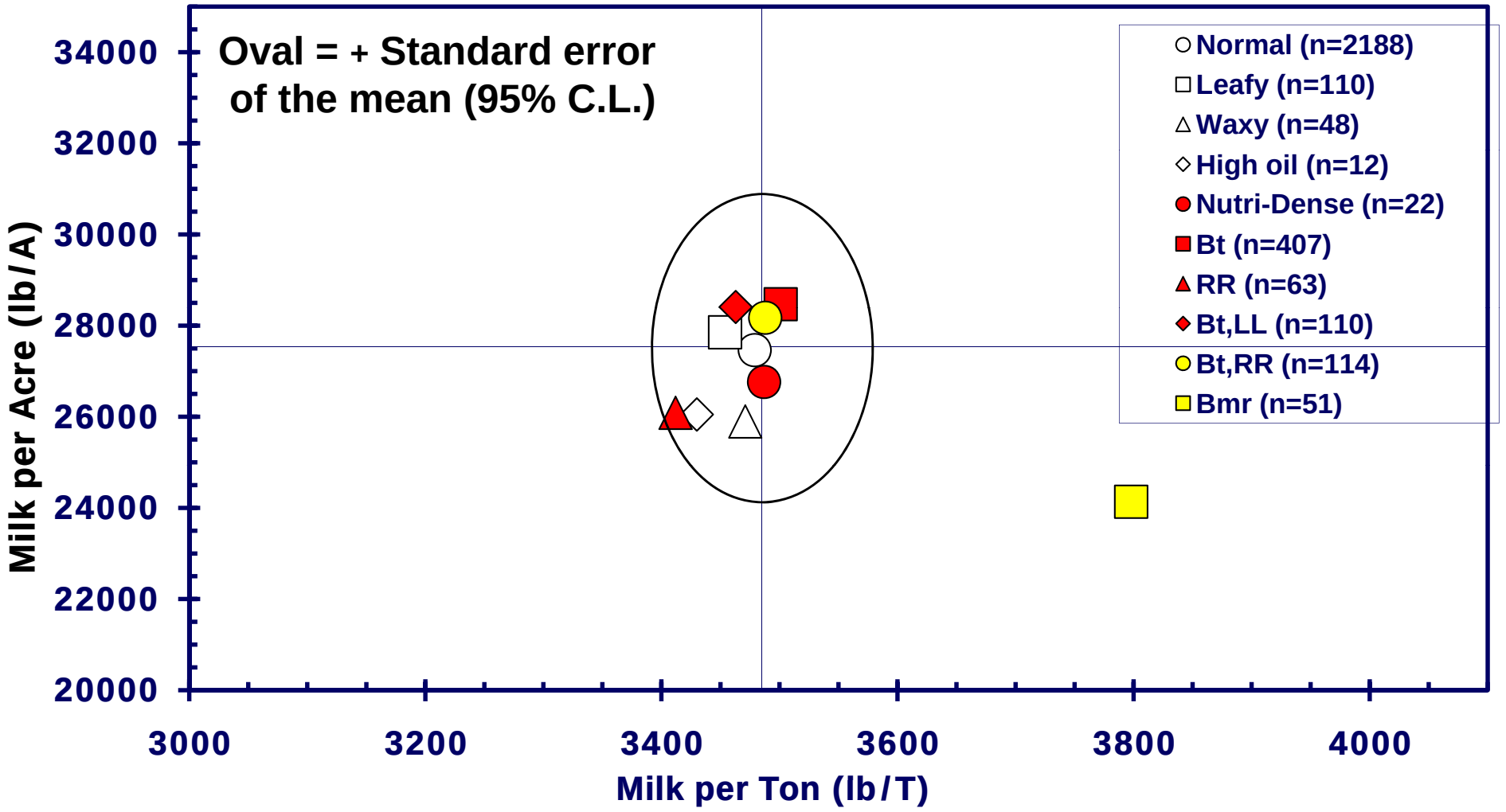
Relative Performance of Corn Bt,RR (Stacked) Types Tested in the UW Silage Trials (1995-2003).



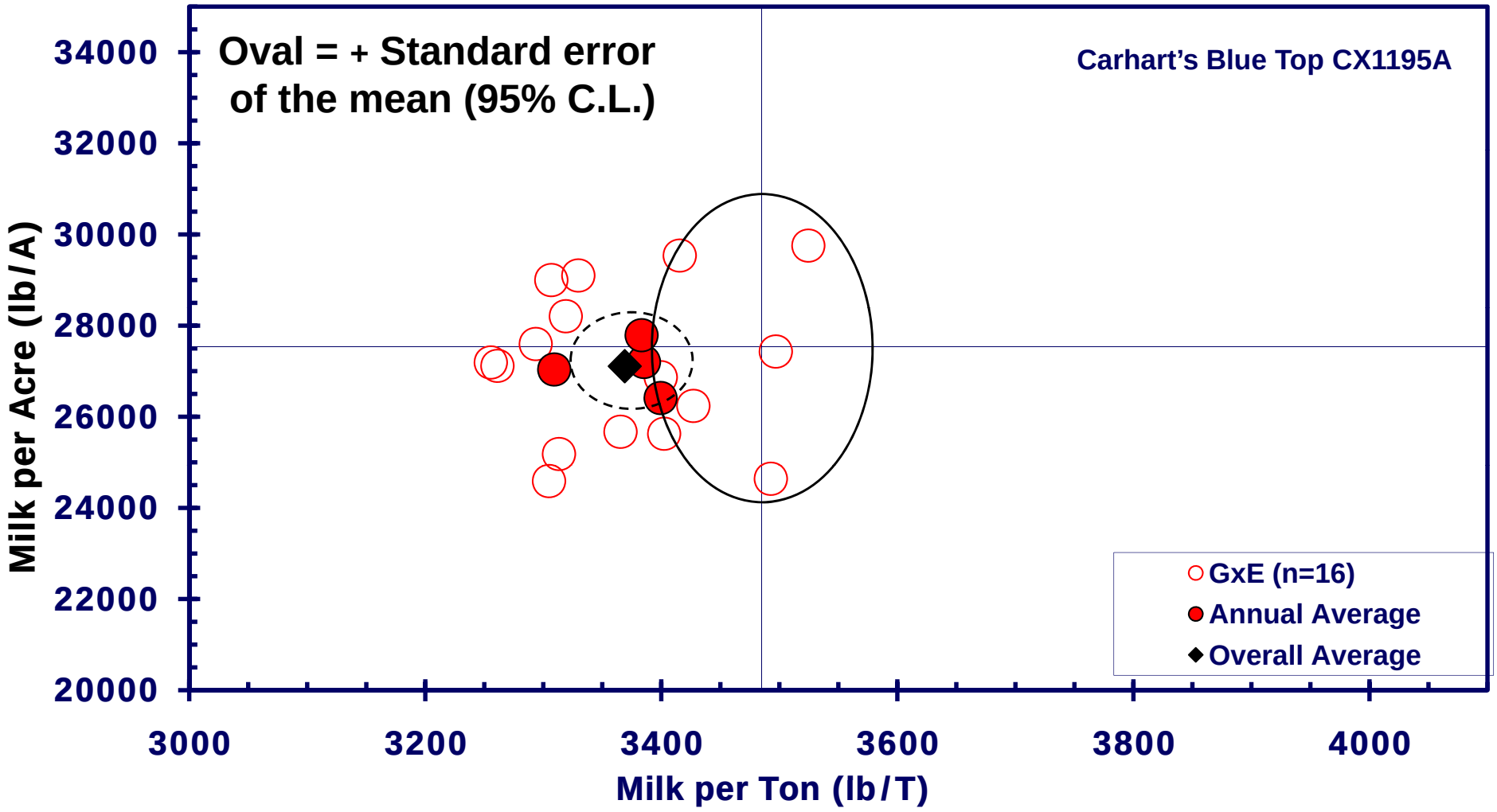
Relative Performance of Corn Bt,LL (Stacked) Types Tested in the UW Silage Trials (1995-2003).



Relative Performance of Corn Hybrids Tested in the UW Silage Trials (1995-2003).



Relative Performance of one Corn Hybrid Tested in the UW Silage Trials (1995-2003).



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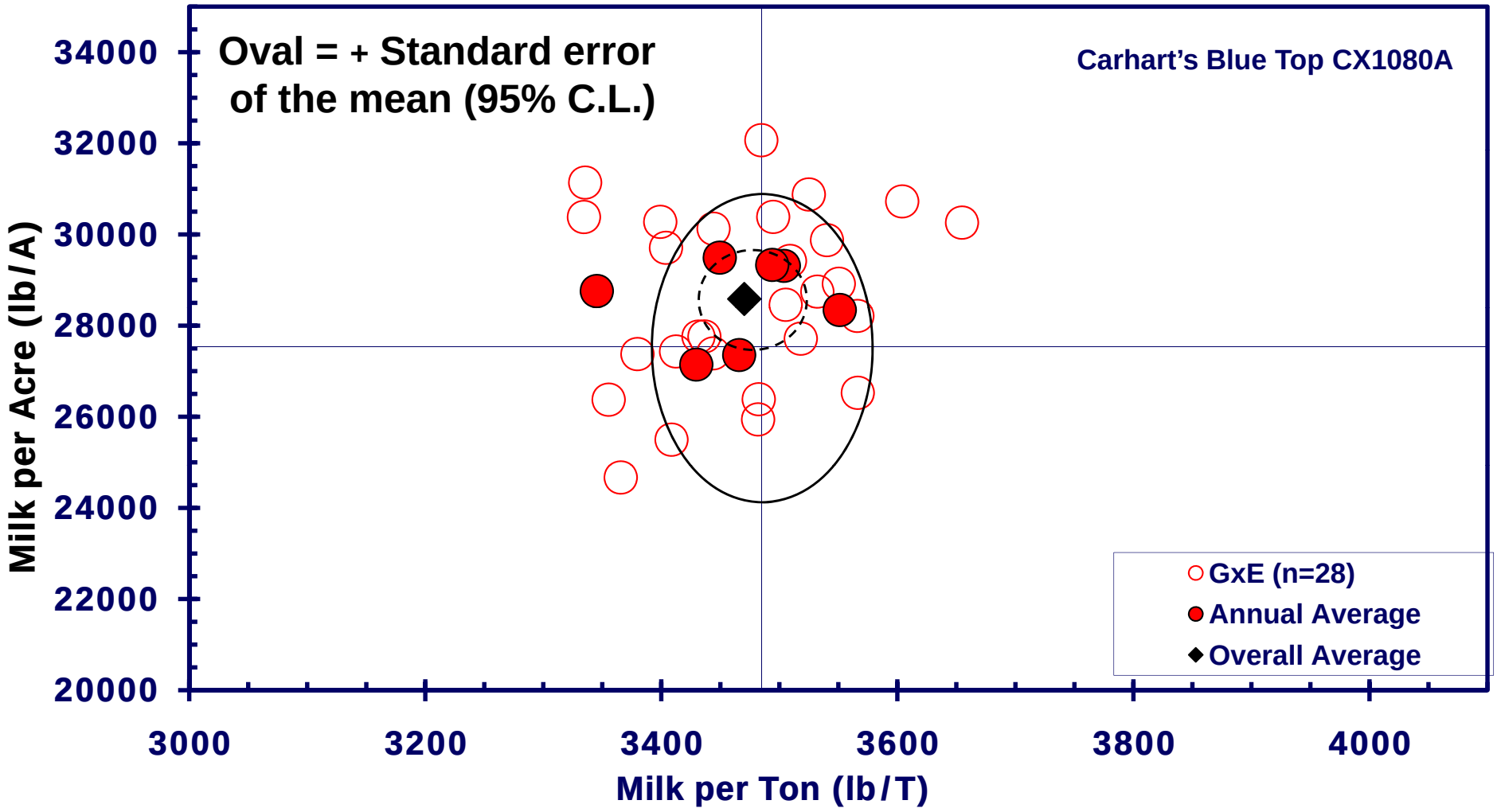

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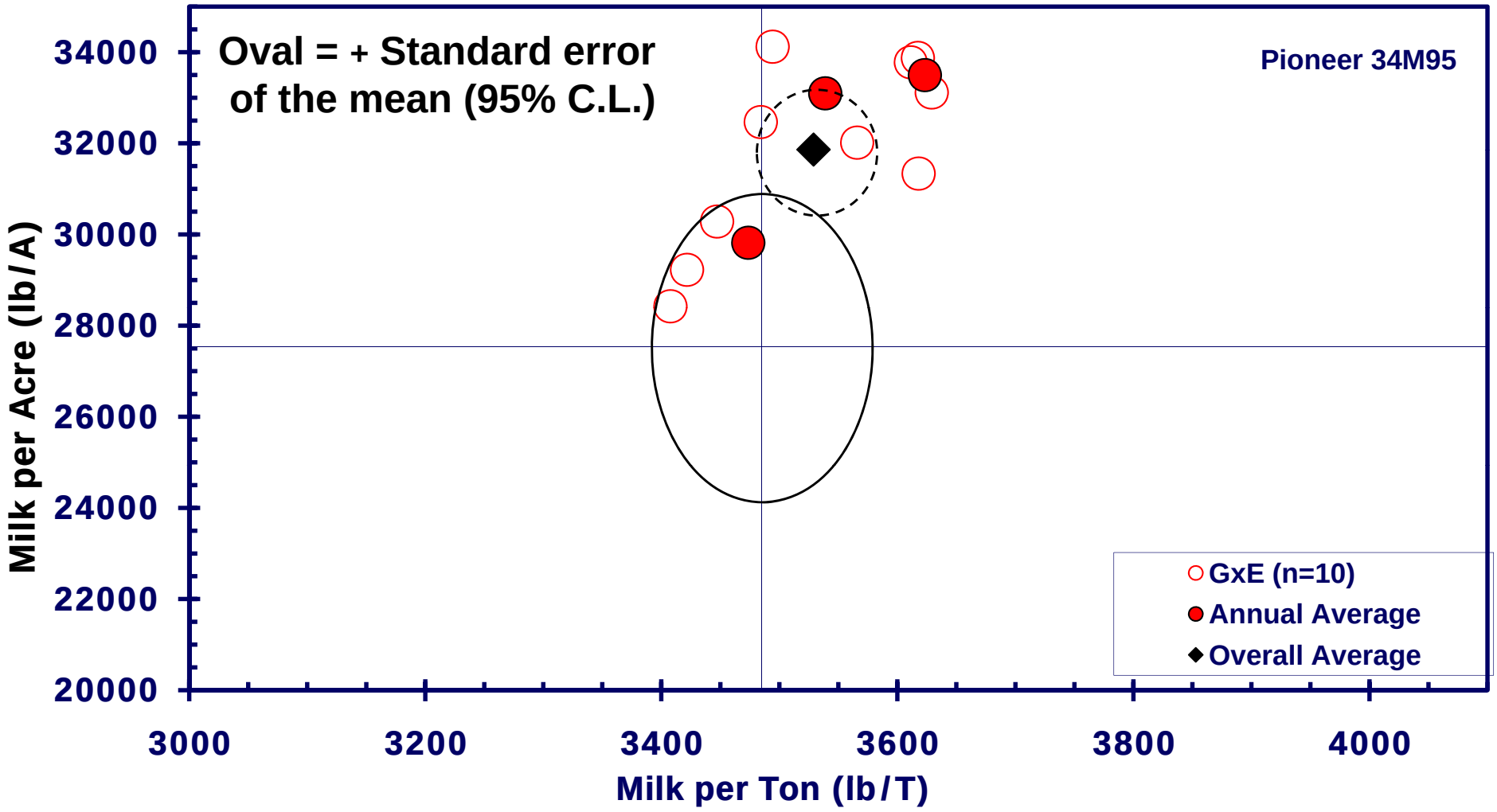
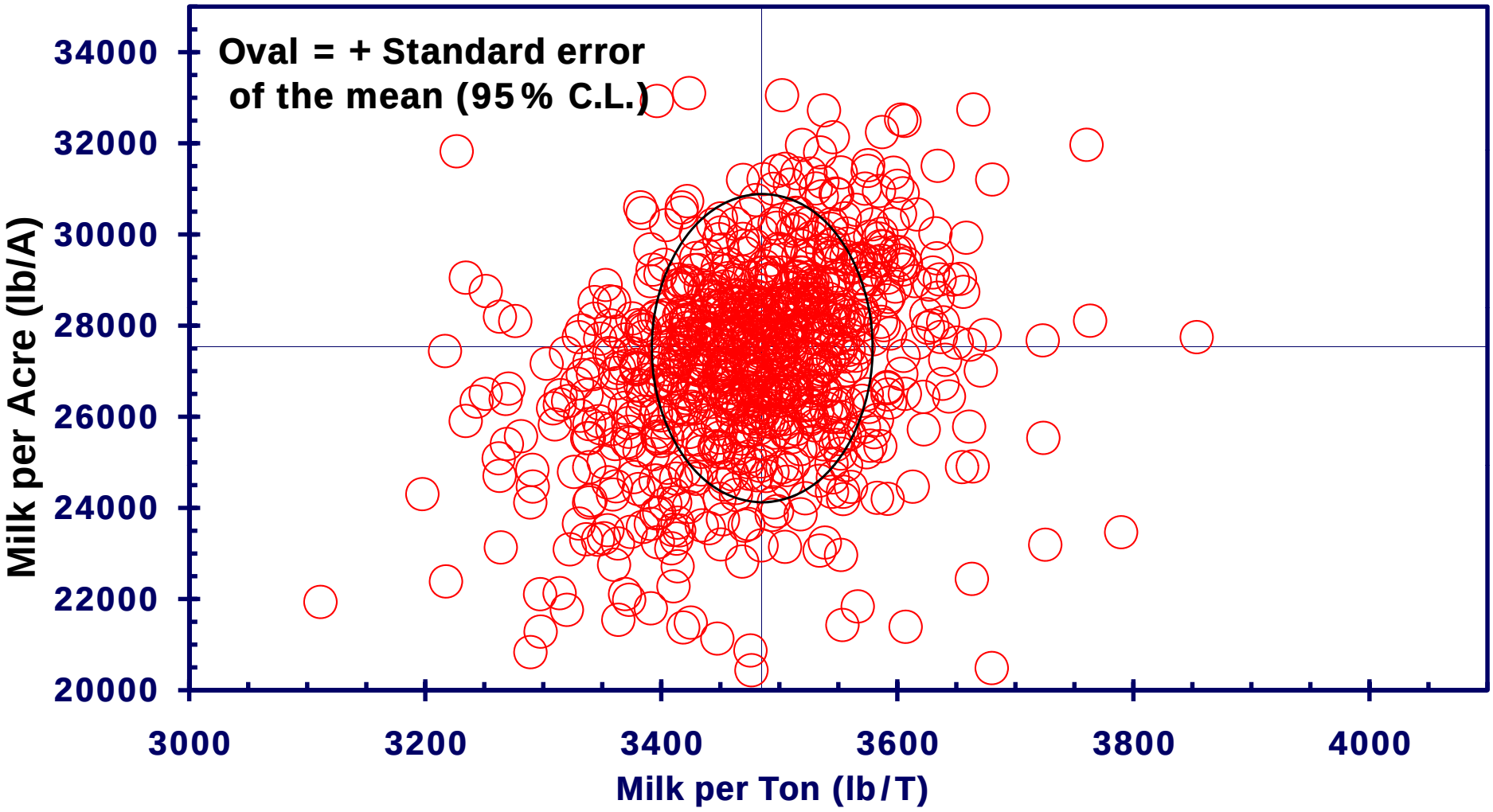
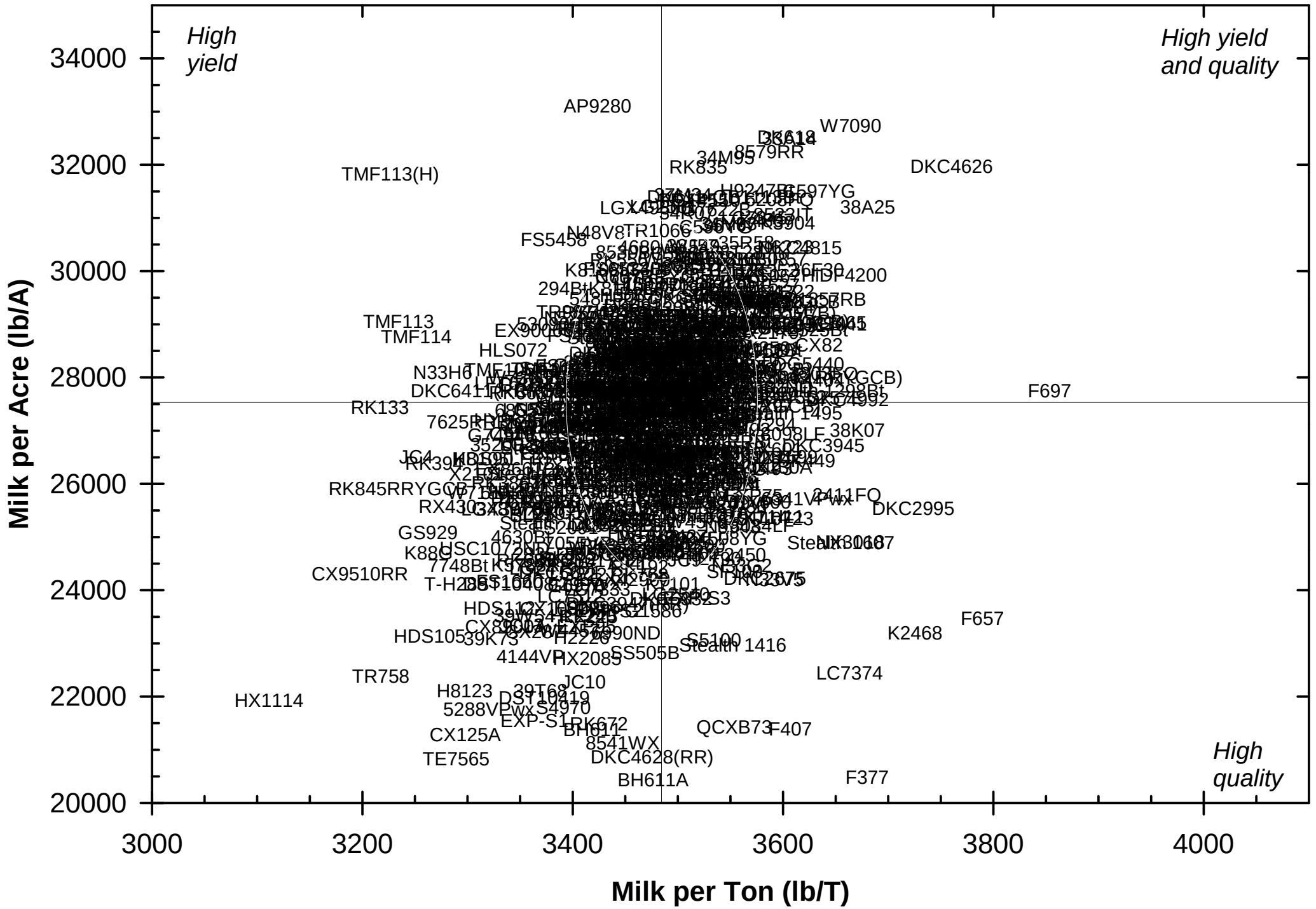


Relative Performance of Corn Hybrids Tested in the UW Silage Trials (1995-2003). Each value is a hybrid mean (n= 854 hybrids)



Relationship between milk per acre and milk per ton of corn hybrids in Wisconsin (n=854, 1995-2003).



Summary

- Numerous methods for achieving high yield and high quality corn silage
  - ✓ Many ways to “skin the cat”
  - ✓ Hybrid selection depends upon objectives of farmer
  - ✓ Management and hybrid selection go hand-in-hand
- Base hybrid selection decisions on performance.
  - ✓ Multi-location averages
  - ✓ Consistency
- Future direction
  - ✓ Starch degradation
  - ✓ Stover digestibility (digestion kinetics)
  - ✓ Continued improvement of Milk2000
  - ✓ Key: Animal feeding verification studies

Using Wisconsin Corn Hybrid Performance Trial Results

- Use multi-environment average data
  - ✓ Begin with trials in zone(s) nearest you
  - ✓ Compare hybrids with similar maturities
  - ✓ Use many years and locations
- Evaluate consistency of performance
  - ✓ Check performance in other zones and locations
  - ✓ Check other reliable unbiased trials
  - ✓ Be wary of inconsistent performance.
- SELECT at http://corn.agronomy.wisc.edu
- *You are taking a tremendous gamble if basing your hybrid selection decisions on 1 or 2 local test plots*

Criteria for Selecting Silage Hybrids

- Whole plant silage yield
- Grain yield: allows flexibility (dual purpose)
- Silage quality
- Relative maturity: 5-10 days later than grain hybrids
- Standability: allows flexibility
- Pest resistance

"Variation for silage yield and quality exists among commercial hybrids in Wisconsin."