

# Wisconsin Soil Test Summary: 2005-2009

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# Data obtained from WDATCP approved Labs

Over 1,079,000 in-state samples analyzed, 2005-2009

Soil pH

Bray-1 P

Bray-1 K

Organic matter

Secondary and micronutrients

# Wisconsin DATCP Approved Labs

Providing data for the summary

- A&L Great Lakes Laboratory
- Agsource Laboratory
- Dairyland Laboratory
- Mowers Soil Testing Laboratory
- Rock River Laboratory
- Soil and Plant Analysis Lab - Madison
- Soil and Forage Analysis Lab – Marshfield

# Data Summarized by:

Texture code

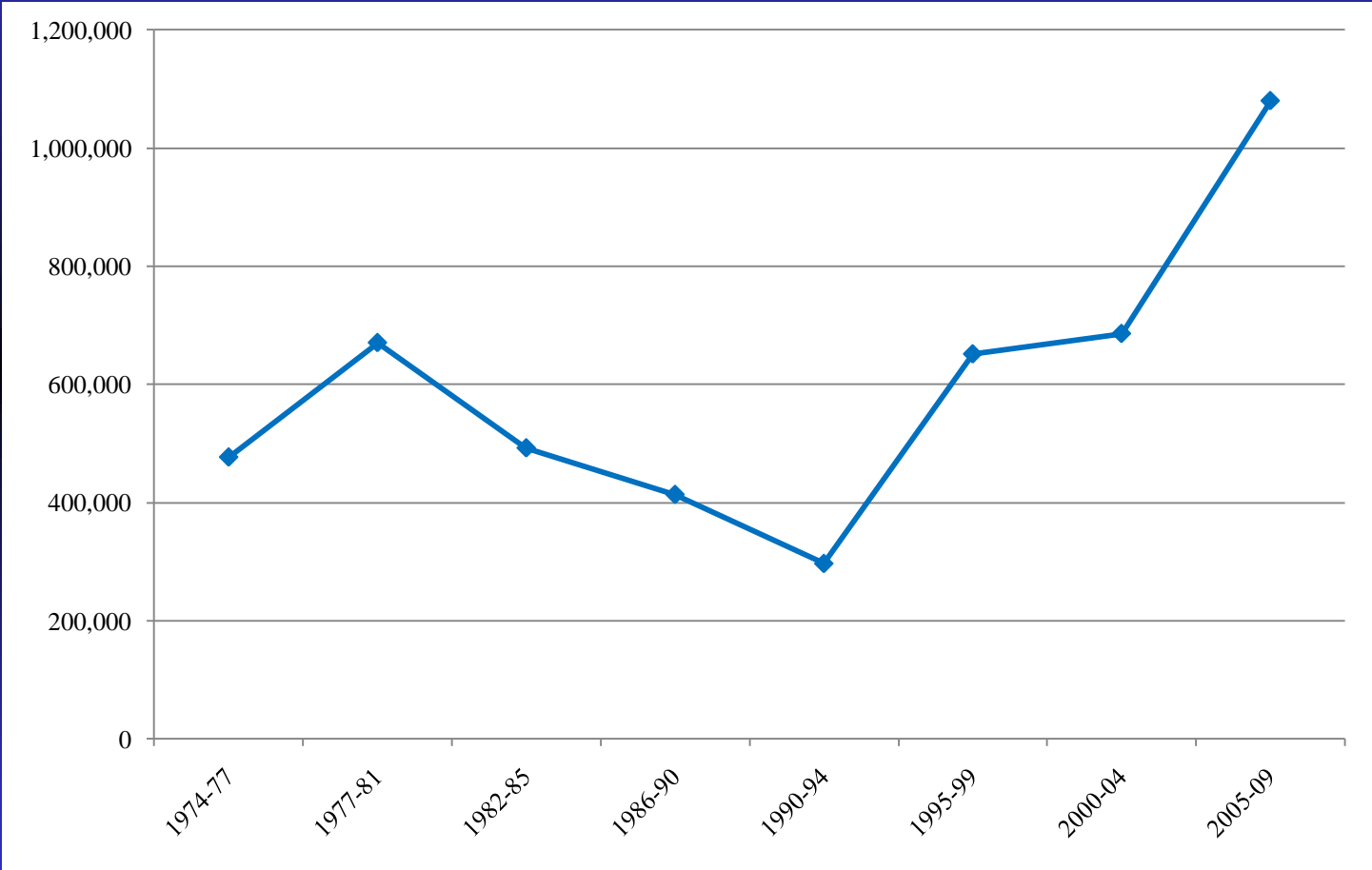
Soil series

County

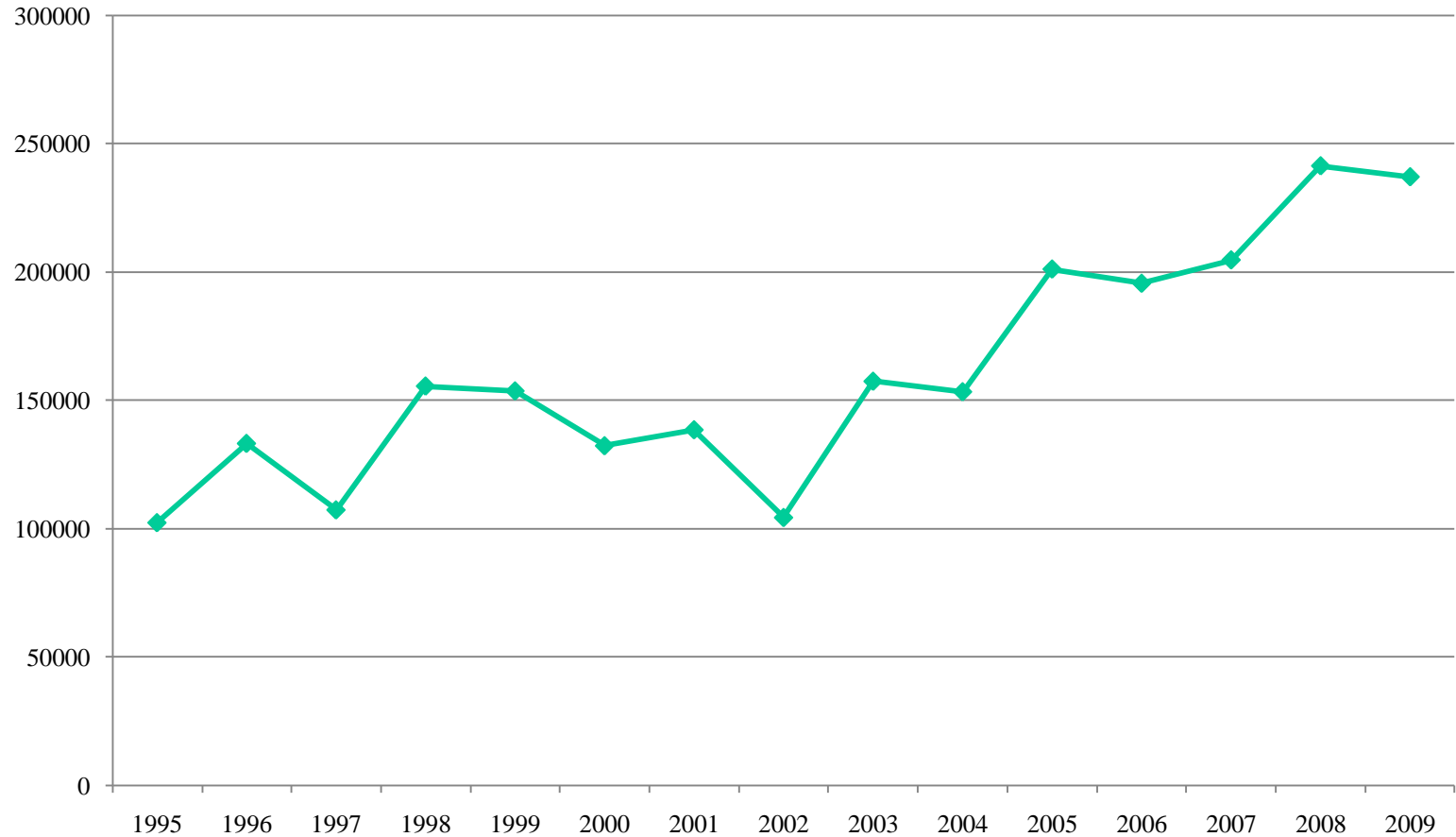
# Highlights

- 1,079,408 total samples analyzed (58% increase)
- 403,708 total fields tested
  - Average of 2.67 samples/field
- 50% of fields listed the acreage
  - Average of 15.45 acres/field
  - 2.80 samples/field when acreage indicated
  - 5.51 acres/sample (6.99 acres/sample in 2000-04)

# Sample Trends



# Recent Sample Trends



Average soil test pH, OM, P, and K results by soil texture/type.  
Wisconsin, 2005-09.

<b>Texture/Type</b>	<b>Number</b>	<b>pH</b>	<b>OM</b> %	<b>P</b> ----ppm----	<b>K</b>
all soils	1,079,408	6.6	3.0	51	126
coarse	95,346	6.3	1.4	84	103
med/fine	970,078	6.7	3.2	48	128
> 10% OM	12,579	6.3	32.0	63	128
red calcareous	526	7.3	2.9	38	144



## Distribution of soil test pH, OM, P, and K. Wisconsin, 2005-09.

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Soil Test	Quartile Estimate*			
	90	75	50**	25
	-----%-----			
pH	7.4	7.1	6.7	6.2
OM, %	4.5	3.6	2.9	2.3
P, ppm	110	62	35	20
K, ppm	208	152	110	80

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\*Percentage of all soil samples less than estimated value.

\*\*Median value, one-half test higher and one-half lower than this value.

Average soil test Ca, Mg, and Mn results by soil texture/type.  
Wisconsin, 2005-09.

<b>Texture/Type</b>	<b>Ca</b>	<b>Mg</b>	<b>Mn</b>
	<b>-----ppm-----</b>		
all soils	1559	389	23
coarse	603	121	19
med/fine	1615	412	24
> 10% OM	4440	708	9
red calcareous	1969	536	25

## Distribution of soil test Ca, Mg, and Mn. Wisconsin, 2005-09.

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Soil Test	Quartile Estimate*			
	90	75	50**	25
	-----%-----			
Ca, ppm	2460	1880	1460	1020
Mg, ppm	670	521	371	220
Mn, ppm	35	29	23	17

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\*Percentage of all soil samples less than estimated value.

\*\*Median value, one-half test higher and one-half lower than this value.

Average soil test B, S, and Zn results by soil texture/type.  
Wisconsin, 2005-09.

<b>Texture/Type</b>	<b>B</b>	<b>S</b>	<b>Zn</b>
	<b>-----ppm-----</b>		
all soils	0.62	6.6	5.1
coarse	0.41	6.6	5.5
med/fine	0.63	6.4	5.0
> 10% OM	1.07	25.7	8.7
red calcareous	1.20	9.6	12.6

## Distribution of soil test B, S, and Zn. Wisconsin, 2005-09.

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Soil Test	Quartile Estimate*			
	90	75	50**	25
	-----%-----			
B, ppm	1.0	0.7	0.5	0.4
S, ppm	10.3	7.1	5.0	3.0
Zn, ppm	8.3	5.2	3.4	2.3

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\*Percentage of all soil samples less than estimated value.

\*\*Median value, one-half test higher and one-half lower than this value.

# Soil Series Distribution

## 789 Soils in RFS Program

- 8 soils – listed more than 10,000 times
- 16 – 5000-10,000
- 72 – 1000-5000
- 73 – 501-1000
- 90 – 201-500
- 195 – 26-200
- 197 – 1-25
- 138 Soils never used at all in five years

Average soil test P, K, pH, and OM for the top ten named soils.  
Wisconsin, 2005-09.

Soil Name	Soil Group	Number	% of soils*	pH	OM %	P ---ppm---	K
Kewaunee	C	37635	7.6	7.1	3.2	34	116
Hortonville	C	21650	4.7	7.2	3.0	38	118
Loyal	D	15872	3.7	6.6	3.5	37	130
Plano	B	14896	3.6	6.5	3.6	57	166
Withee	D	13957	3.5	6.5	3.6	37	131
Onaway	C	13640	3.5	7.1	2.6	40	119
Fayette	A	12506	3.3	6.6	2.9	37	107
Plainfield	E	12031	3.3	6.2	1.3	129	103
Seaton	A	8864	2.5	6.6	2.8	44	131
Manawa	C	8686	2.5	7.1	3.6	33	116

\* Percentage of named soils.

Distribution of soil test P and K for the top ten named soils. Wisconsin, 2005-09.

Soil Name	Quartile Estimate			
	P		K	
	90	50	90	50
	-----%-----			
Kewaunee	68	24	184	103
Hortonville	78	25	193	103
Loyal	64	31	222	116
Plano	109	46	275	146
Withee	63	31	216	118
Onaway	85	27	208	101
Fayette	76	26	167	94
Plainfield	209	130	159	96
Seaton	89	34	214	108
Manawa	68	24	183	103



Comparison of mean and median soil test values by texture category. Wisconsin, 2005-09.

Parameter	Med/fine soils		Sandy soils	
	Mean	Median	Mean	Median
P	48	33	84	61
K	128	112	103	95
pH	6.7	6.7	6.3	6.3
OM	3.2	3.0	1.4	1.3

Comparison of mean and median micro-nutrient soil test values by texture category. Wisconsin, 2005-09.

Parameter	Med/fine soils		Sandy soils	
	Mean	Median	Mean	Median
	-----%-----			
B	0.63	0.60	0.41	0.30
Zn	5.0	3.3	5.5	4.2
Mn	24	23	19	19

# Counties With Most Soil Samples

>30,000

- Dane – 72,326
- Lafayette – 42,975
- Green – 40,176
- Clark – 36,966
- Grant – 36,702
- Dodge – 32,376
- Columbia – 31,968
- Fond du Lac – 31,376
- Marathon – 30,999

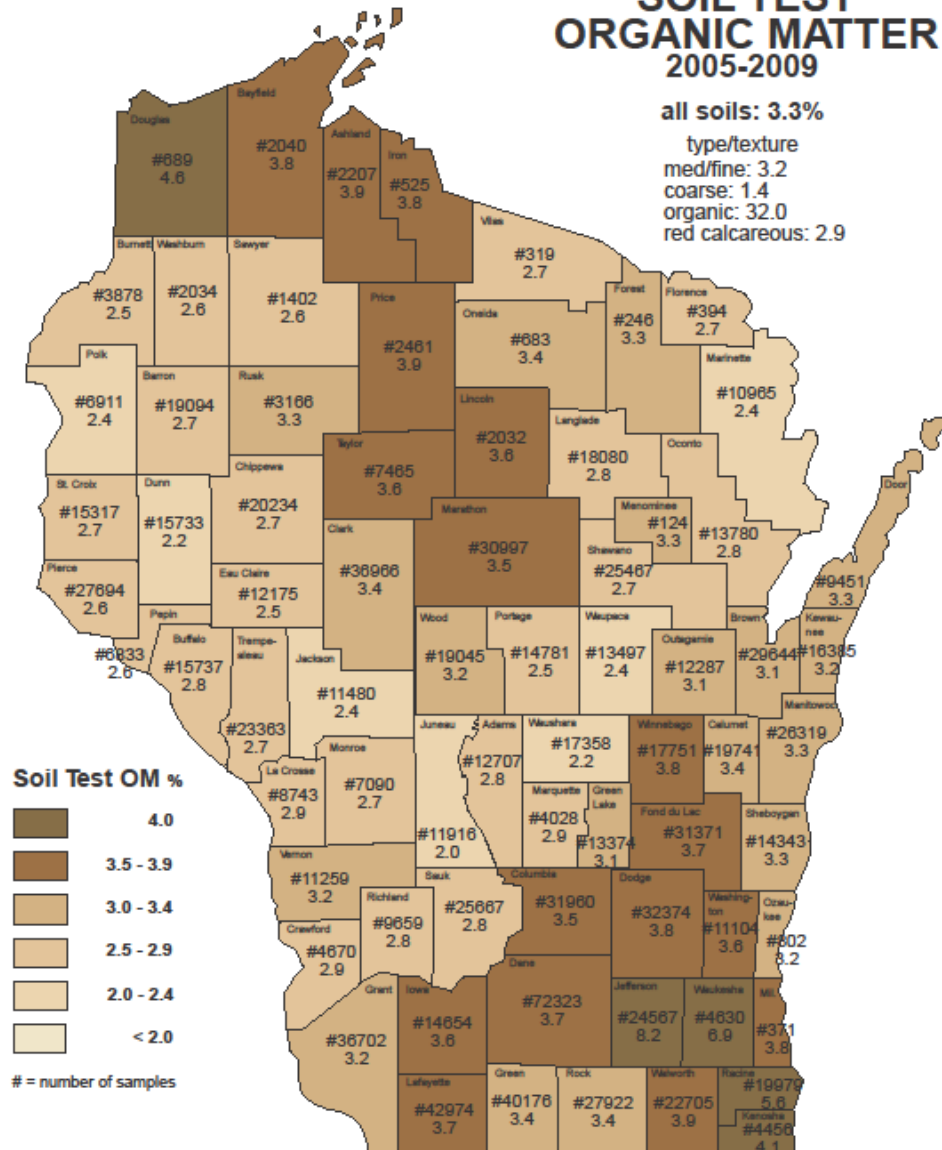
# Counties With Fewest Soil Samples <500

- Florence – 394
- Milwaukee – 371
- Vilas – 319
- Forest – 246
- Menominee - 124

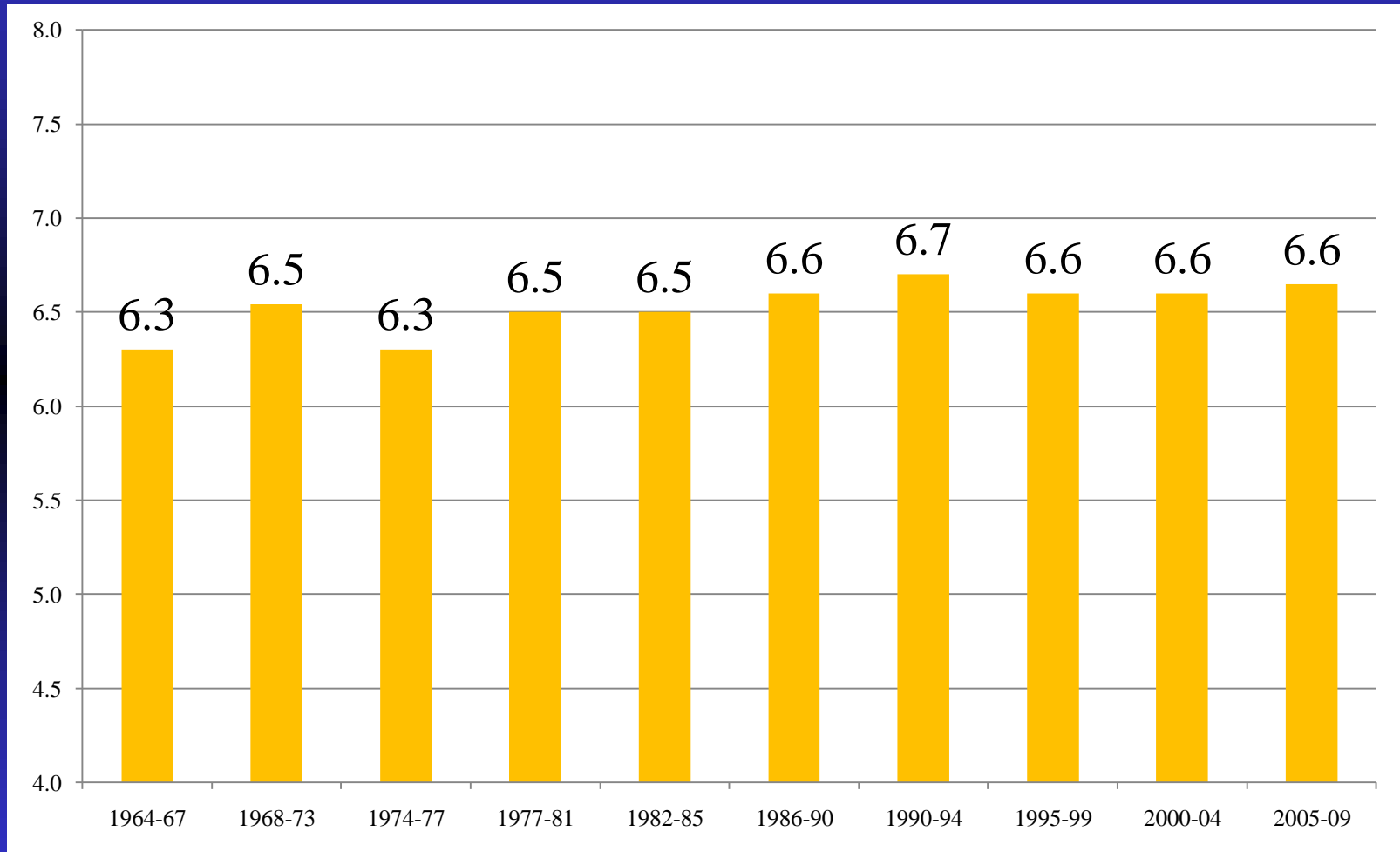
# SOIL TEST ORGANIC MATTER 2005-2009

all soils: 3.3%

type/texture  
med/fine: 3.2  
coarse: 1.4  
organic: 32.0  
red calcareous: 2.9



# Wisconsin Soil Test pH Trends: 1964-2009



# SOIL TEST pH 2005-2009

all soils: 6.6

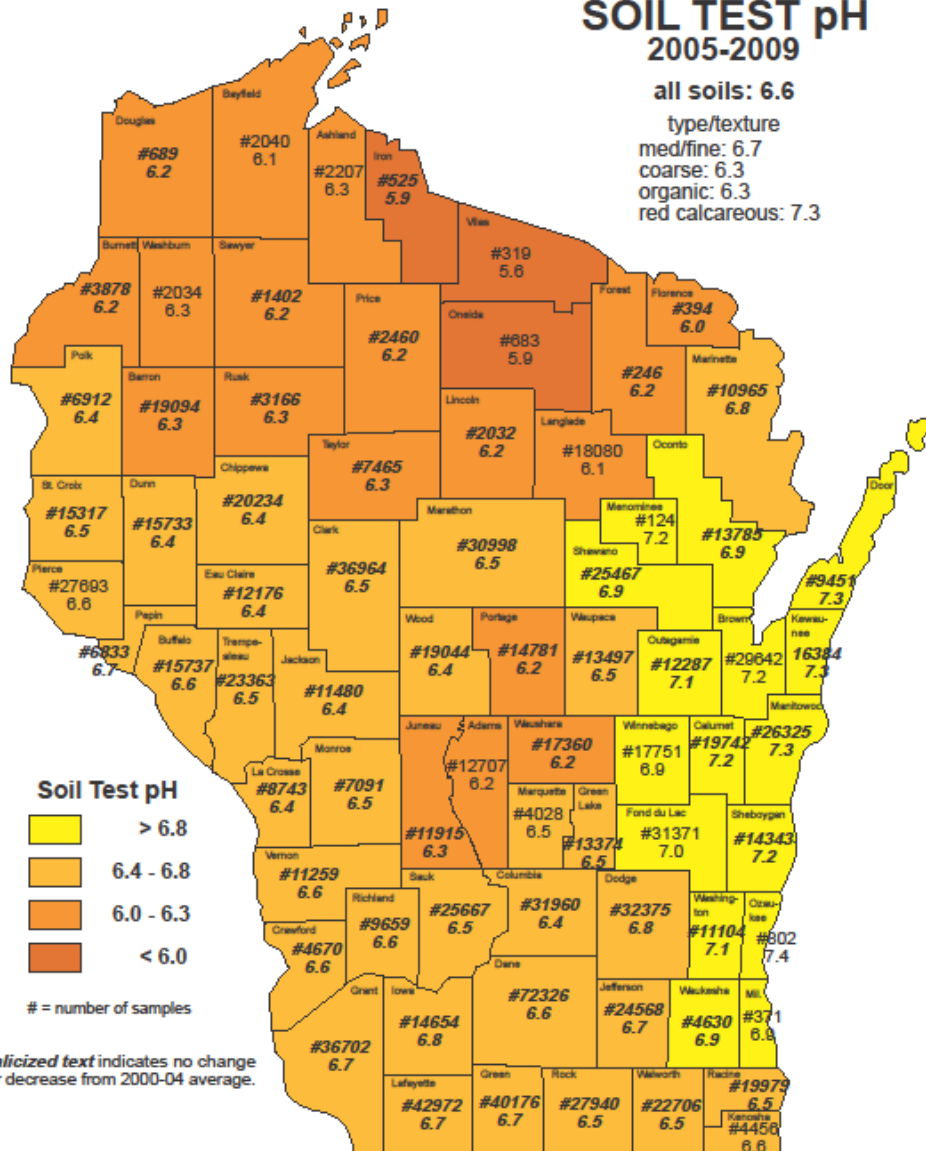
type/texture

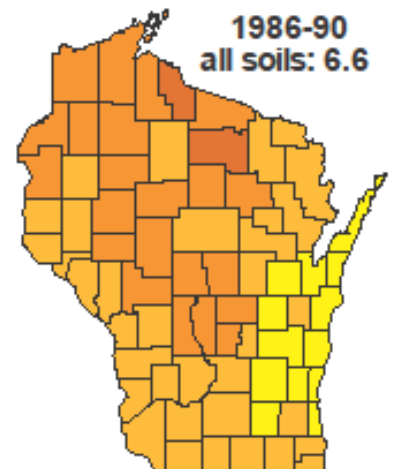
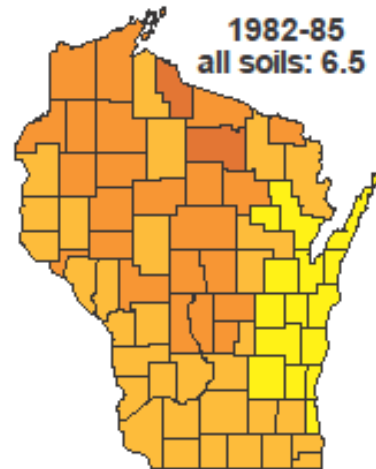
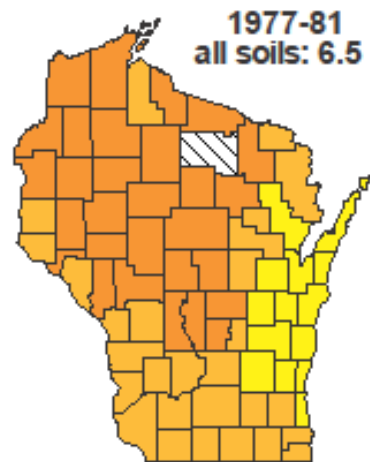
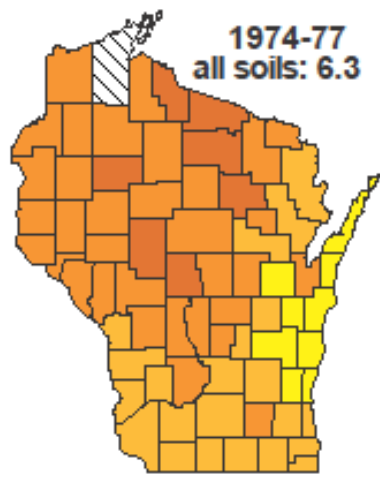
med/fine: 6.7

coarse: 6.3

organic: 6.3

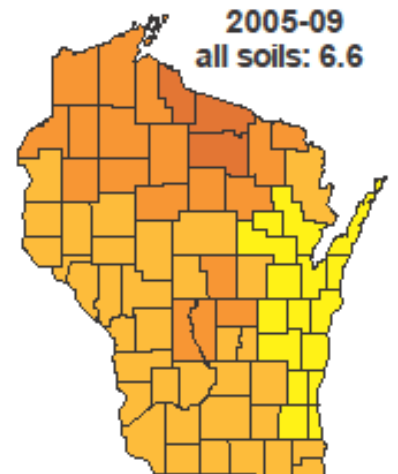
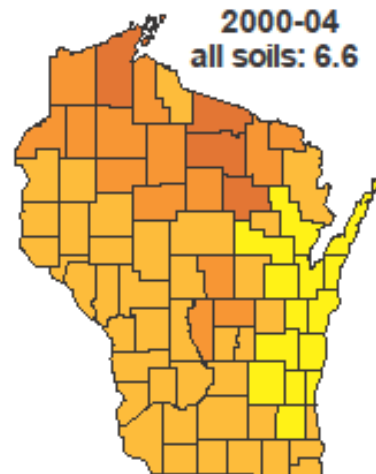
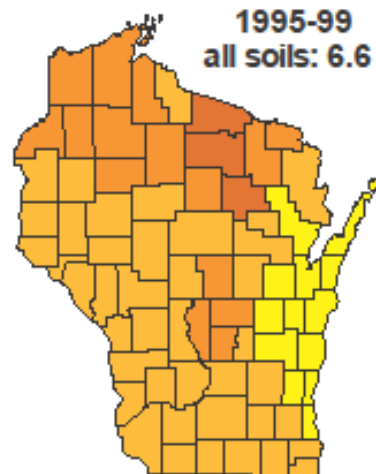
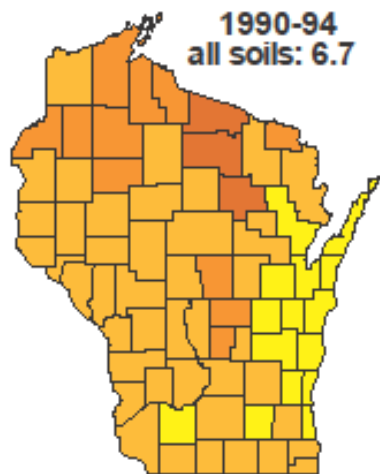
red calcareous: 7.3





**SOIL TEST pH**

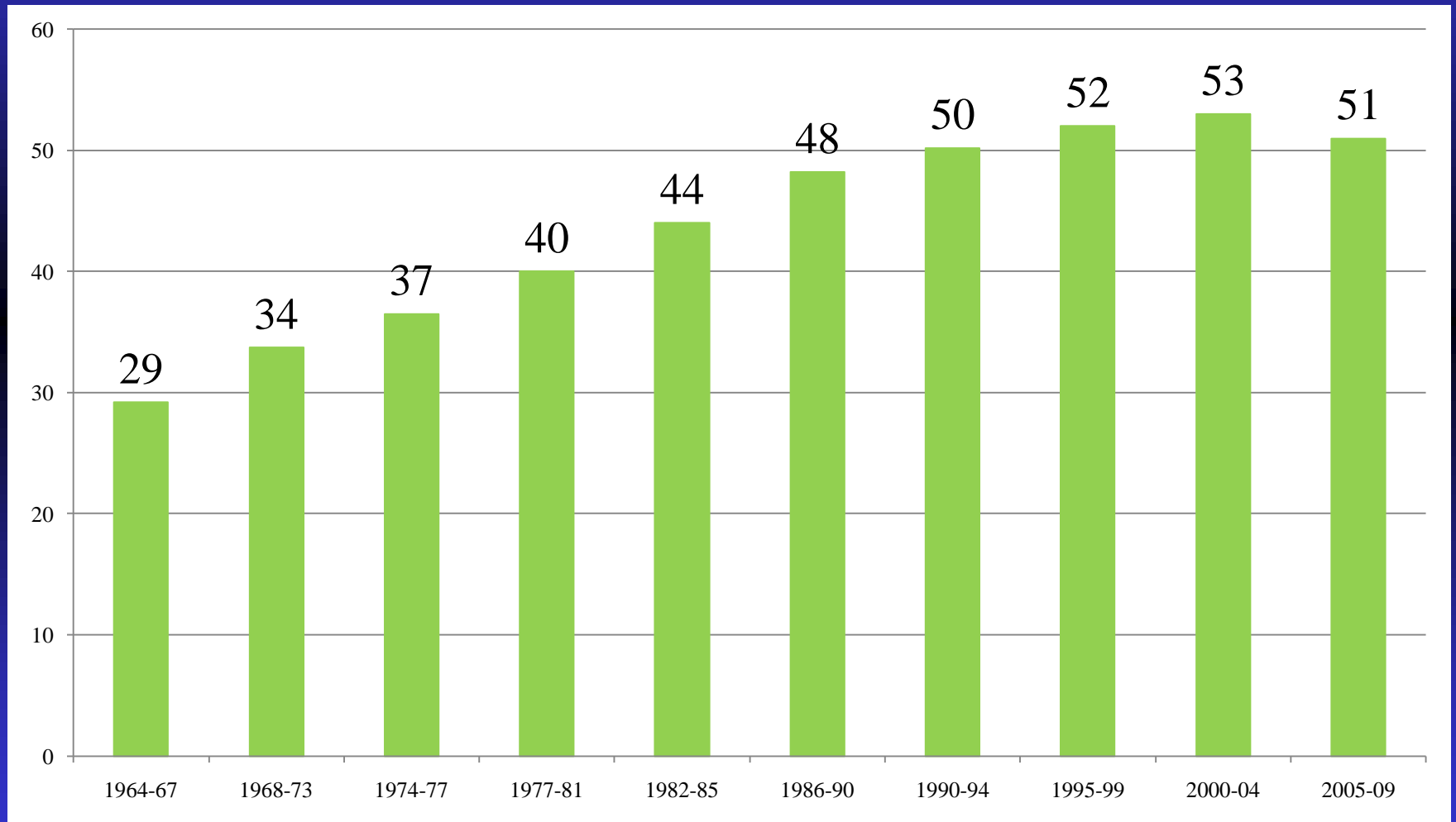
**1974-2009**



pH  > 6.8  6.4 - 6.8  6.0 - 6.3  < 6.0  Not available



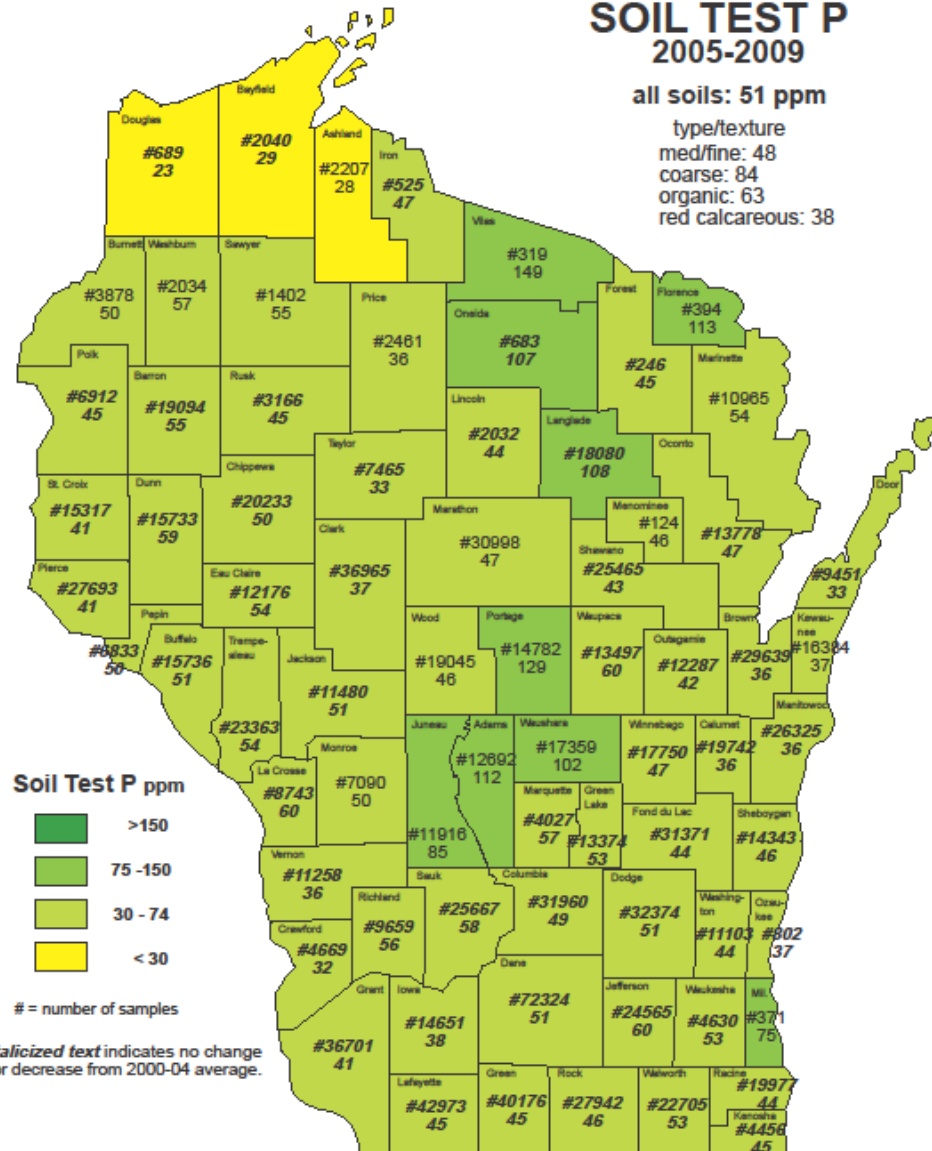
# Wisconsin Soil Test P Trends: 1964-2009

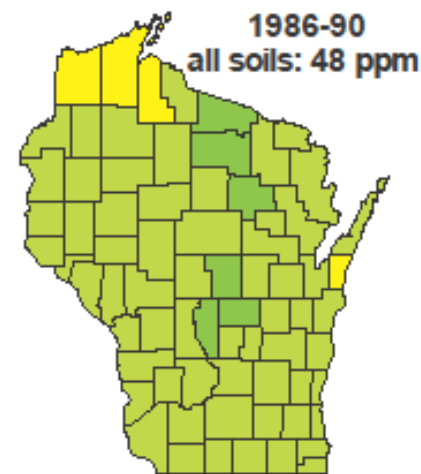
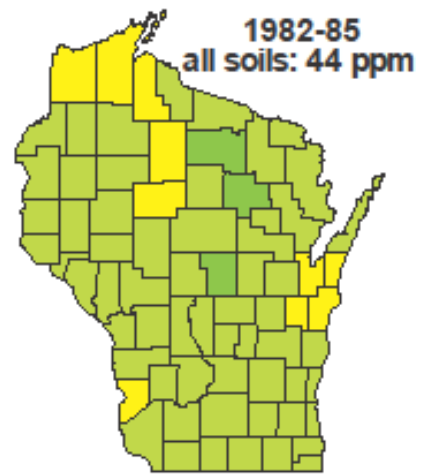
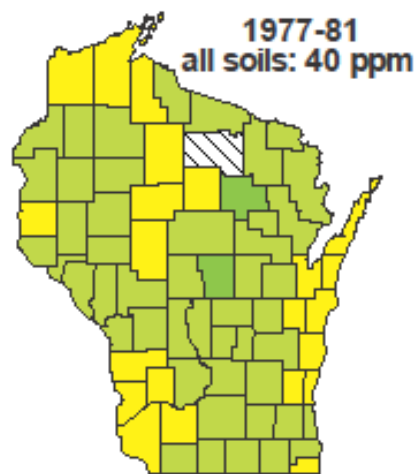
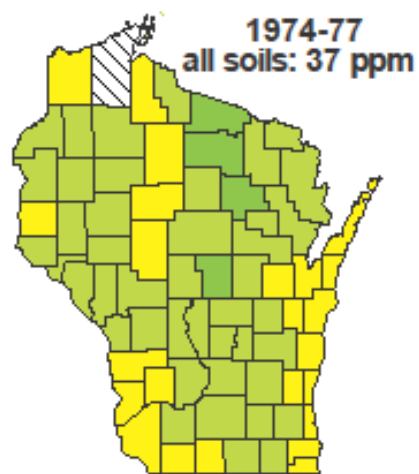


# SOIL TEST P 2005-2009

all soils: 51 ppm

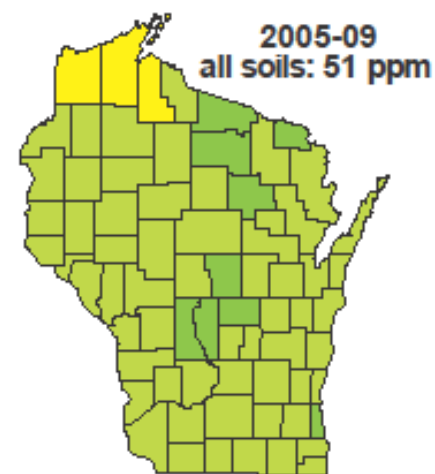
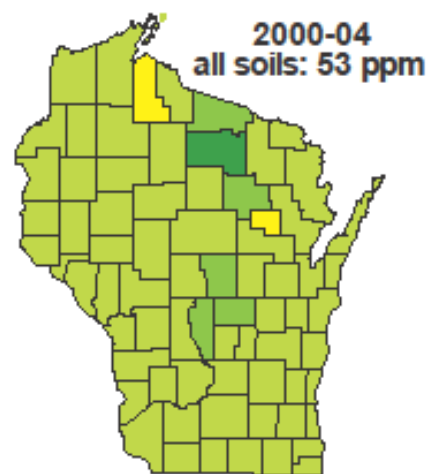
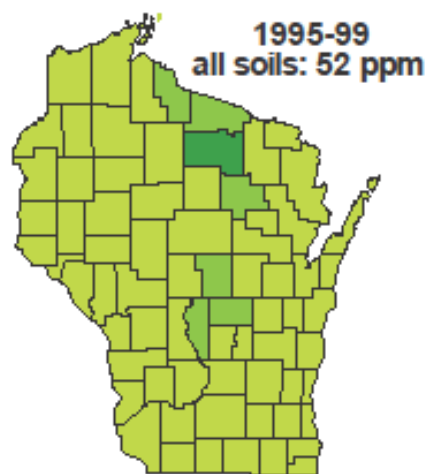
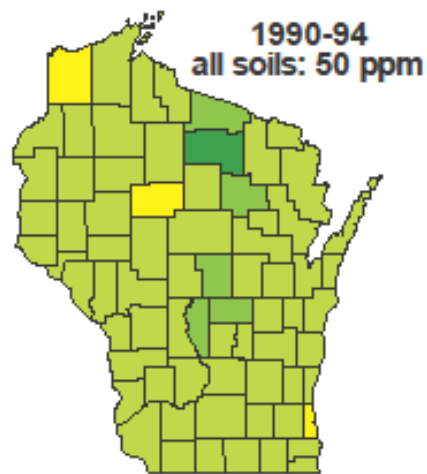
type/texture  
med/fine: 48  
coarse: 84  
organic: 63  
red calcareous: 38





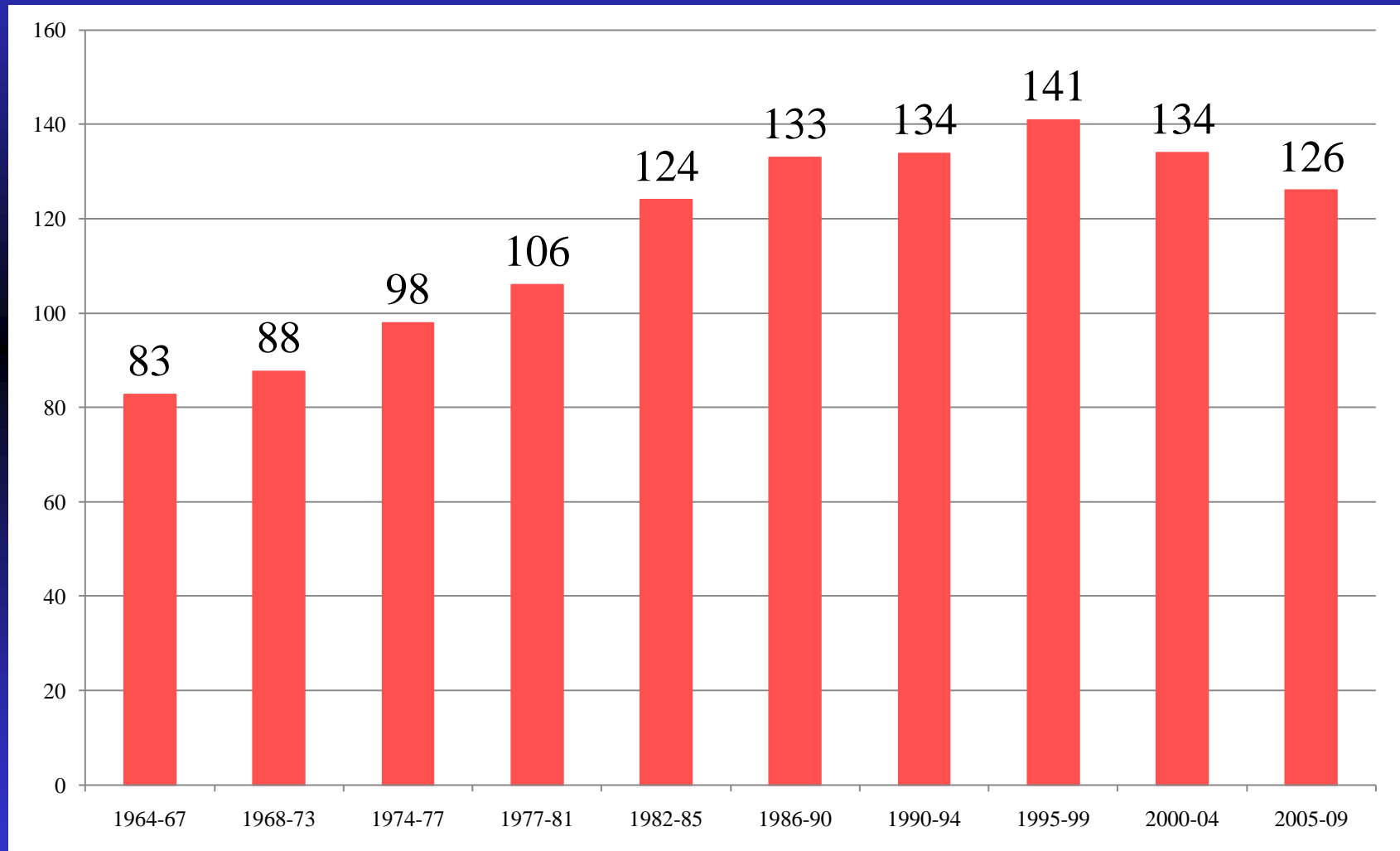
**SOIL TEST P**

1974-2009



P ppm    > 150    75 -150    30 - 74    < 30    Not available

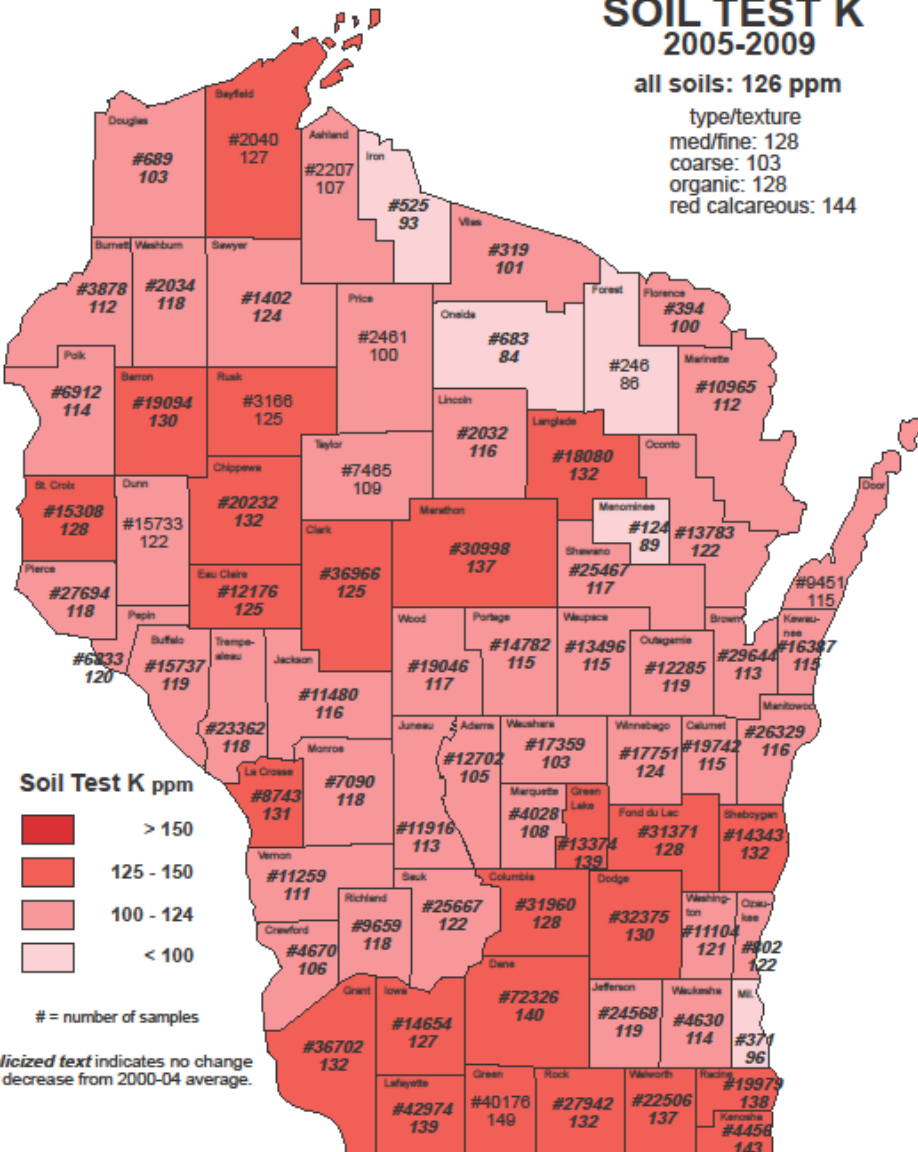
# Wisconsin Soil Test K Trends: 1964-2009

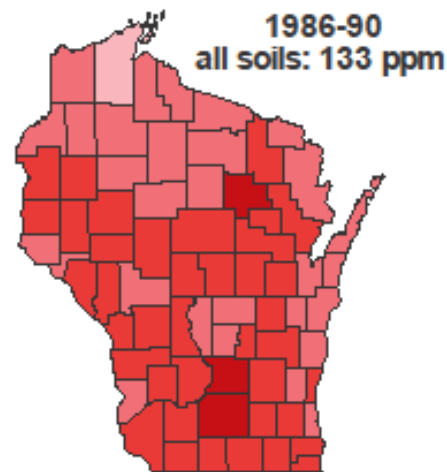
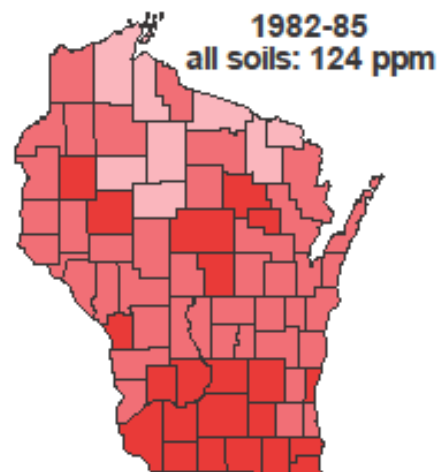
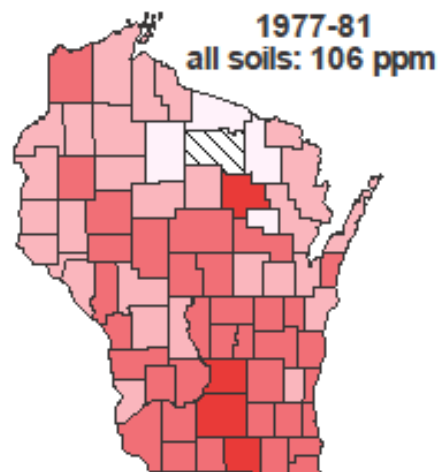
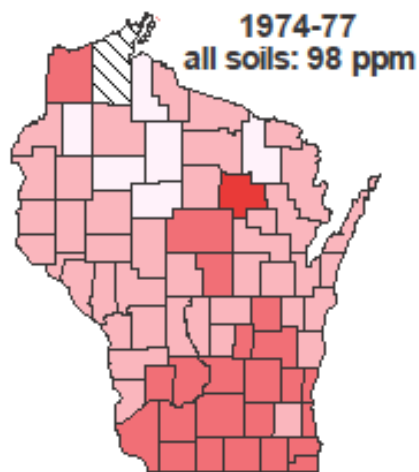


# SOIL TEST K 2005-2009

all soils: 126 ppm

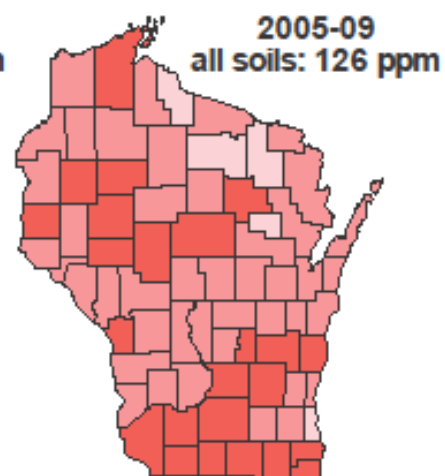
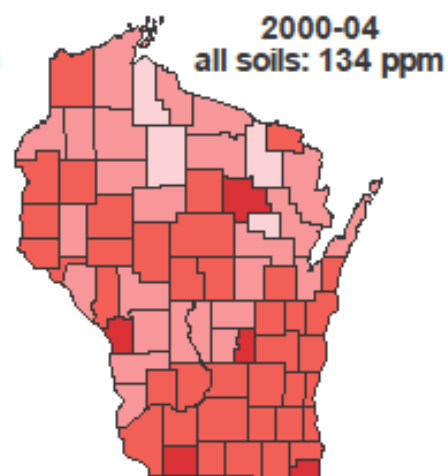
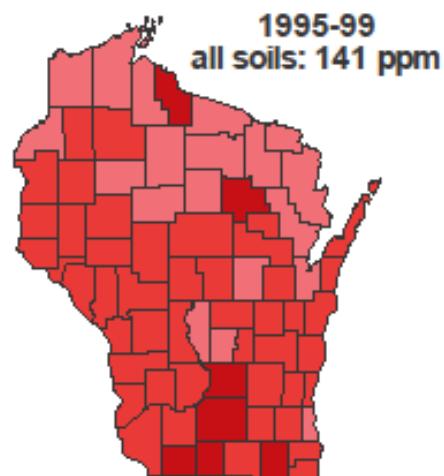
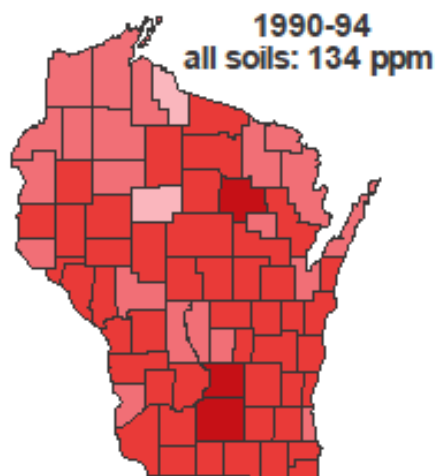
type/texture  
med/fine: 128  
coarse: 103  
organic: 128  
red calcareous: 144





**SOIL TEST K**

**1974-2009**



K ppm >150 125 -150 100 -124 75 - 99 < 75 Not available

# Most Common Crop Codes

- 327,945 – corn, grain
- 230,579 – alfalfa, established
- 187,366 – soybean, grain
- 72,454 – corn, silage
- 71,702 – alfalfa, seeding
- 49,737 – wheat, grain + straw
- 38,940 – oats, grain + straw

# Most Common Crop Codes

- 13,251 – pasture, legume(<30%)-grass
- 12,443 – pasture, managed
- 10,142 – red clover
- 5,596 – sweet corn
- 5,564 – small grain/legume silage, w/alfalfa seeding
- 4,448 – snapbean
- 4,246 – wheat, grain
- 4,023 – potato



# Least Common Crop Codes

- 27 – Brussels sprouts
- 36 – lupin
- 38 – flax
- 39 – triticale, grain + straw
- 42 – cauliflower
- 54 – cherry, establishment
- 62 – spinach
- 64 – pasture, legume(>30%)-grass
- 68 – corn, popcorn
- 74 – vetch, crown/hairy
- 80 – millet
- 81 – celery
- 85 - broccoli

# Legume Credits

- 19% of 403,708 fields list a previous legume crop
- **77% of crops listed were actual legumes**
- 31,204 listed alfalfa, established
- 21,527 listed soybean, grain
- 11,648 listed corn, grain (erroneously)
- 2,495 listed corn, silage (erroneously)
- 2,415 listed alfalfa, seeding
- 1,448 listed pasture, legume(<30%)-grass
- 1,125 listed red clover

# Manure Credits

- 7,663 fields (2% of total) list a manure application
- 3,250 solid dairy manure, 20 tons/acre average
- 2,550 liquid dairy manure, 7,000 gal/acre average
- 865 solid beef manure, 11 tons/acre average
- 338 solid chicken manure, 9 tons/acre average
- 139 liquid swine manure, 4,500 gal/acre
- 128 liquid beef manure, 5,700 gal/acre
- All others below 125 fields each

# Irrigated Fields

- 6,585 fields with 37,910 samples were irrigated – 1.6% of total fields and 3.5% of total samples
- 74% of the irrigated fields listed acreage, which averaged 49.4 acres/field and 7.6 acres/sample

# Reduced Tillage

- 2.5% of fields indicate conservation tillage is used
- Most frequently listed crops include
  - Corn, grain
  - Soybean, grain
  - Alfalfa, established
  - Corn, silage

# Slope

- 10.7% of total fields indicated a slope
- 43,327 fields average slope was 5%
- Median slope = 4%

# Spring vs. Fall

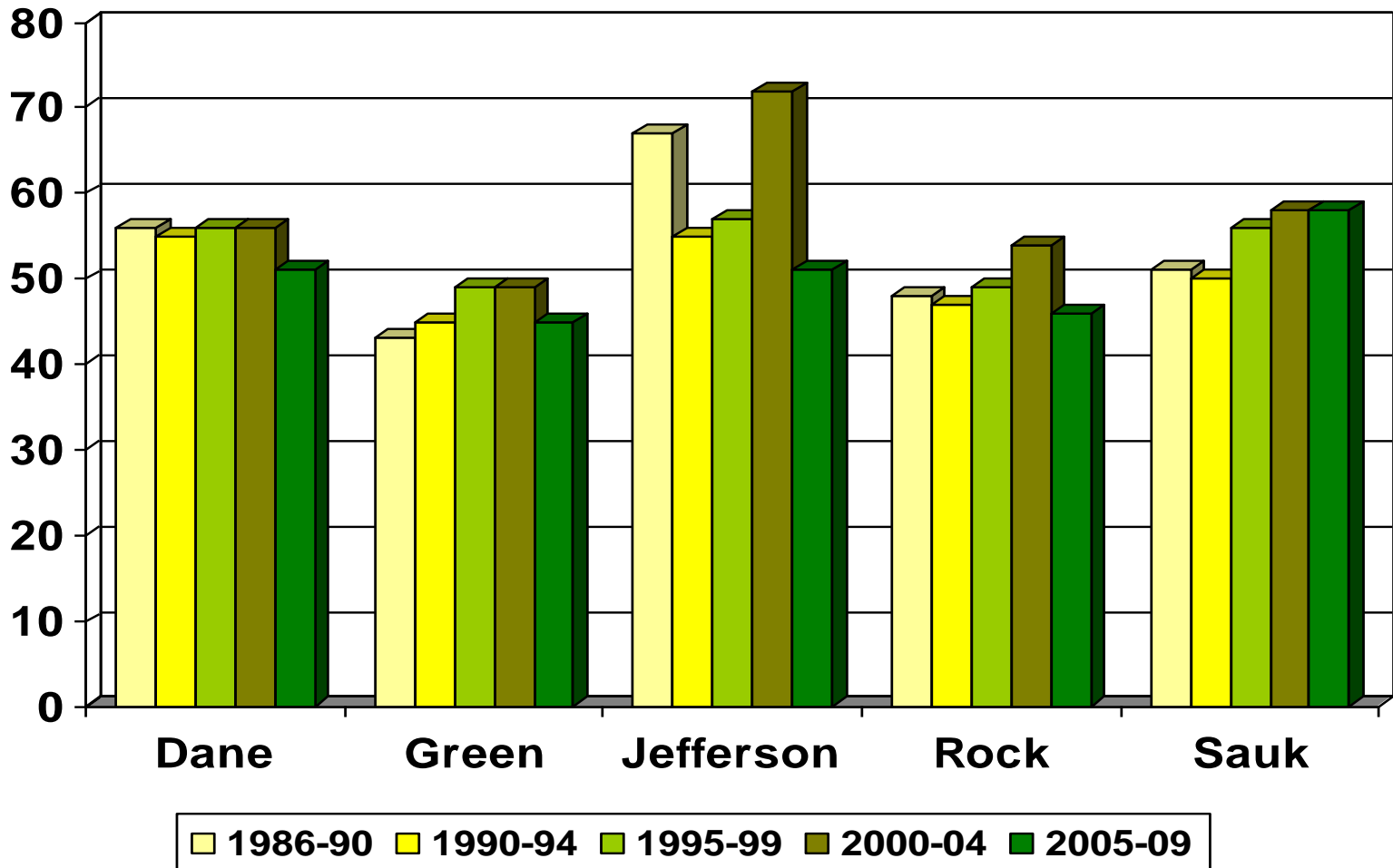
- Spring 247,729 samples
- *March - June*
- Ave. P – 51
- Ave. K – 123
- Ave. pH – 6.56
- Ave. OM – 3.18
- Fall 818,565 samples
- *July - February*
- Ave. P – 51
- Ave. K – 126
- Ave. pH – 6.67
- Ave. OM – 3.40

# Summary

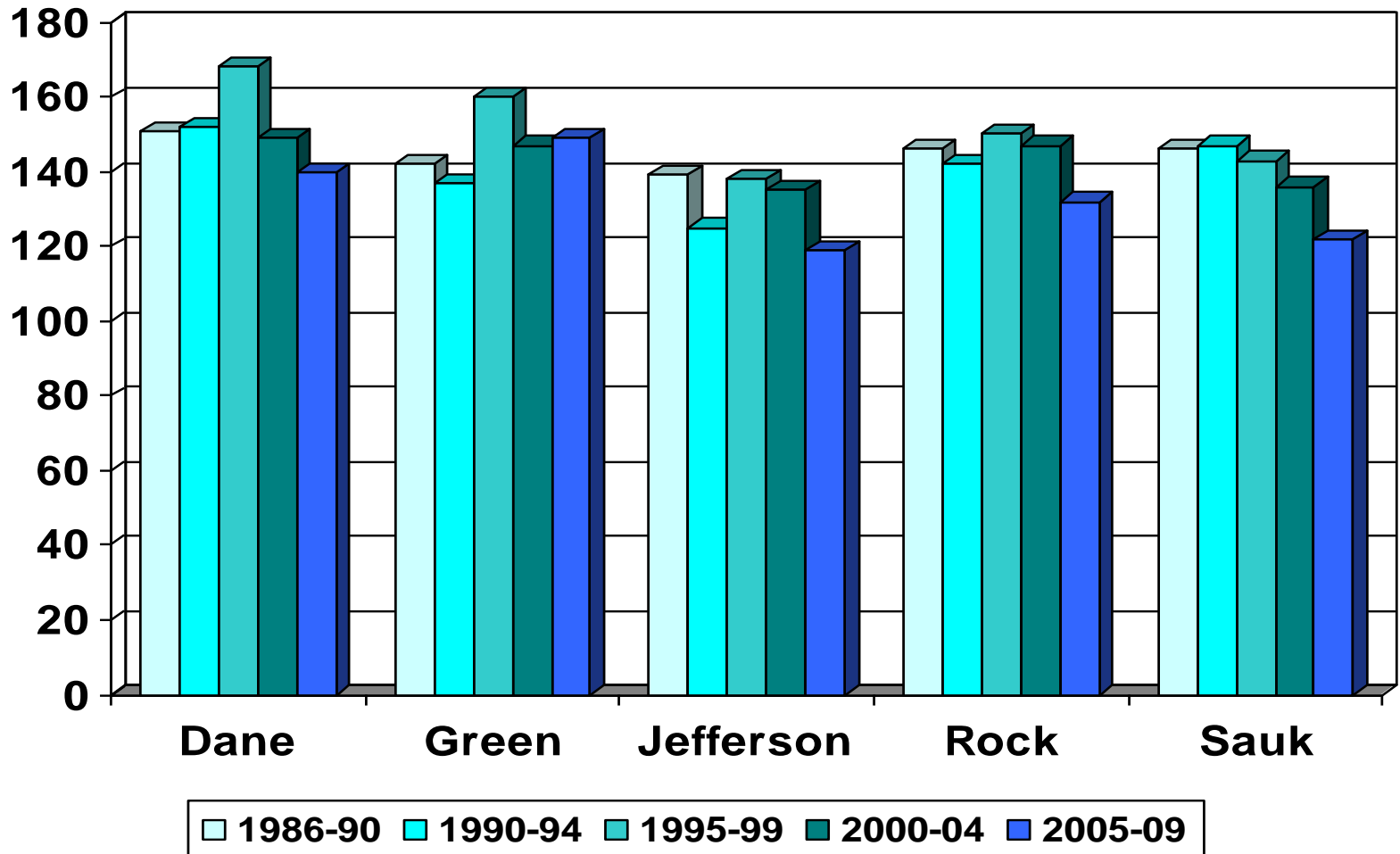
- Soil test P and K trends indicate improved nutrient management practices are being implemented on more acres.
- Soil test P and K levels are decreasing in many counties, although in many cases these remain above the optimum level.



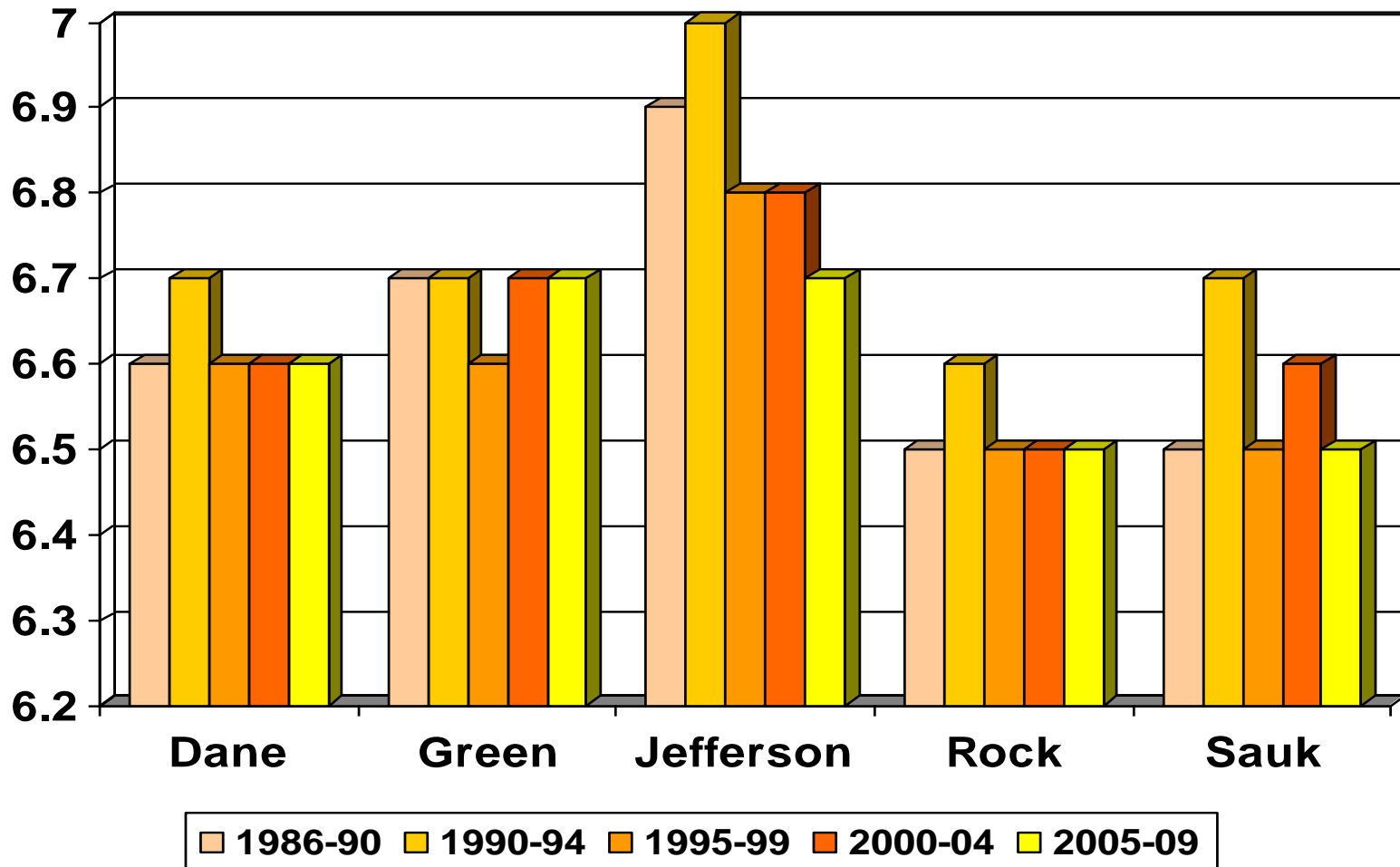
# Regional Phosphorus Averages



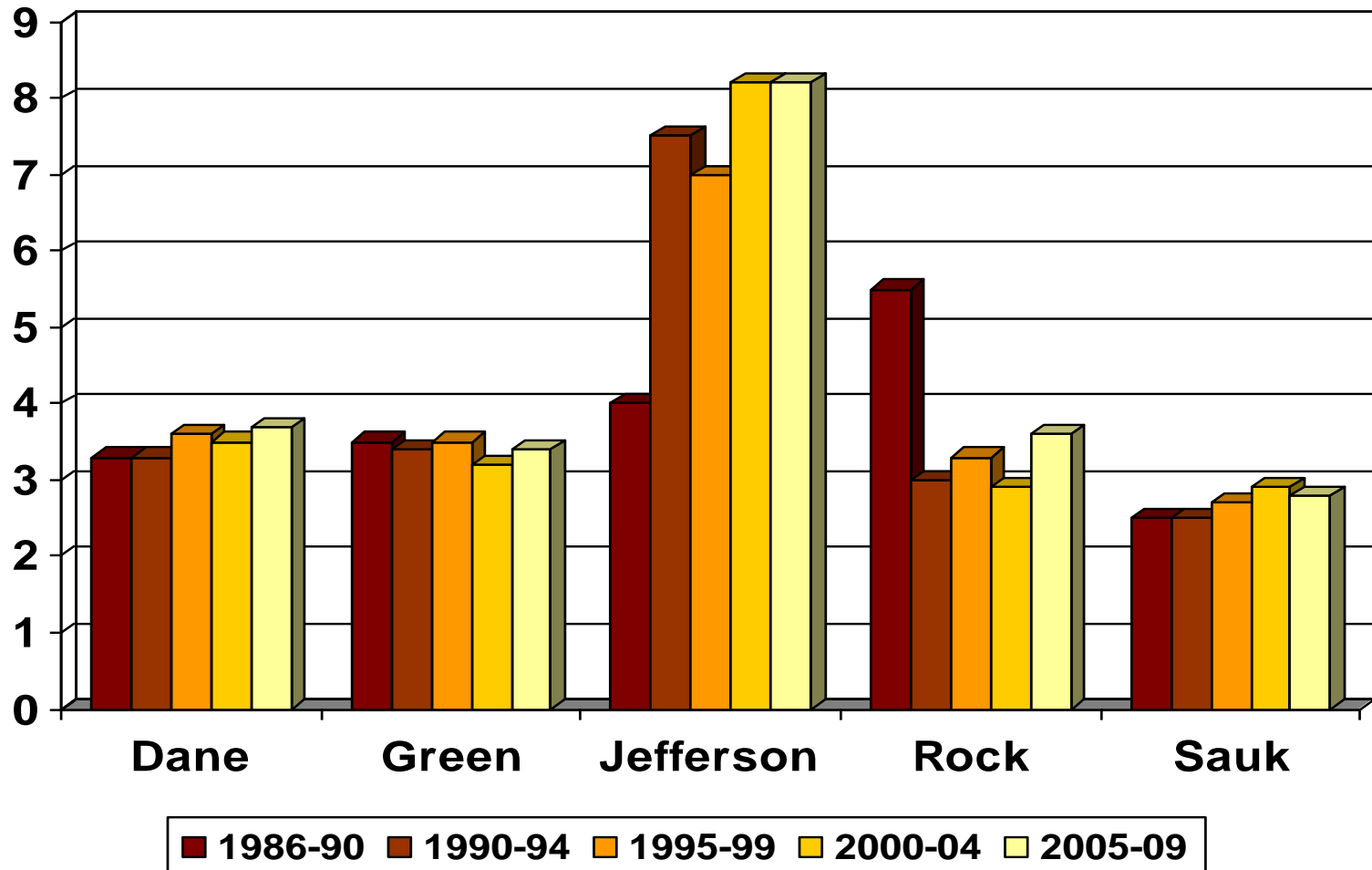
# Regional Potassium Averages



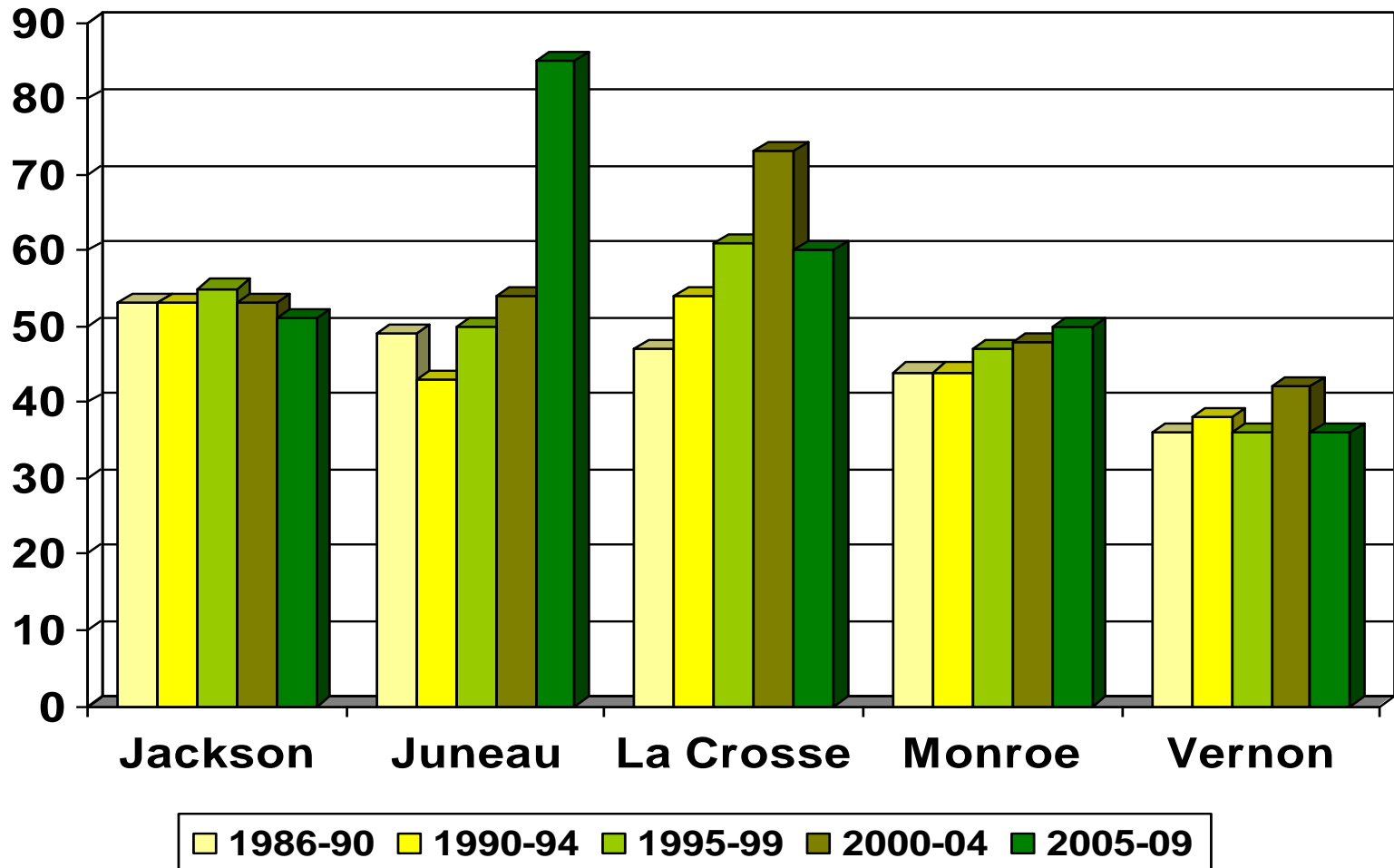
# Regional pH Averages



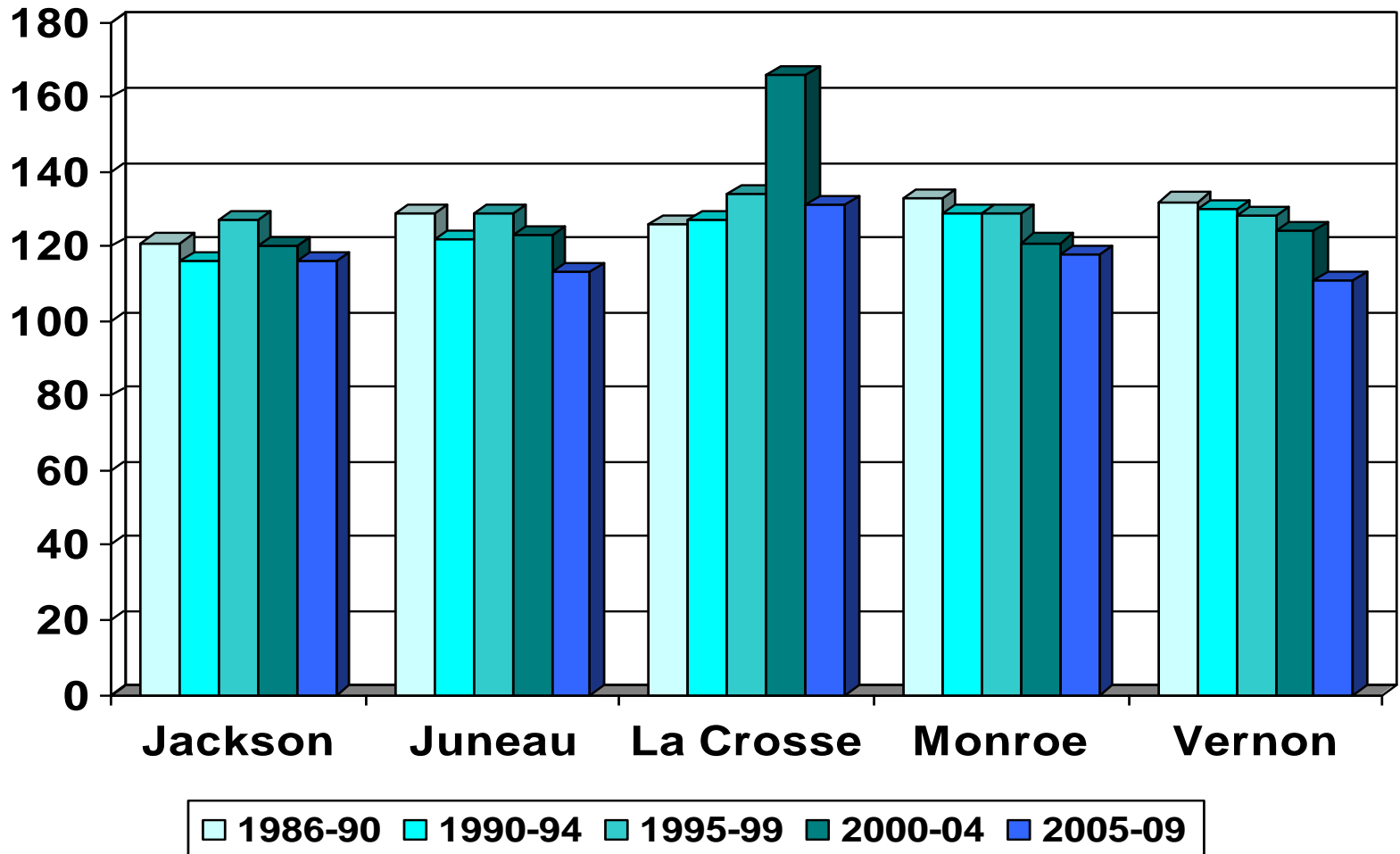
# Regional Organic Matter % Averages



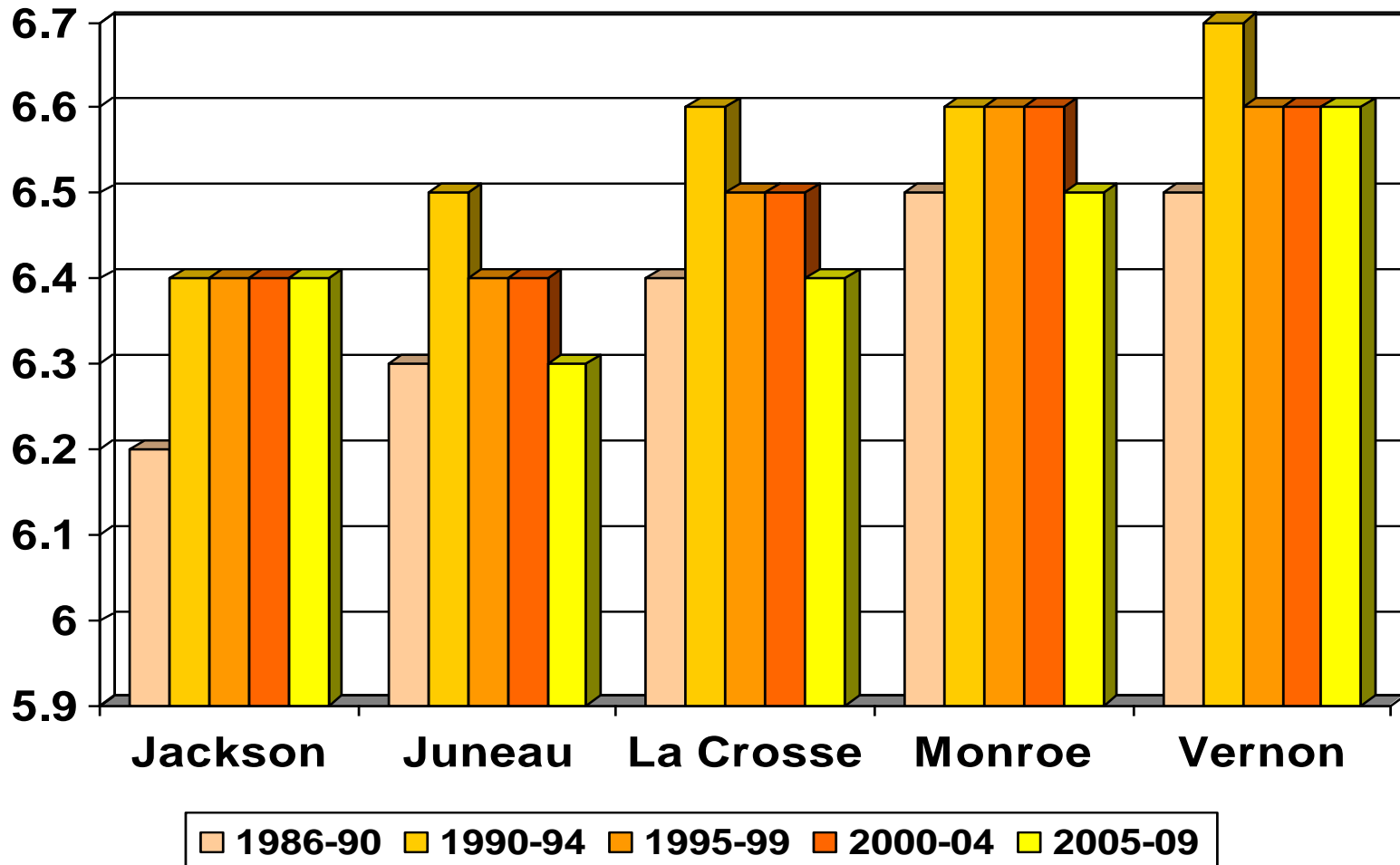
# Regional Phosphorus Averages



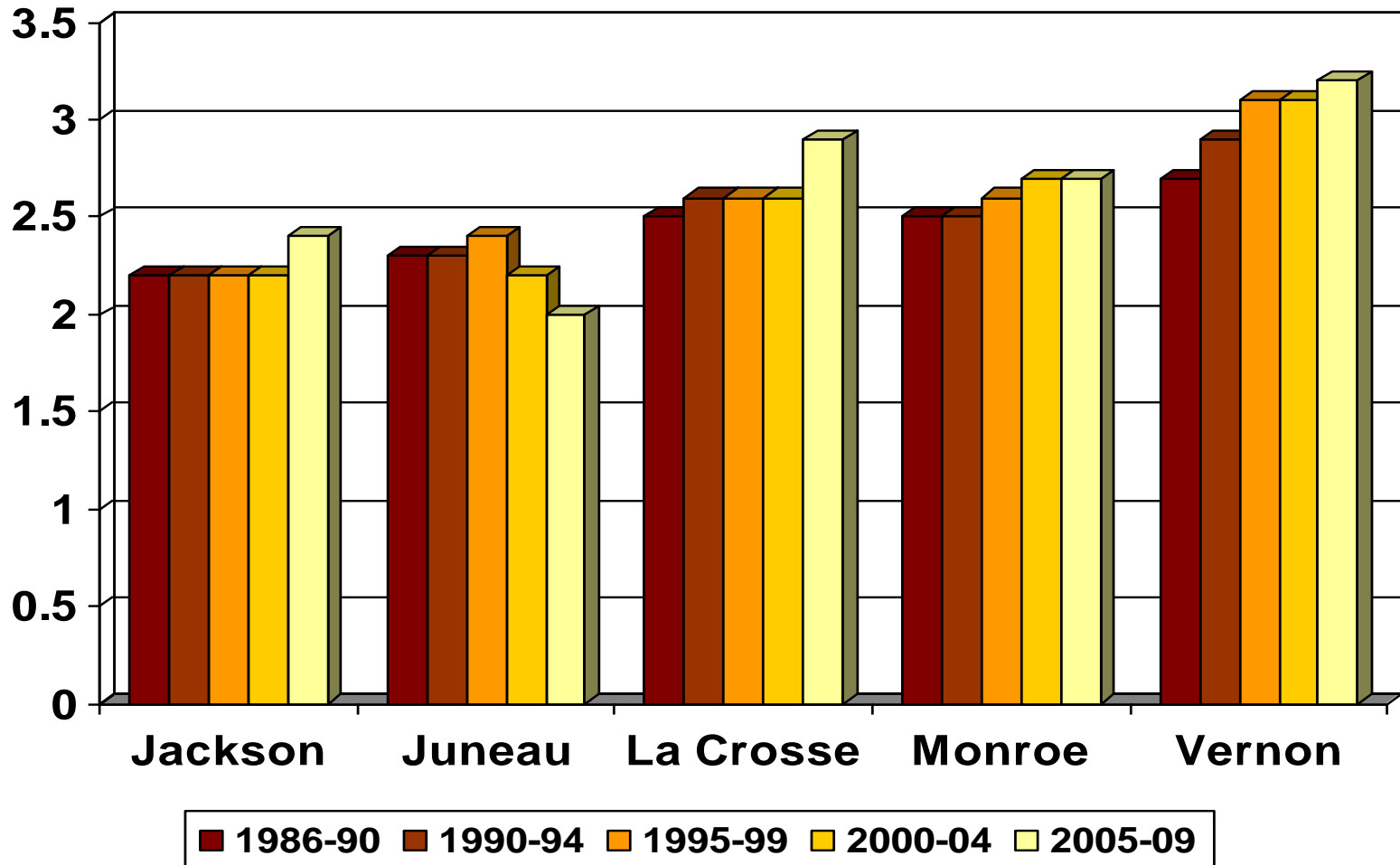
# Regional Potassium Averages



# Regional pH Averages

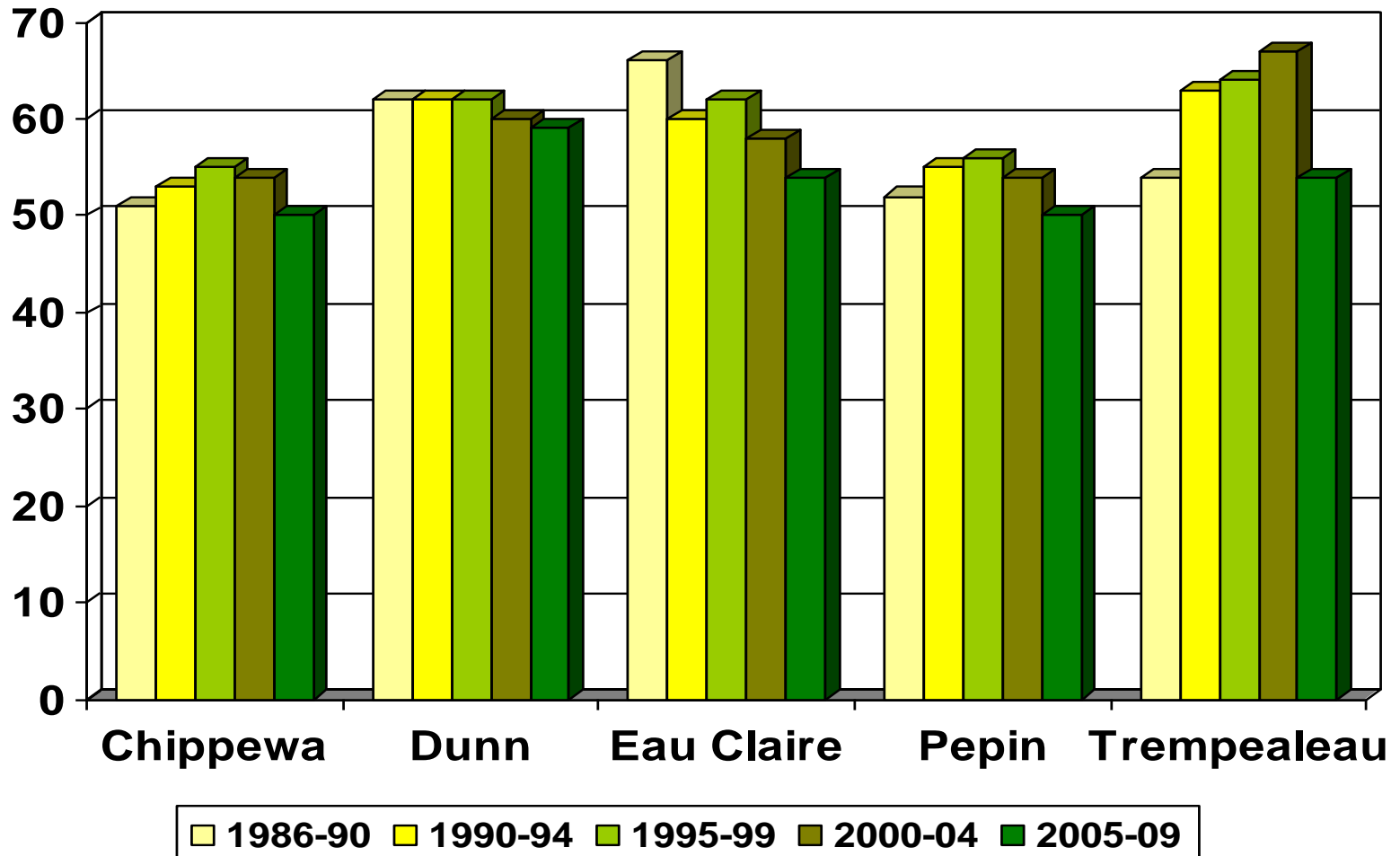


# Regional Organic Matter % Averages

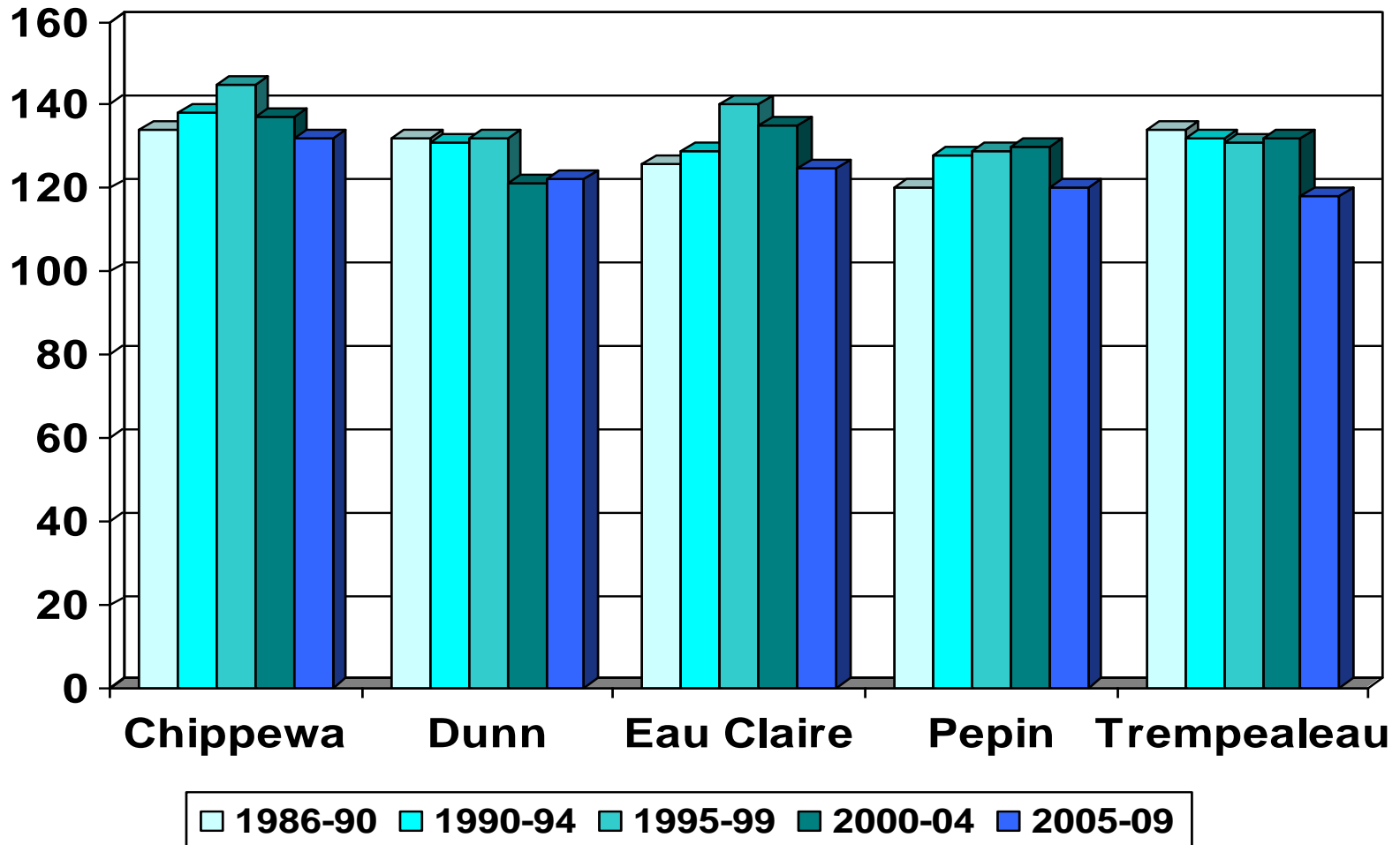




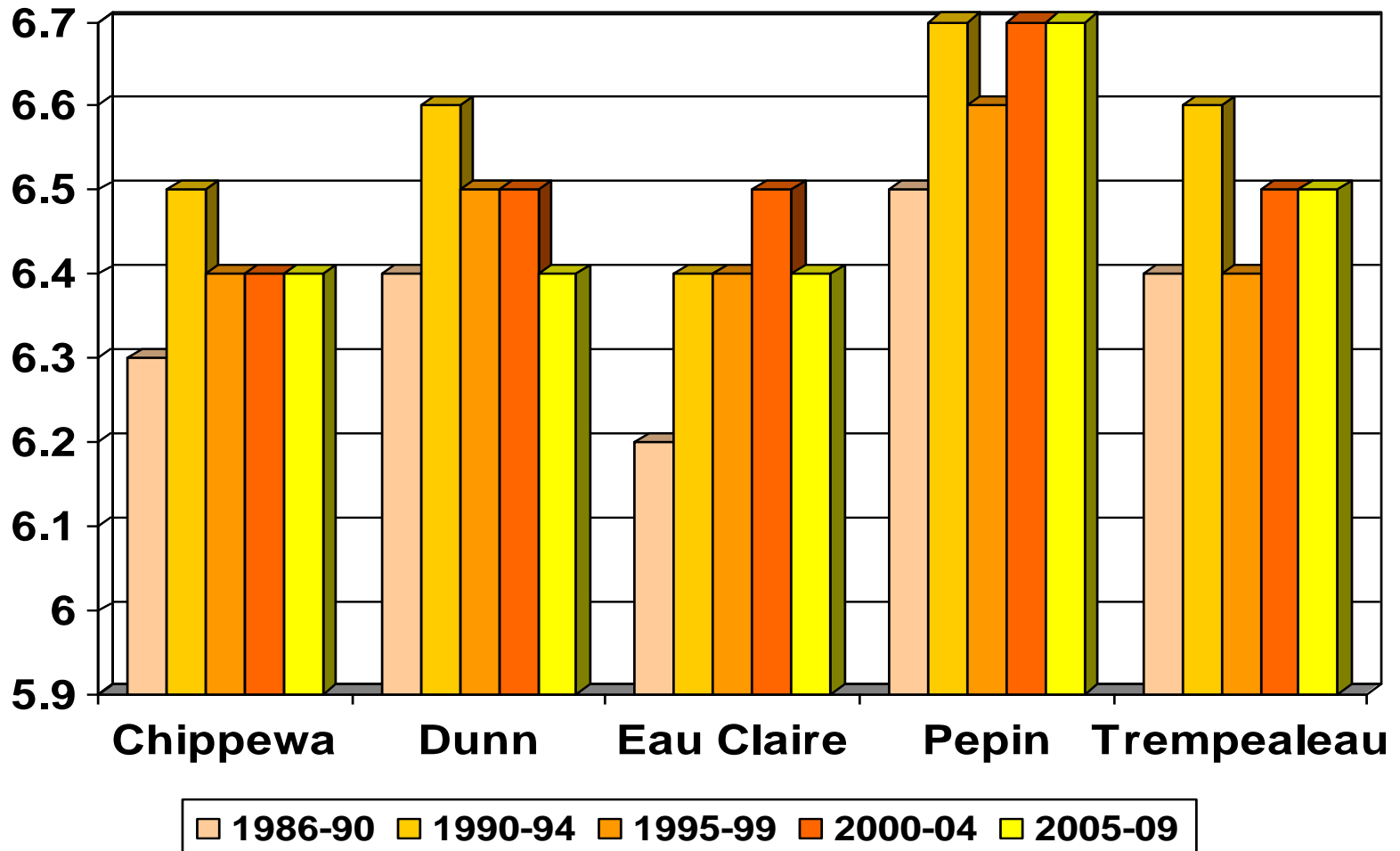
# Regional Phosphorus Averages



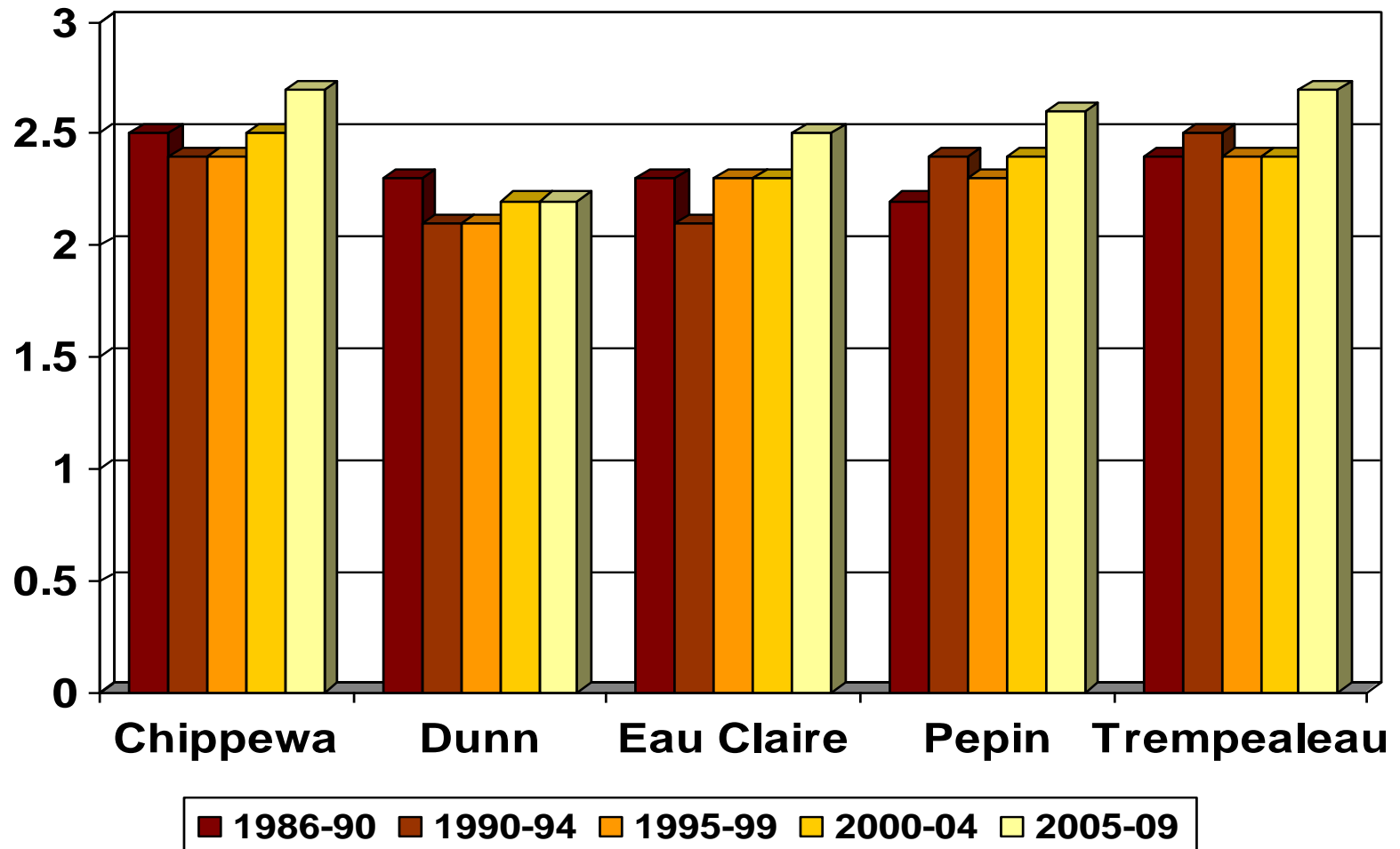
# Regional Potassium Averages



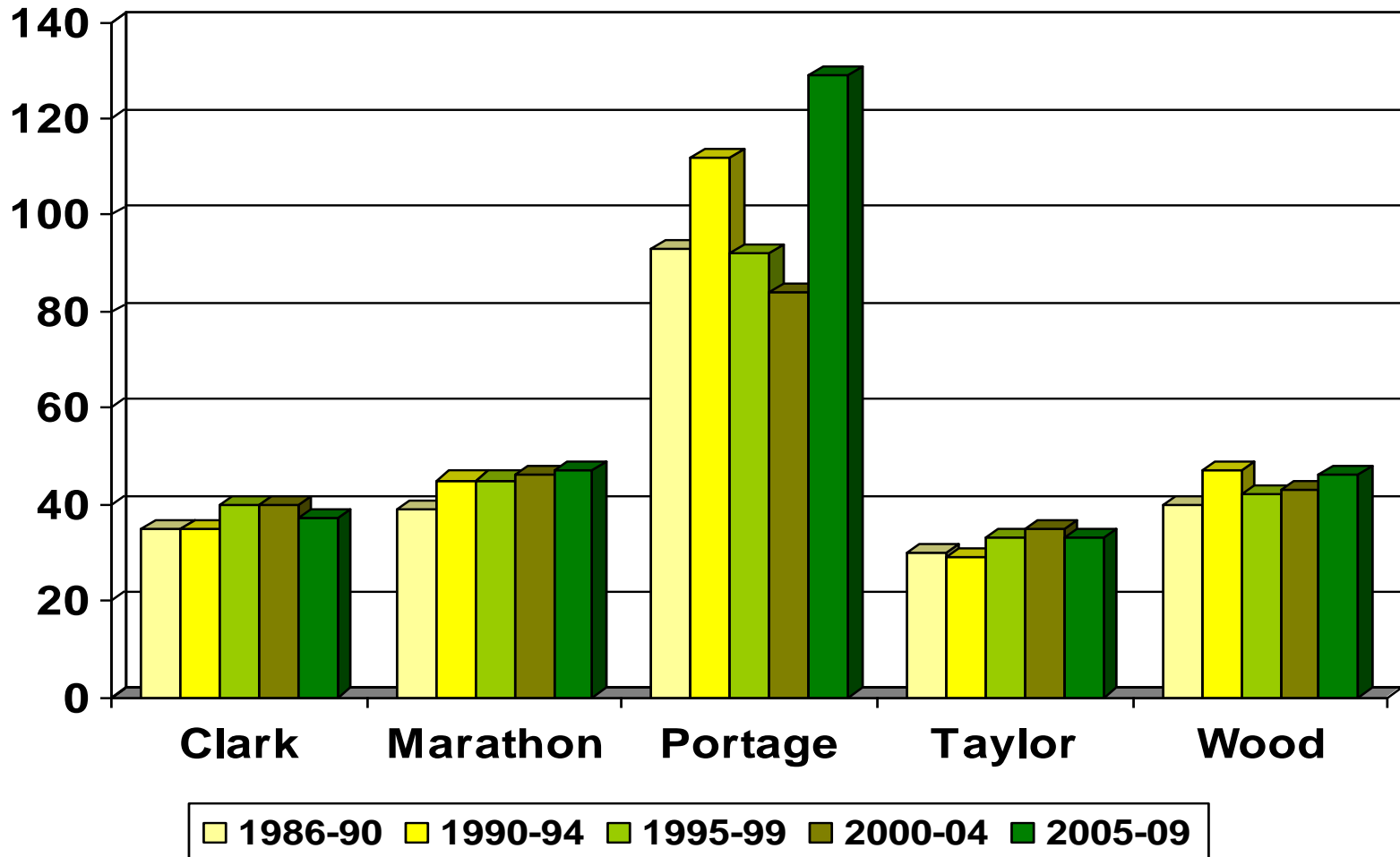
# Regional pH Averages



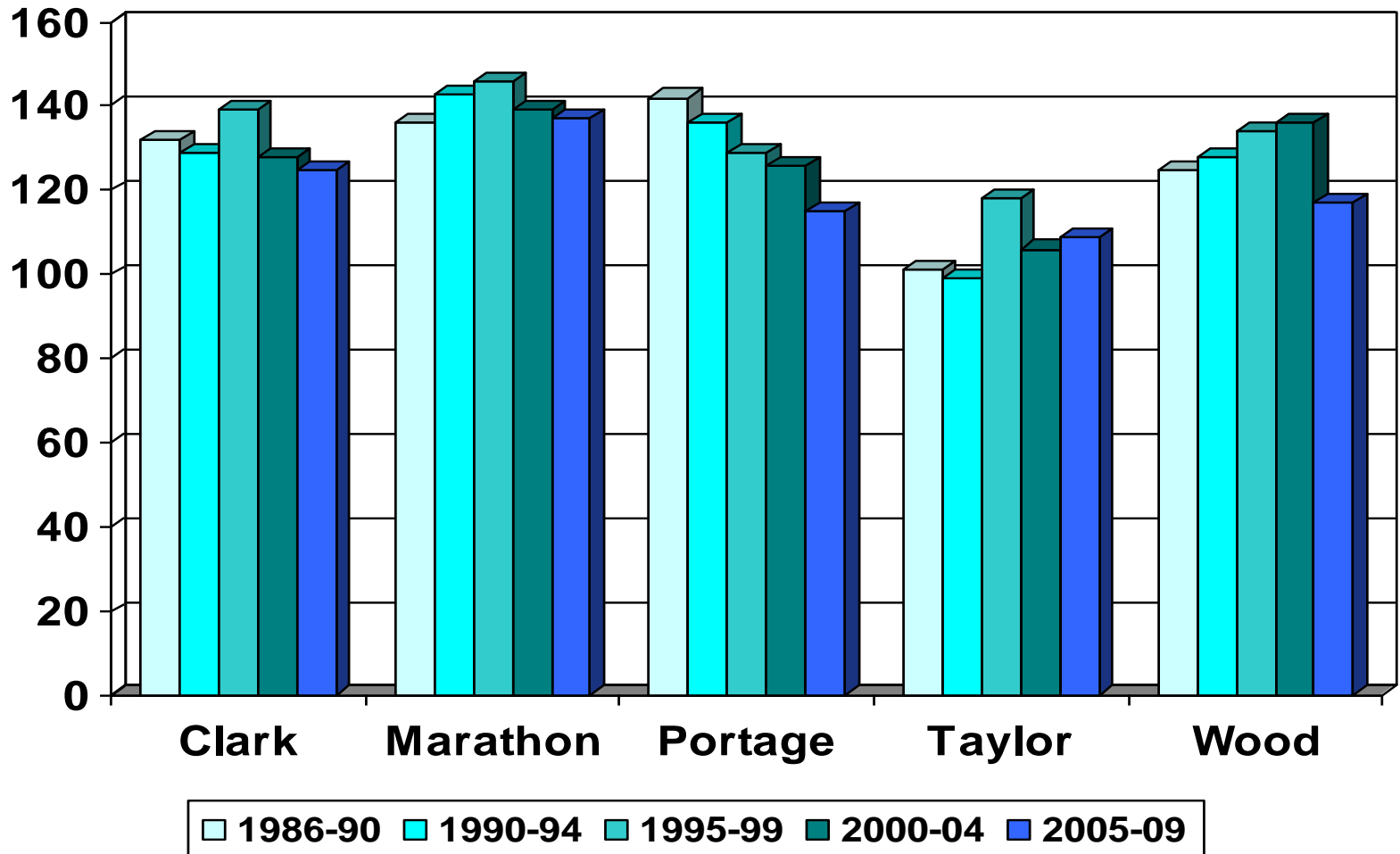
# Regional Organic Matter % Averages



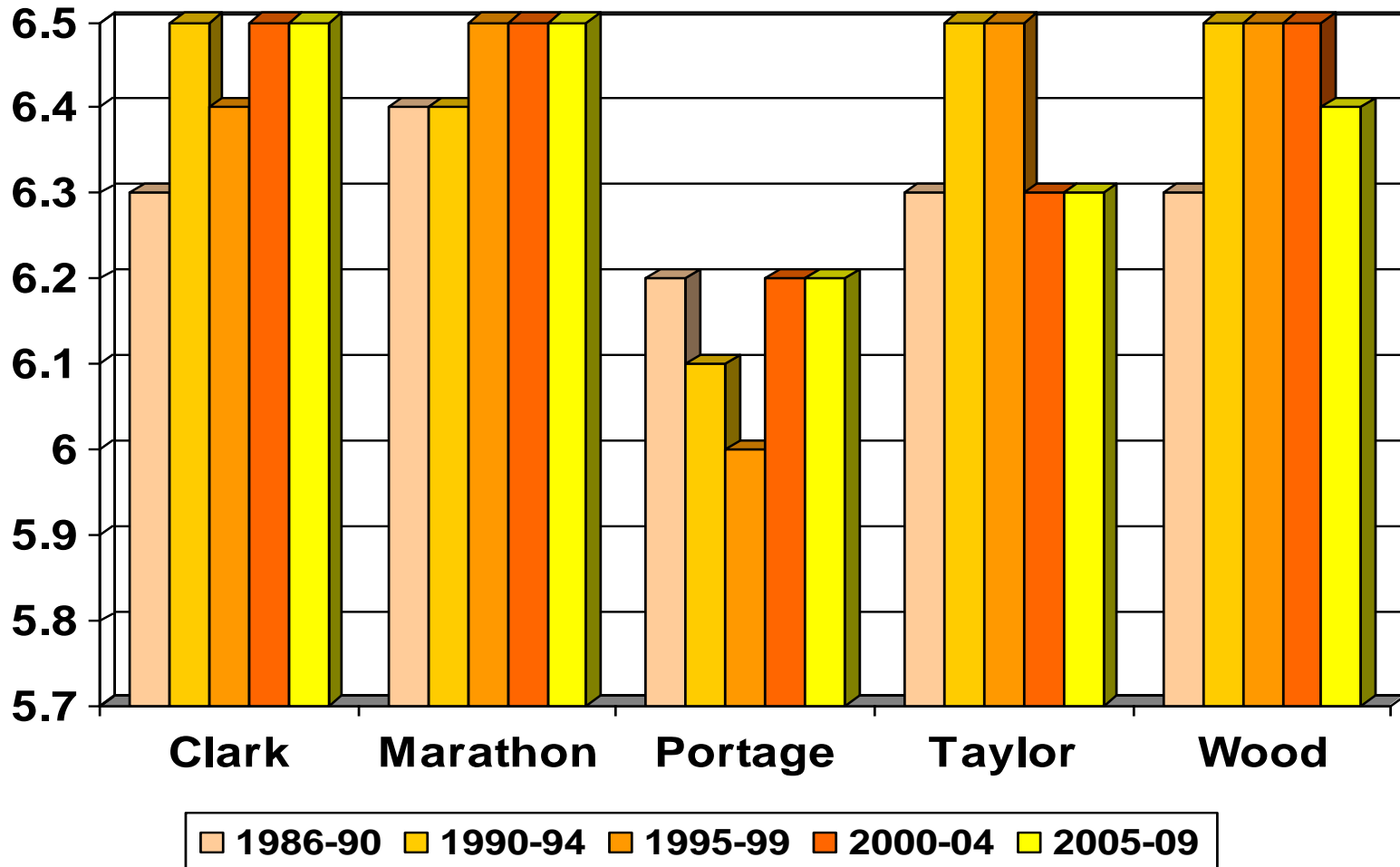
# Regional Phosphorus Averages



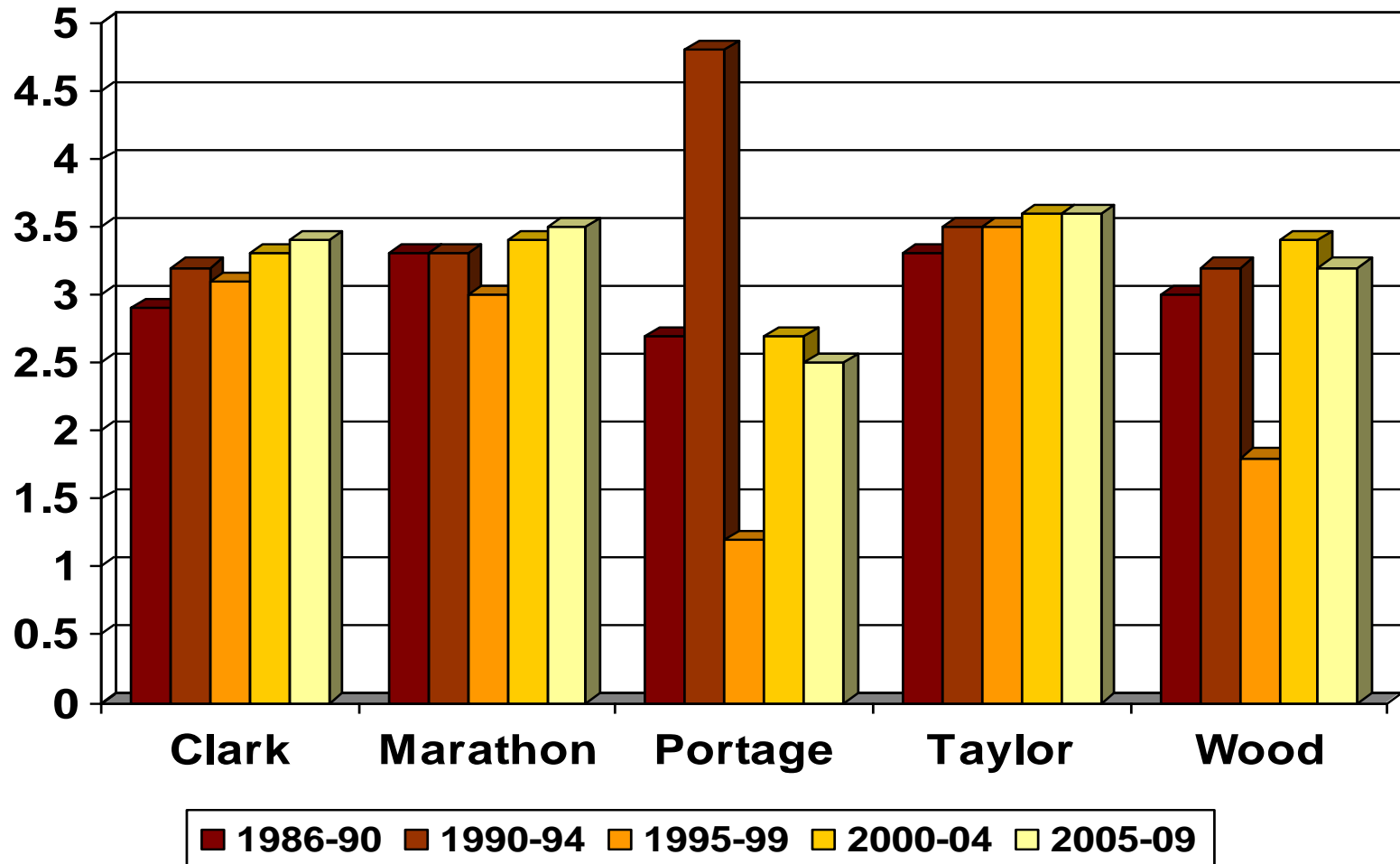
# Regional Potassium Averages



# Regional pH Averages

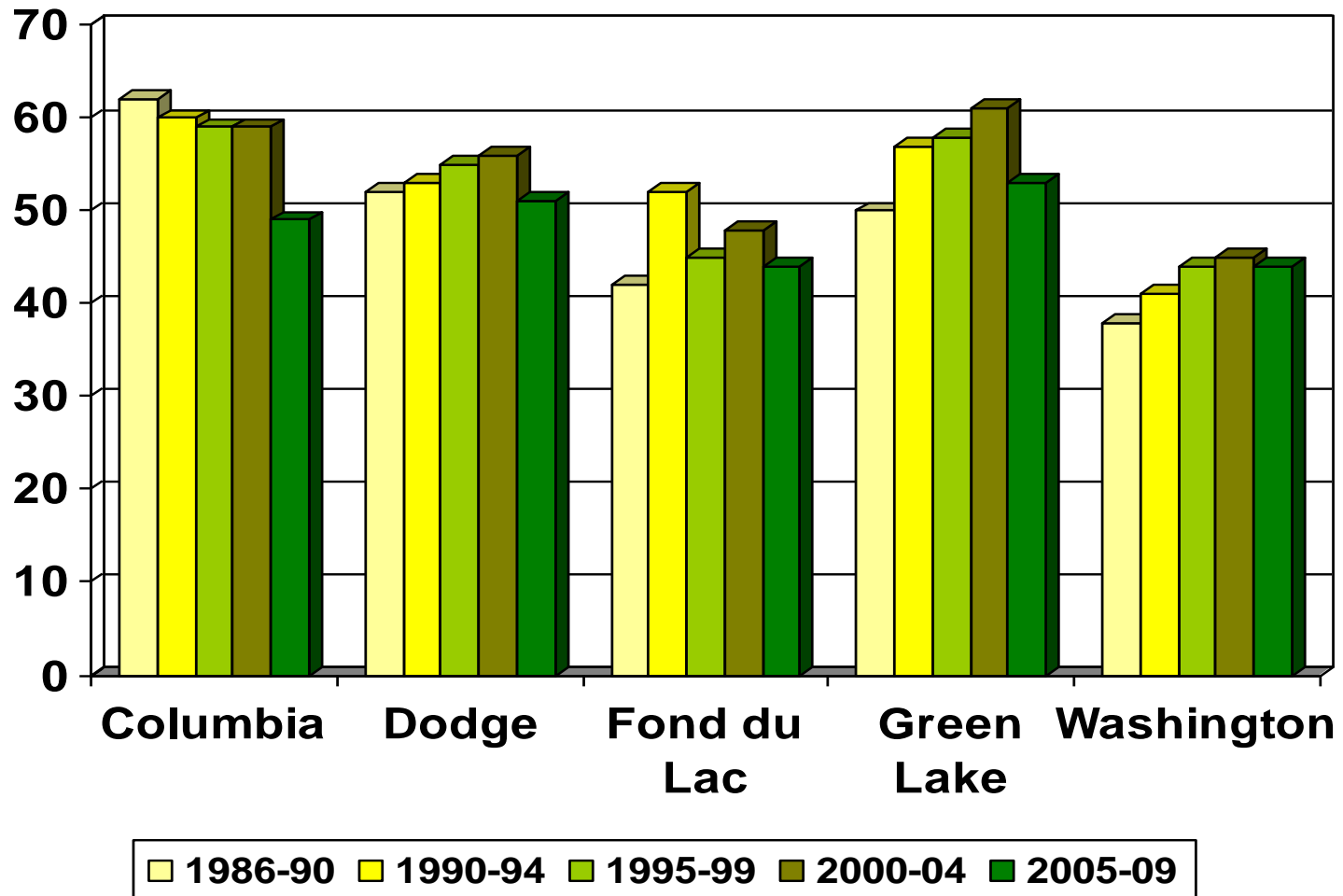


# Regional Organic Matter % Averages

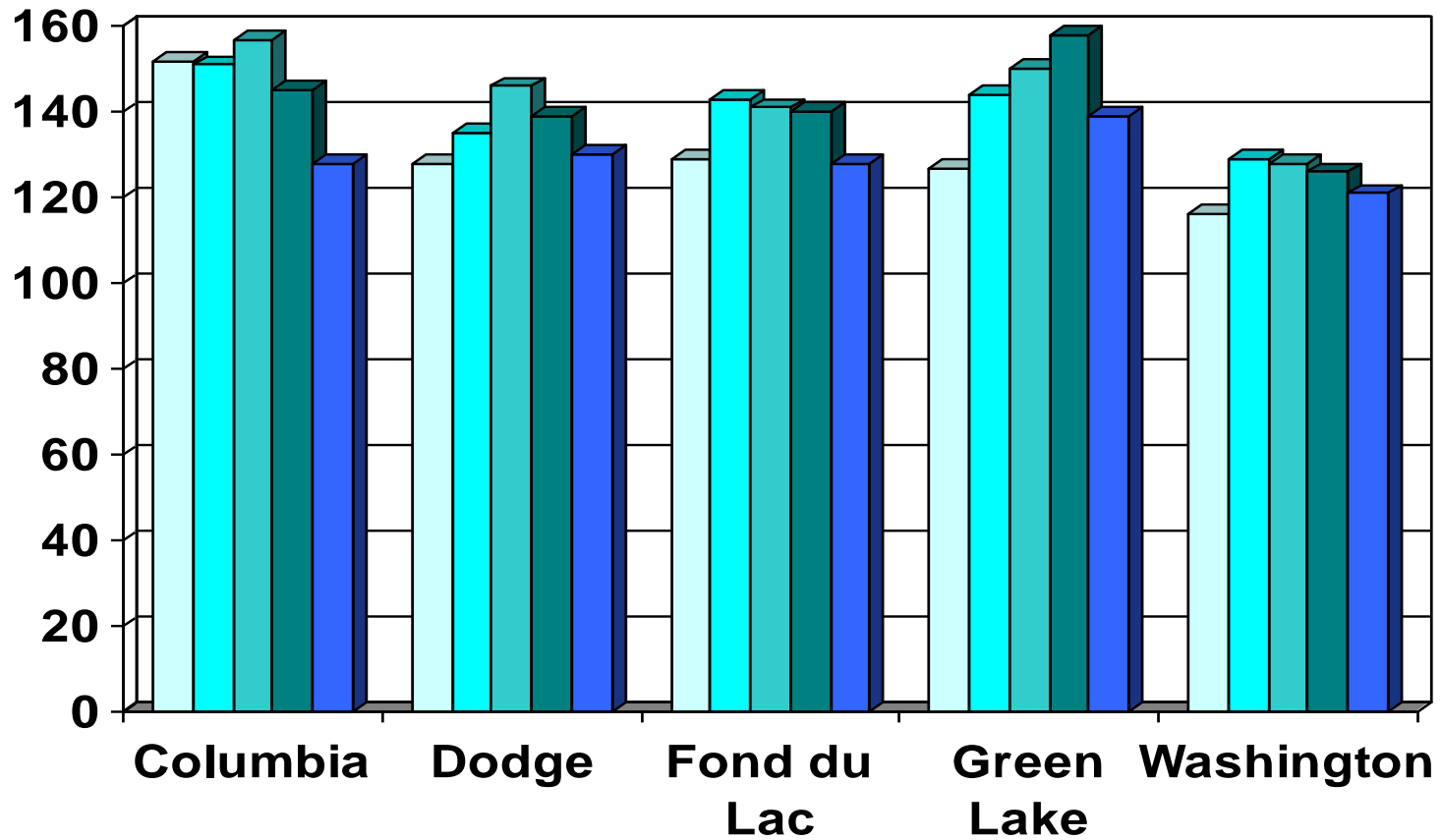




# Regional Phosphorus Averages

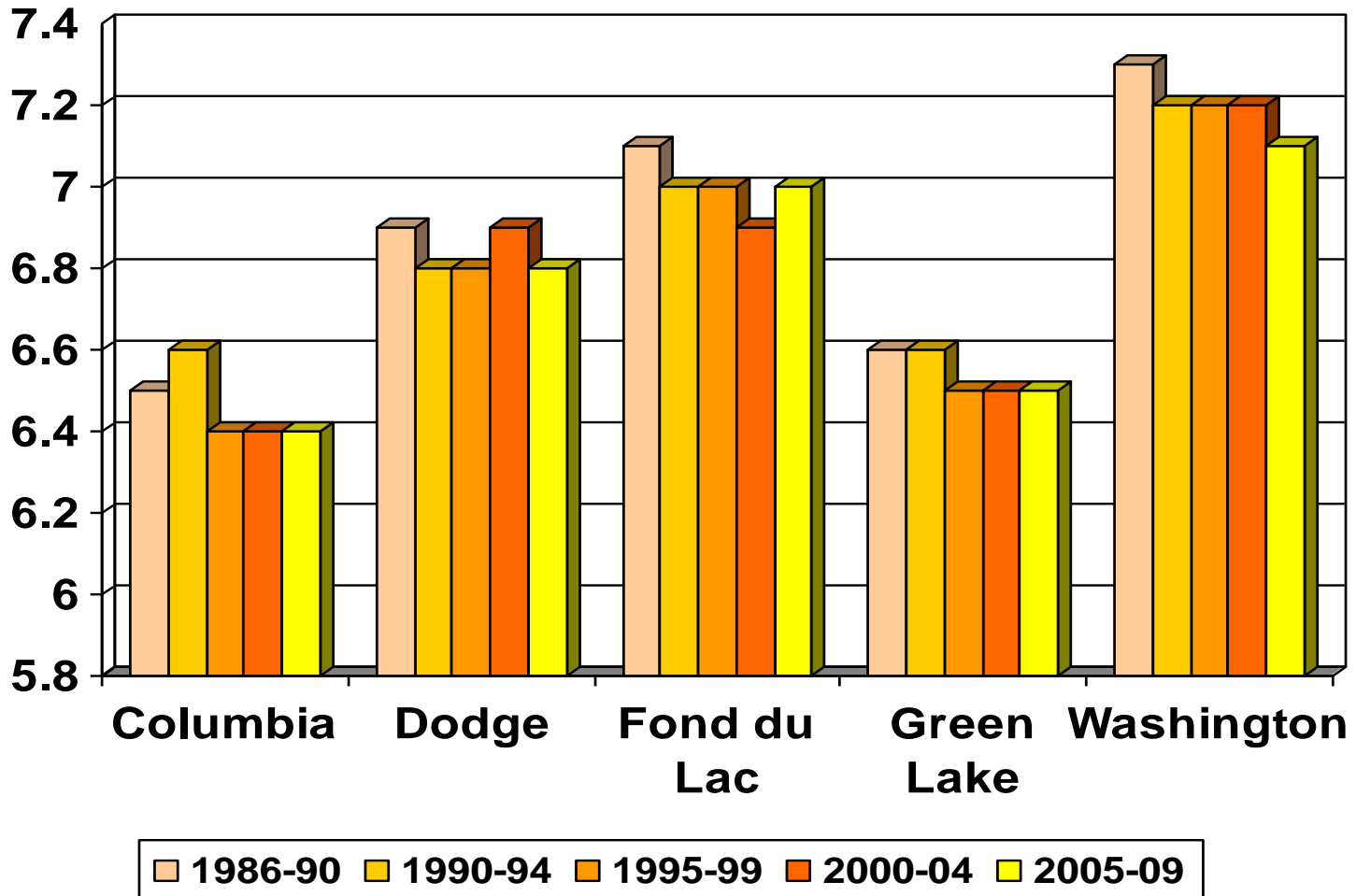


# Regional Potassium Averages

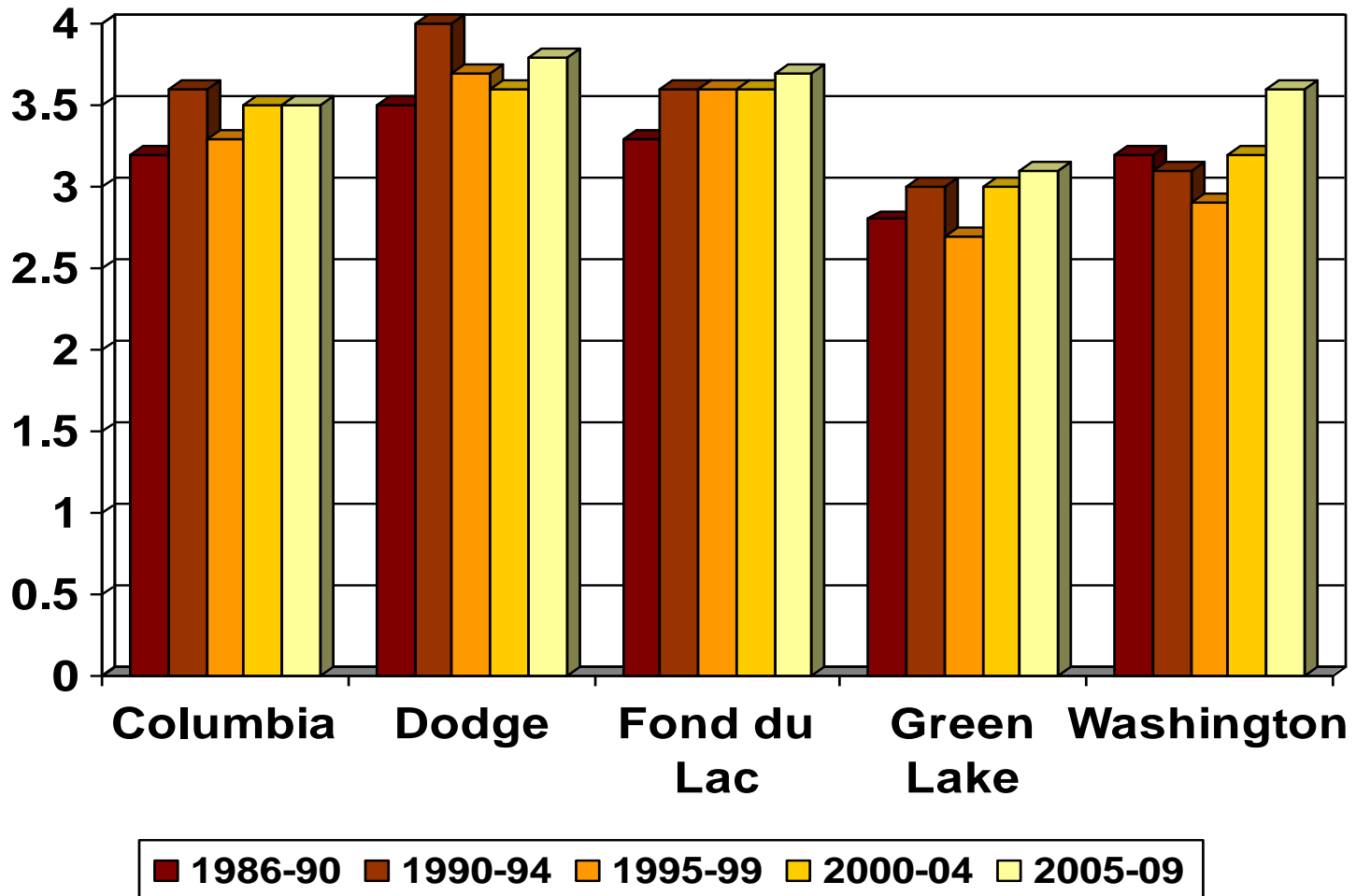


1986-90 1990-94 1995-99 2000-04 2005-09

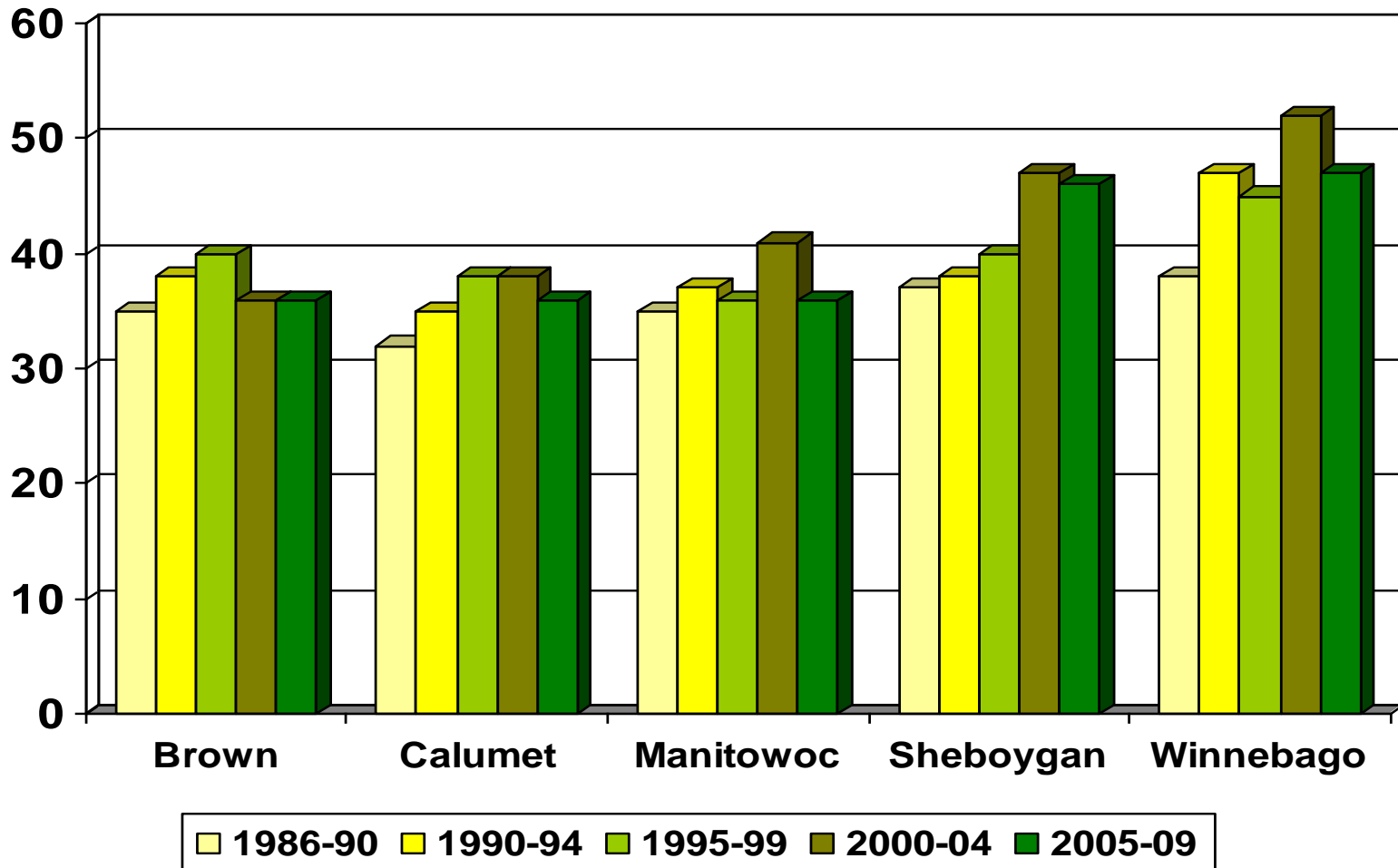
# Regional pH Averages



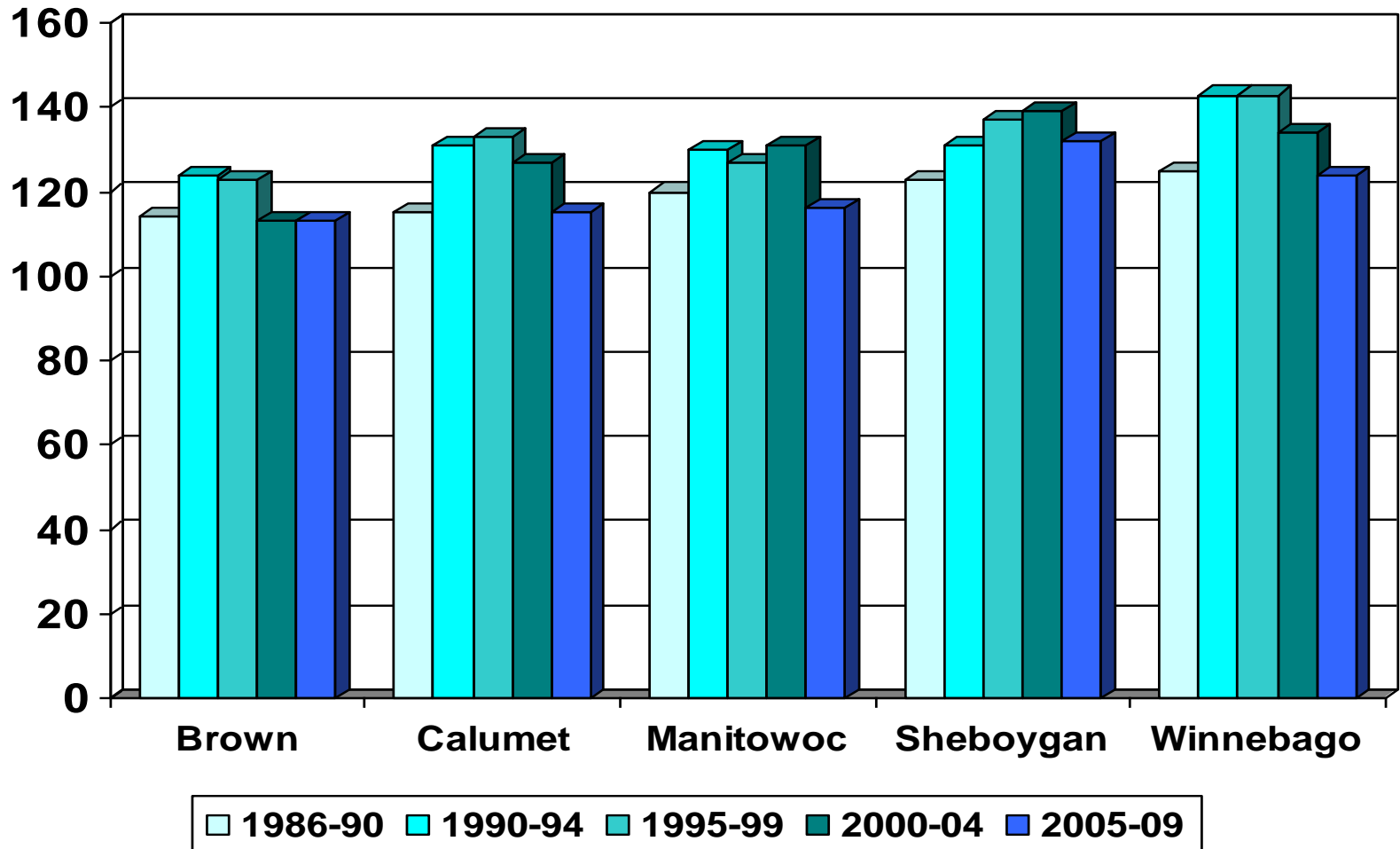
# Regional Organic Matter % Averages



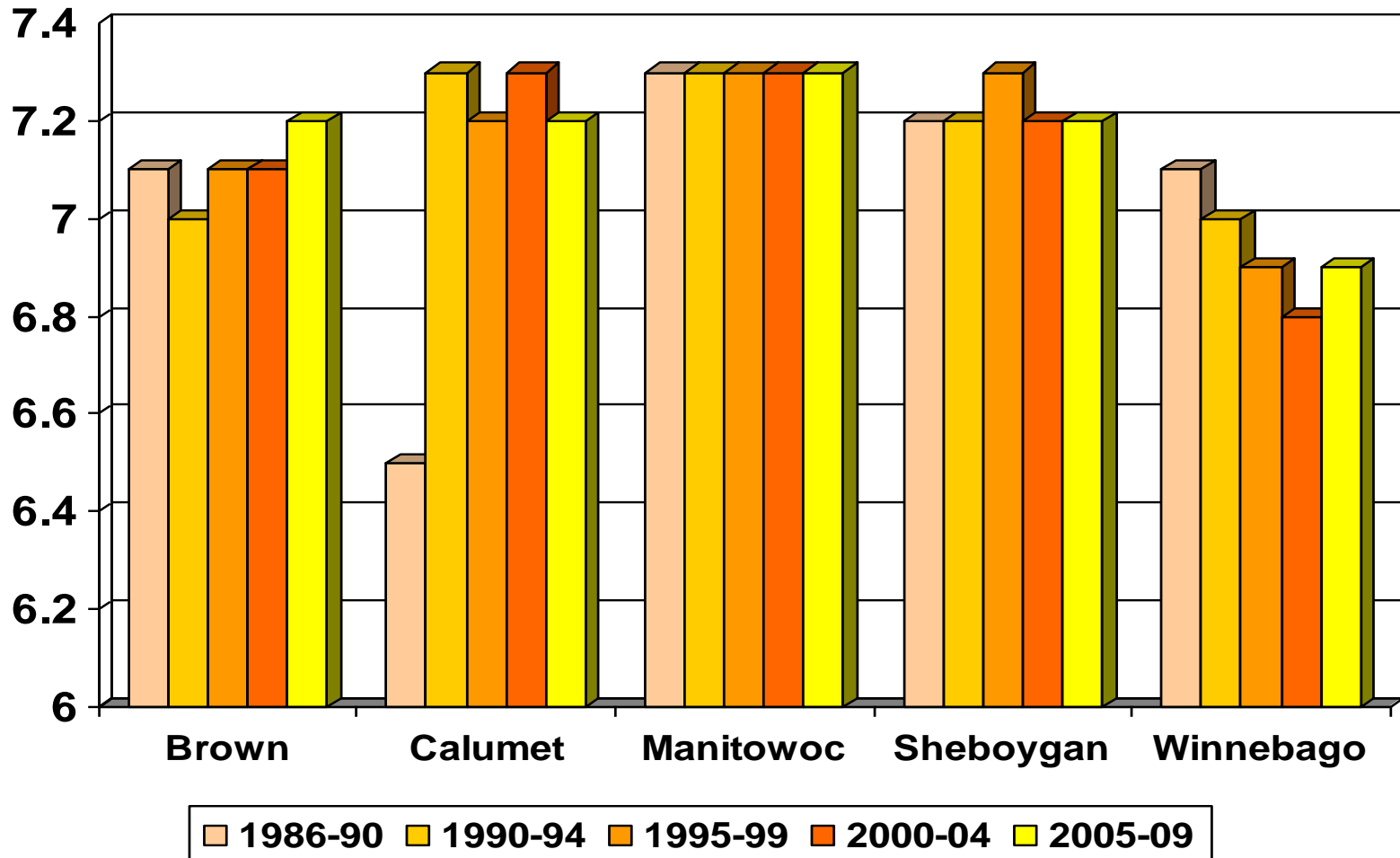
# Regional Phosphorus Averages



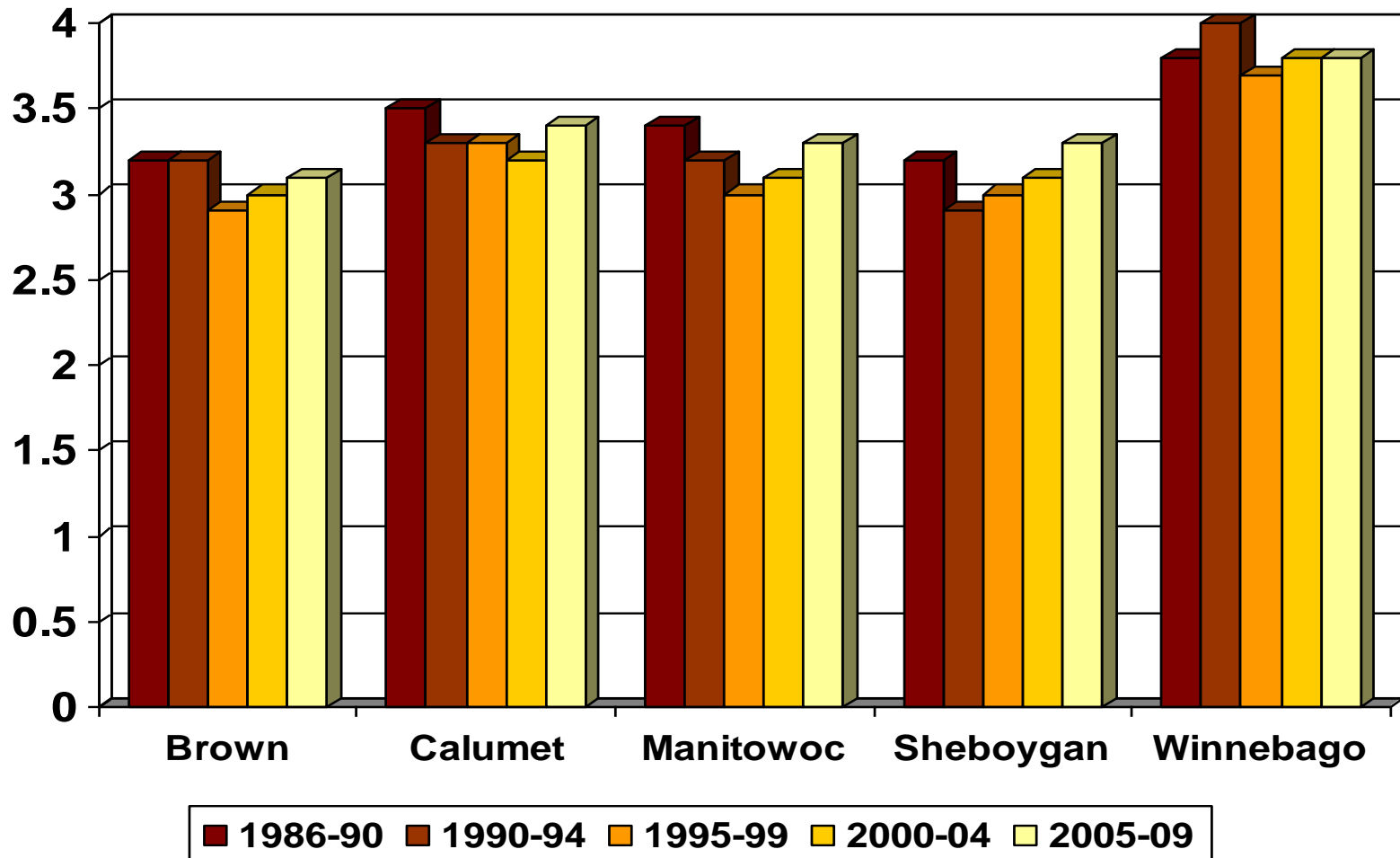
# Regional Potassium Averages



# Regional pH Averages

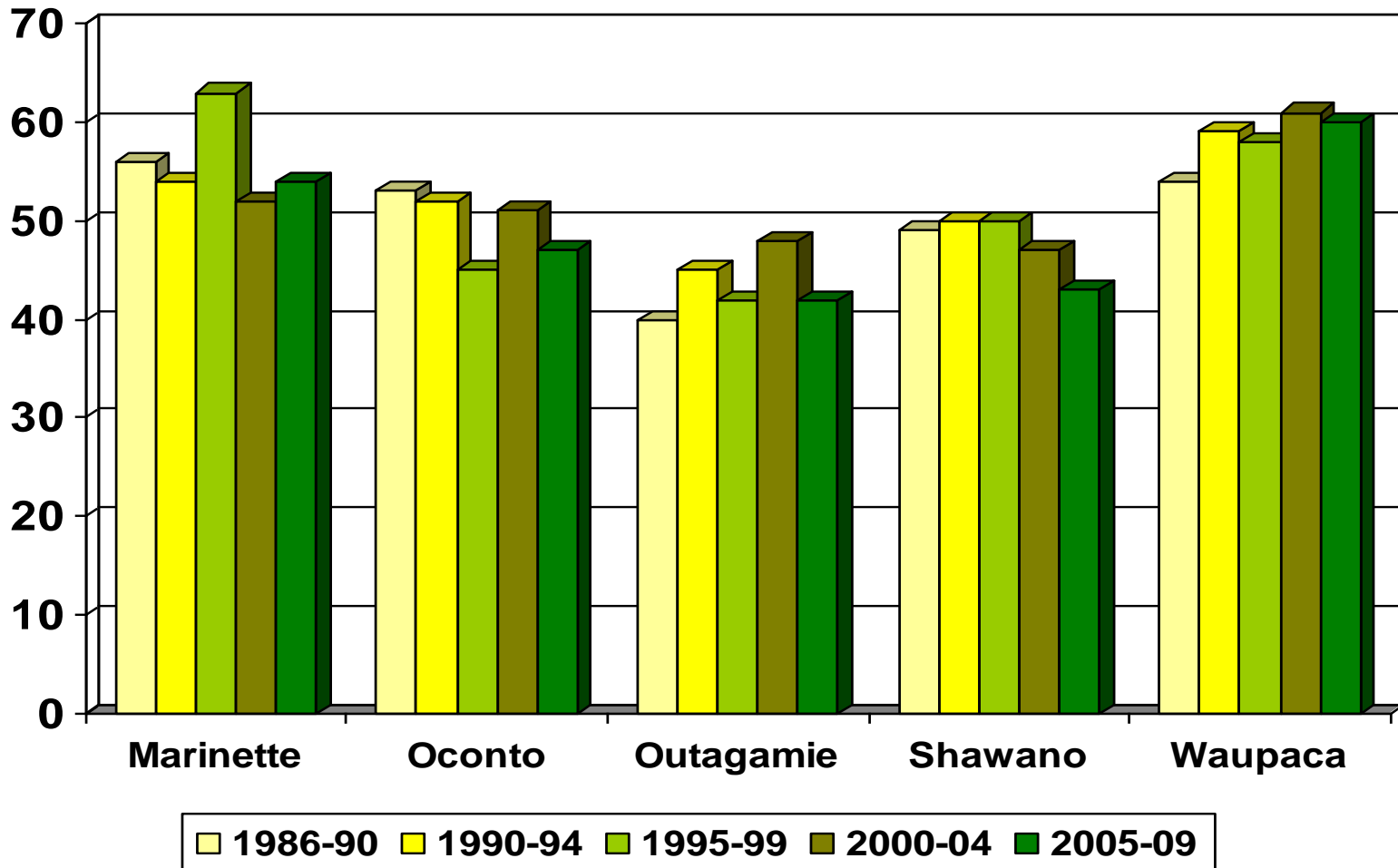


# Regional Organic Matter % Averages

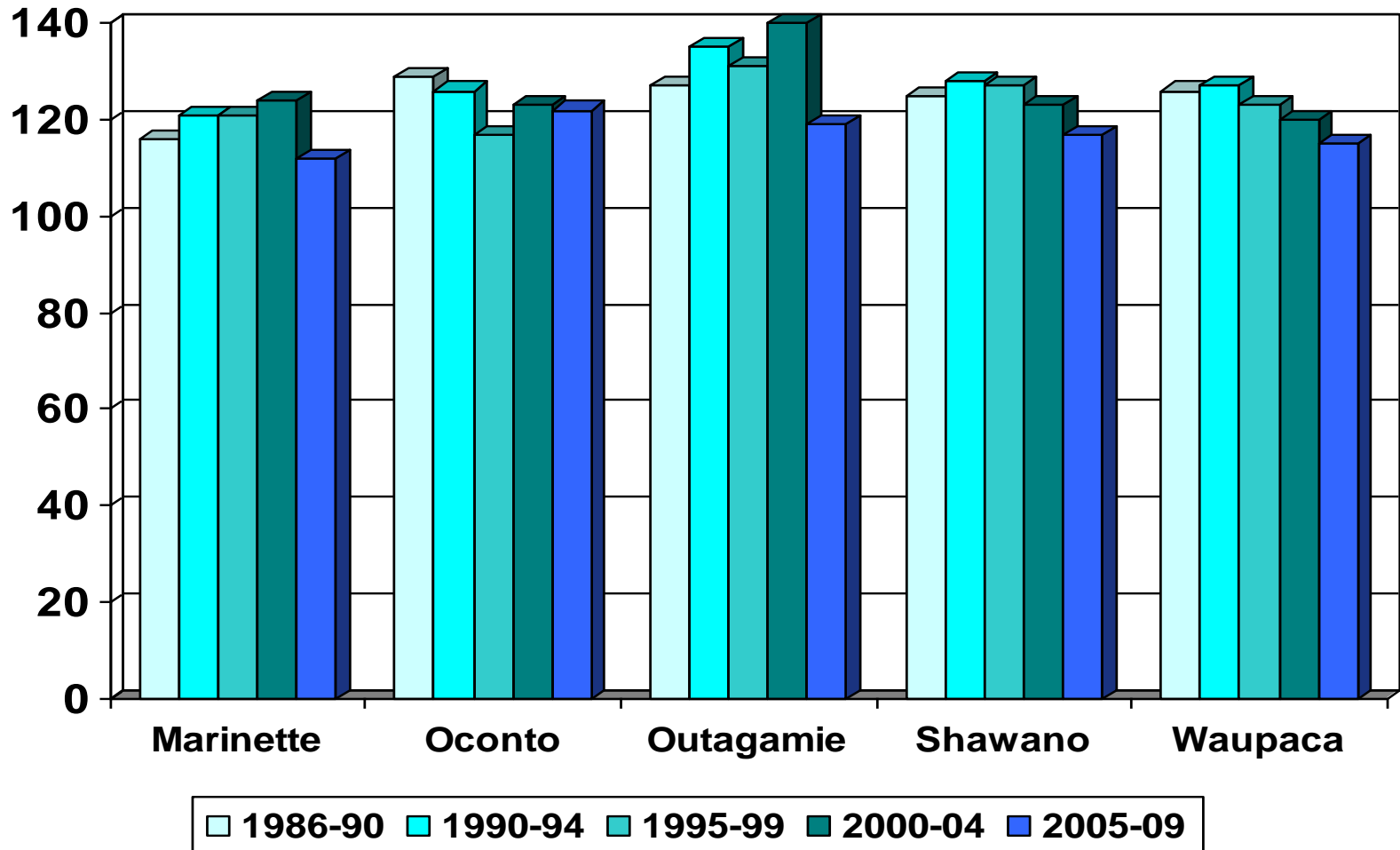




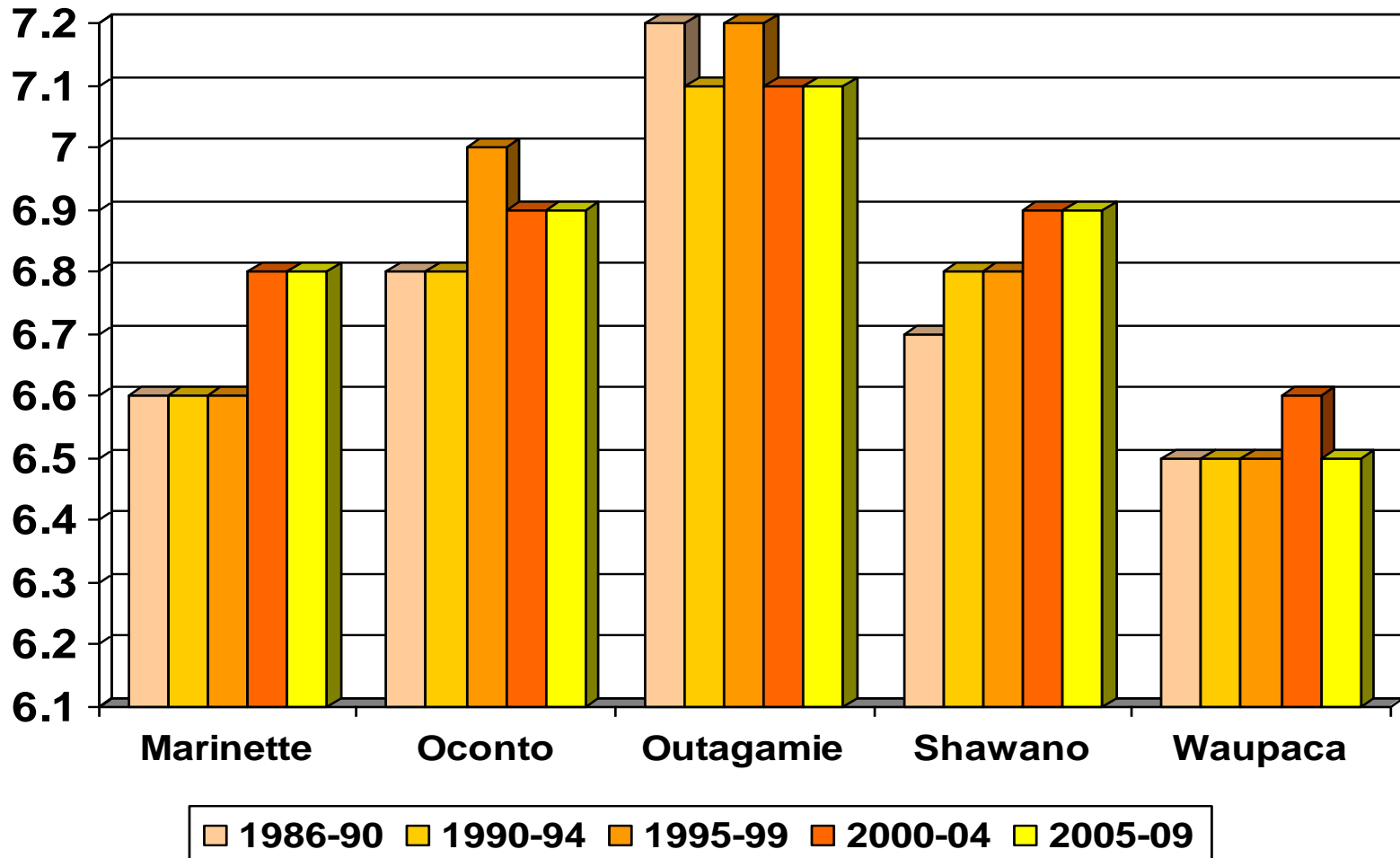
# Regional Phosphorus Averages



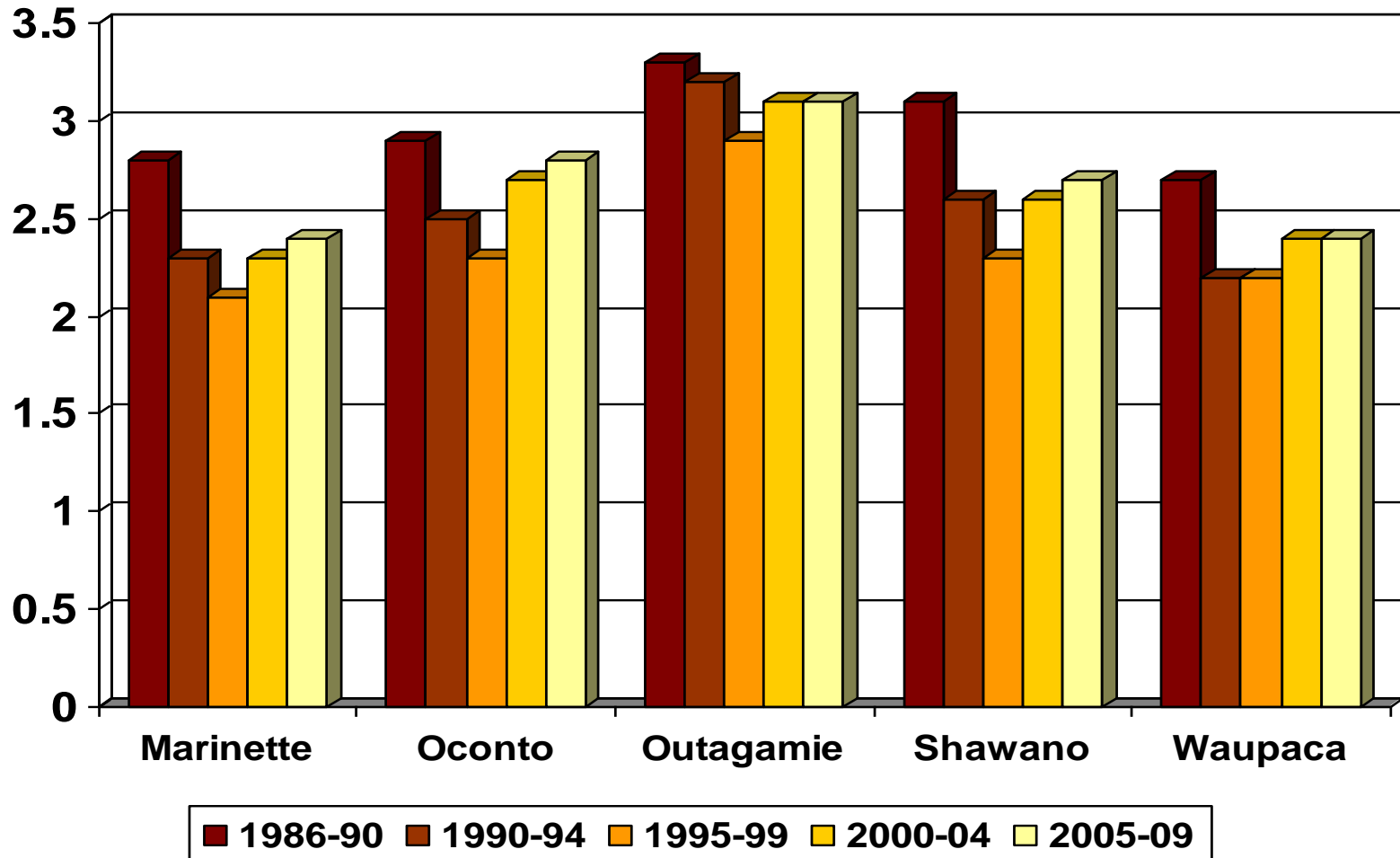
# Regional Potassium Averages



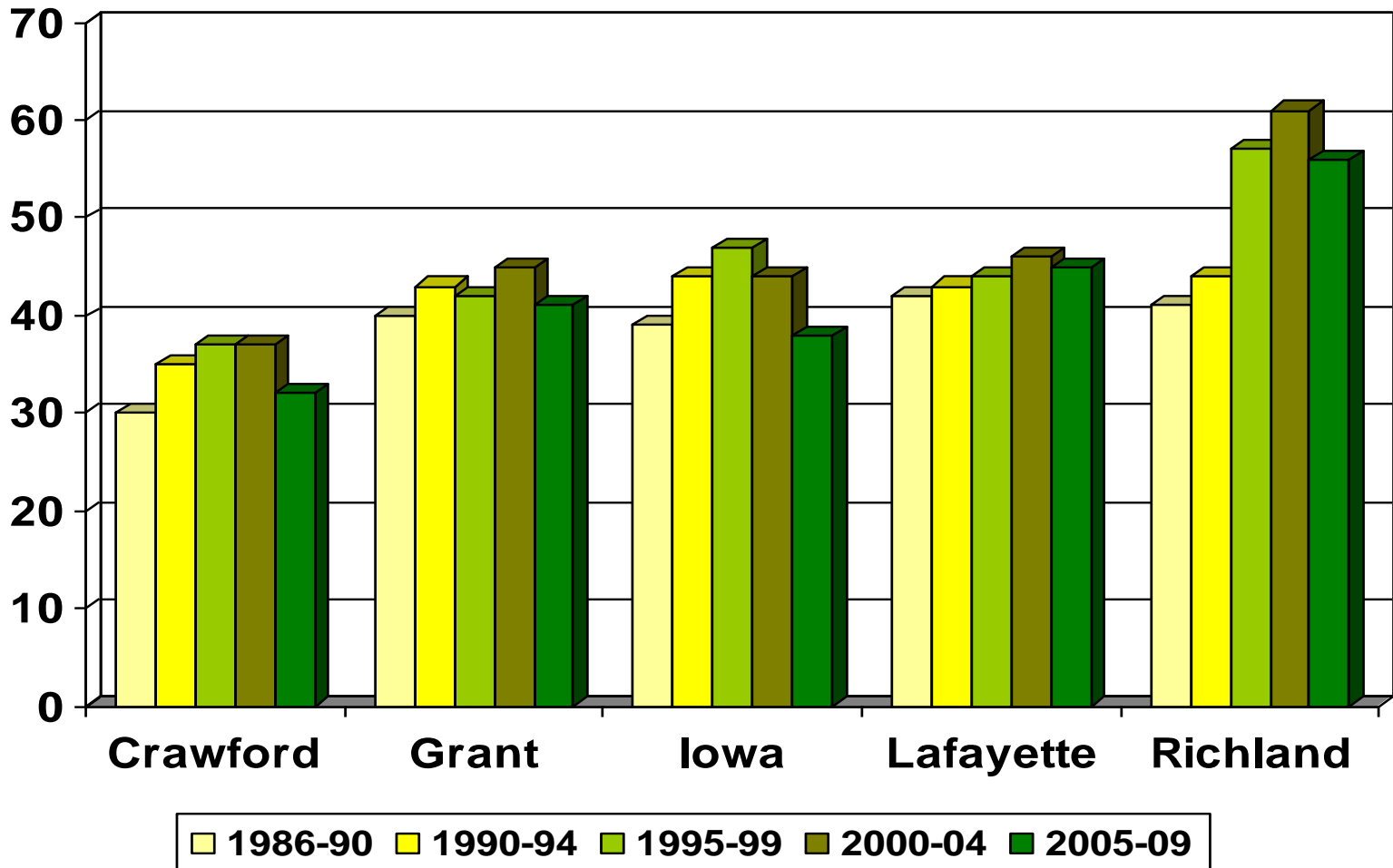
# Regional pH Averages



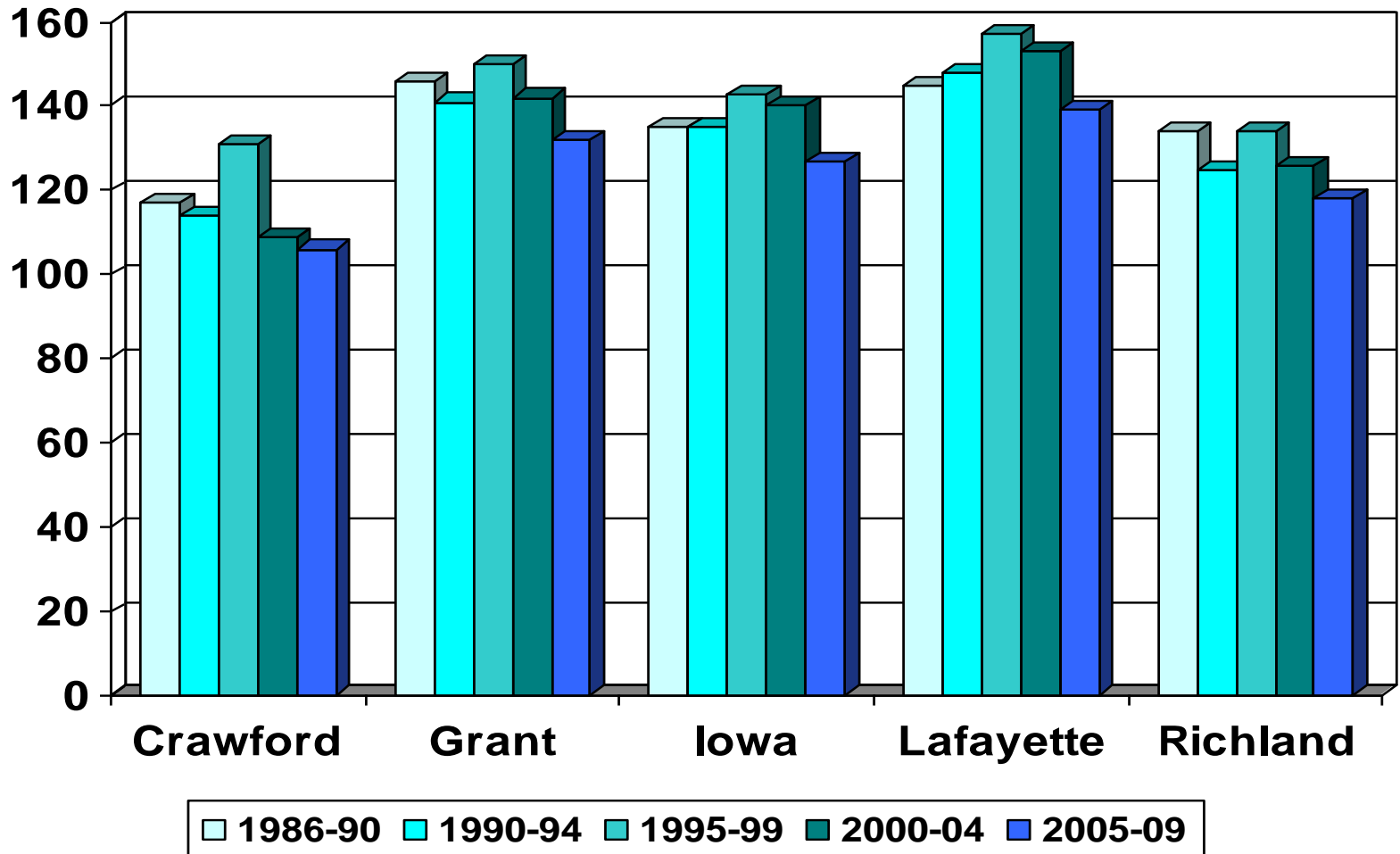
# Regional Organic Matter % Averages



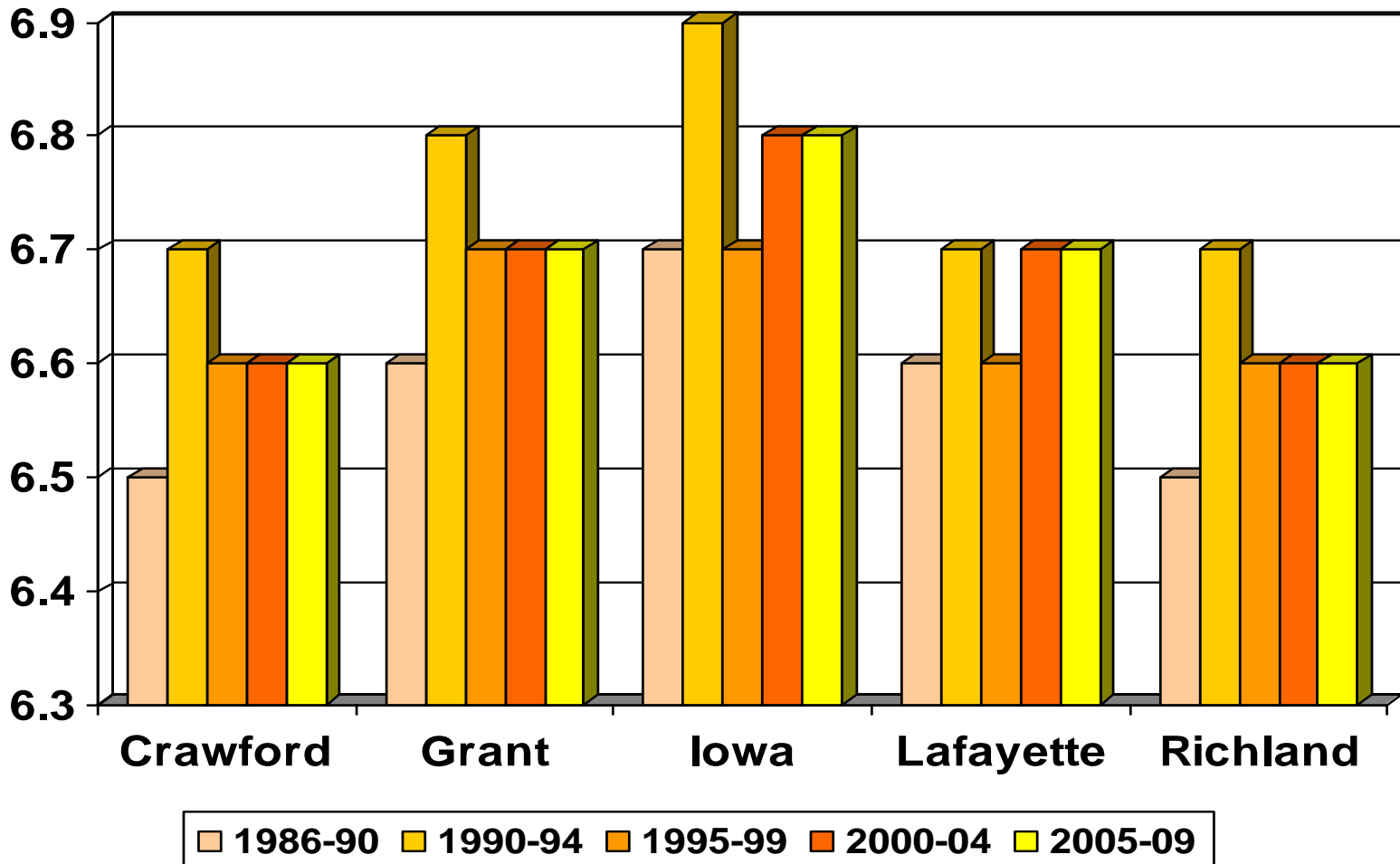
# Regional Phosphorus Averages



# Regional Potassium Averages



# Regional pH Averages



# Regional Organic Matter % Averages

