IPNI
INTERNATIONAL
PLANT NUTRITION
INSTITUTE

Soil Test Levels in North America, 2010

IPNI Publication No. 30-3110

IPNI

Summary Procedures

- Conducted periodically by IPNI, current = 10th
- Samples from fall 2009 – spring 2010
- Data reported:
  - Median P, K, and pH values
  - Relative frequency across soil test ranges for P, K, pH, Mg, S, Zn, Cl^-
- 4.4 million samples
- Data from 63 public and private labs

Private Laboratories

A&L Analytical Labs, Inc. - Memphis, TN
A&L Canada Laboratories, Inc. - London, ON
A&L Eastern - Richmond, VA
A&L Great Lakes Labs, Inc. - Fort Wayne, IN
Agri-Food Laboratories, Guelph, ON
AgriQuanta - St-Ours, QC
AGVISE Laboratories - Northwood, ND
ALS - Calgary, AB
Brookside Lab, Inc. - New Knoxville, OH
Dellavalle Laboratory, Inc. - Fresno, CA
Frontier Labs - Clear Lake, IA
Laboratoire Géosol - Mont St-Hilaire, QC
GMS Laboratories - Cropsey, IL
La Coop fédérée - Longueuil, QC
LGI - Ellsworth, IA
Litchfield Analytical Services - Litchfield, MI
MDS Harris - Lincoln, NE
Midwest Laboratories, Inc. - Omaha, NE
Olsen's Ag Lab - McCook, NE
Precision Agri-Lab - Madera, CA
Rock River Lab - Watertown, WI
Servi-Tech, Inc. - Amarillo, TX
Servi-Tech, Inc. - Dodge City, KS
Servi-Tech, Inc. - Hastings, NE
SGS Alvey Laboratory, Inc. - Belleville, IL
SGS MWSS, Inc. - Brookings, SD
Spectrum Analytic, Inc. - Washington Court House, OH
SURE-TECH Laboratories - Indianapolis, IN
Ward Laboratories, Inc. - Kearney, NE
Western Laboratories - Parma, ID
William Houde, Ltd. - St-Simon, QC

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Public Laboratories

Auburn University
Clemson University
Colorado State University
Department of Natural Resources Corner Brook, NL
Iowa State University
Kansas State University
Kentucky Division of Regulatory Services
Michigan State University
Mississippi State University
New Brunswick Agriculture and Aquaculture
New Mexico State University
North Carolina Department of Ag
North Dakota State University
Nova Scotia Department of Agriculture
Oklahoma State University
PEI Soil & Feed Testing Laboratory
South Dakota State University
Texas A&M University
The Pennsylvania State University
University of Arkansas
University of Connecticut
University of Delaware
University of Florida
University of Georgia
University of Guelph
University of Maine
University of Missouri
University of New Hampshire
University of Tennessee
University of Vermont
University of Wyoming
Virginia Tech

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Summary cautions

- Quantity of sample results is low in several states and provinces.
- An inexact time frame was given to labs since they were asked to contribute samples collected for decision-making for the 2010 crop year.
- Not all sample results could be definitively associated with a particular state.
- It is likely that the better managers regularly test their soil and that their results may not be representative of those that do not soil test.
- Due to the requirement of nutrient management plans for many livestock operations, the percent of samples in the summary from manured fields could be higher than in the past for some regions and inflate soil test levels, especially for P.
- Although an attempt was made to define calibration equivalency for each of the soil test categories among the various testing procedures, it is likely that error was introduced in this process.
- Some laboratory data were submitted using categories other than those specified in the sampling protocol, and interpolation routines were created and used to translate between the two systems.

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Figure 5. Median Bray P-1 equivalent soil test levels, 2010.

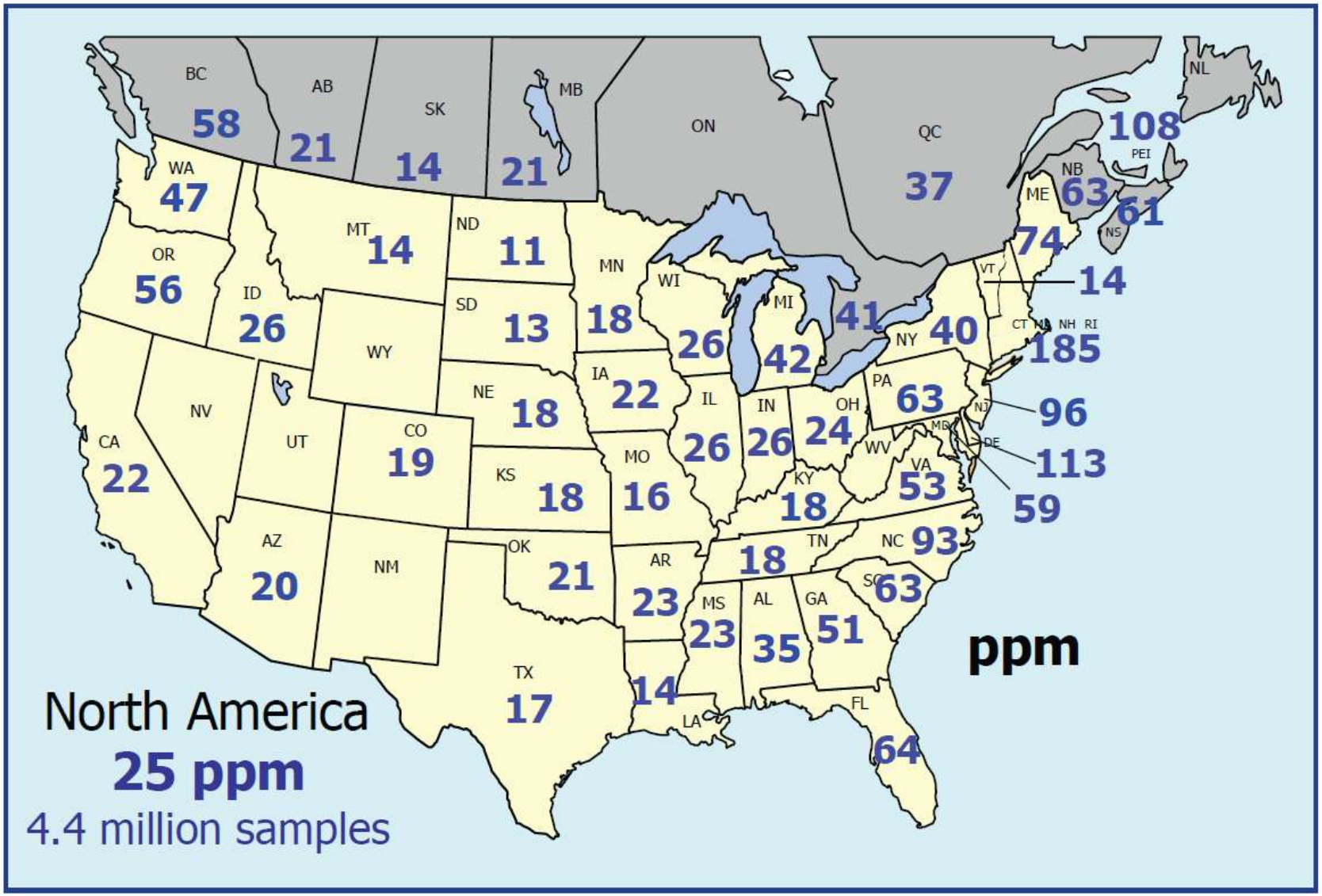
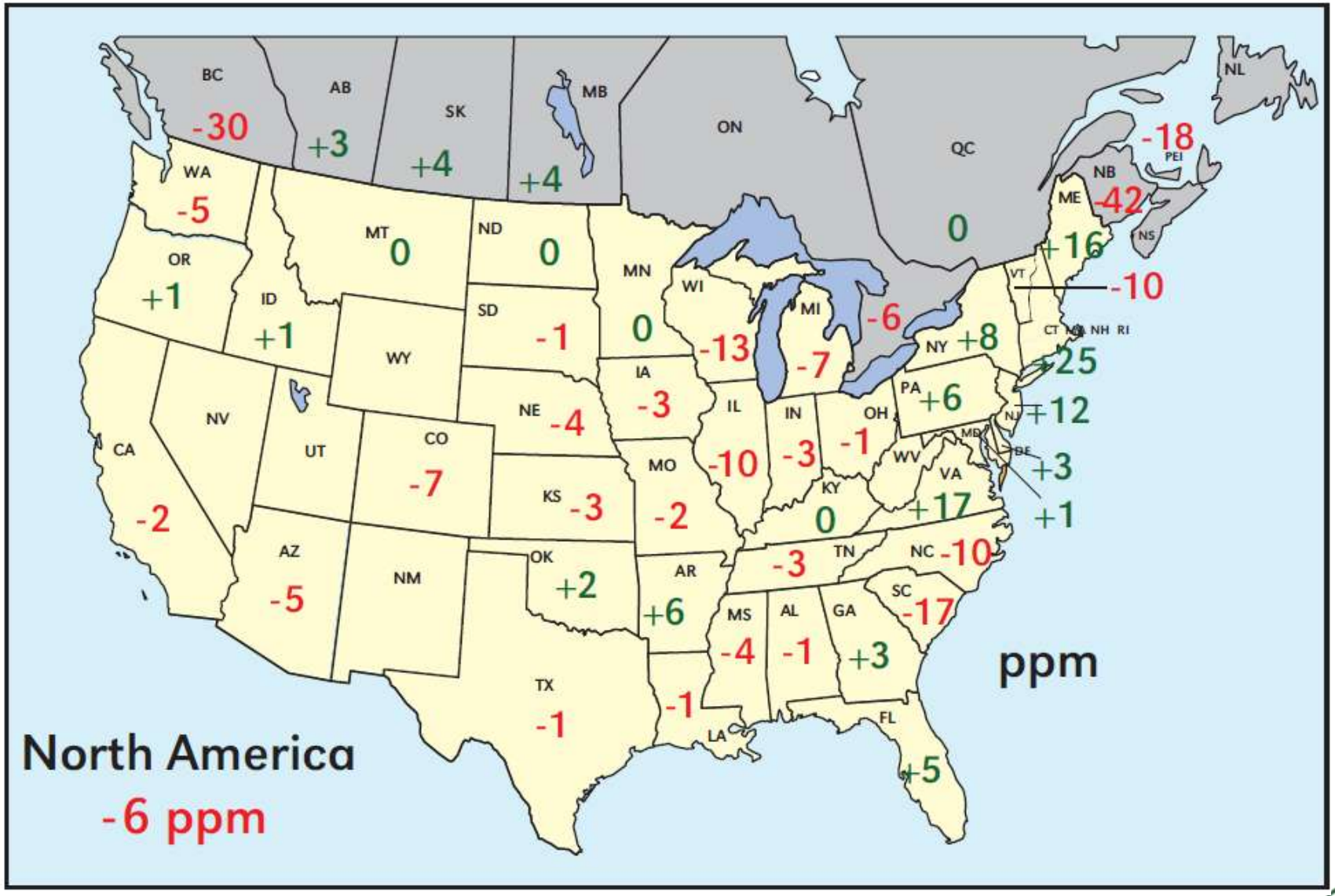
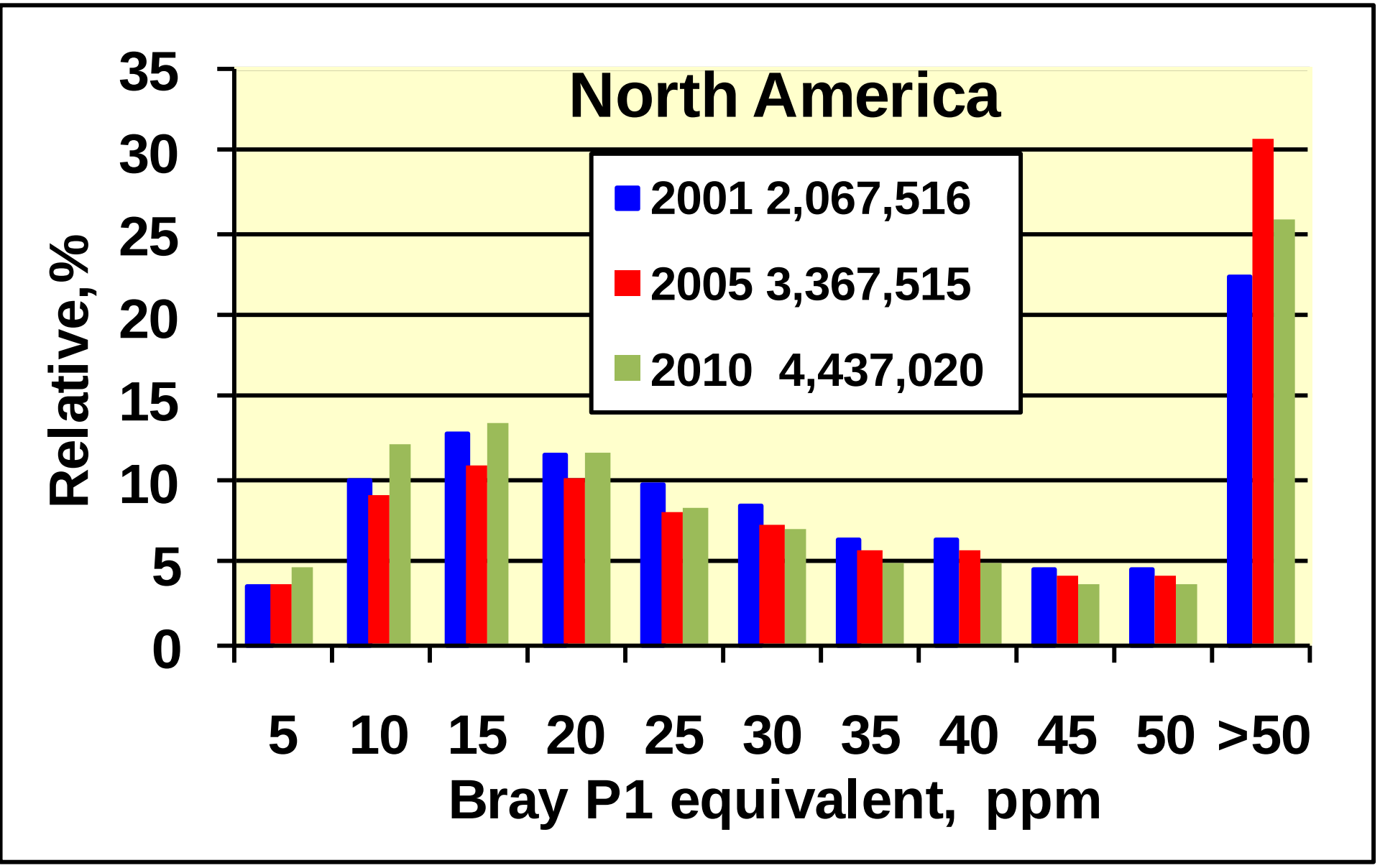
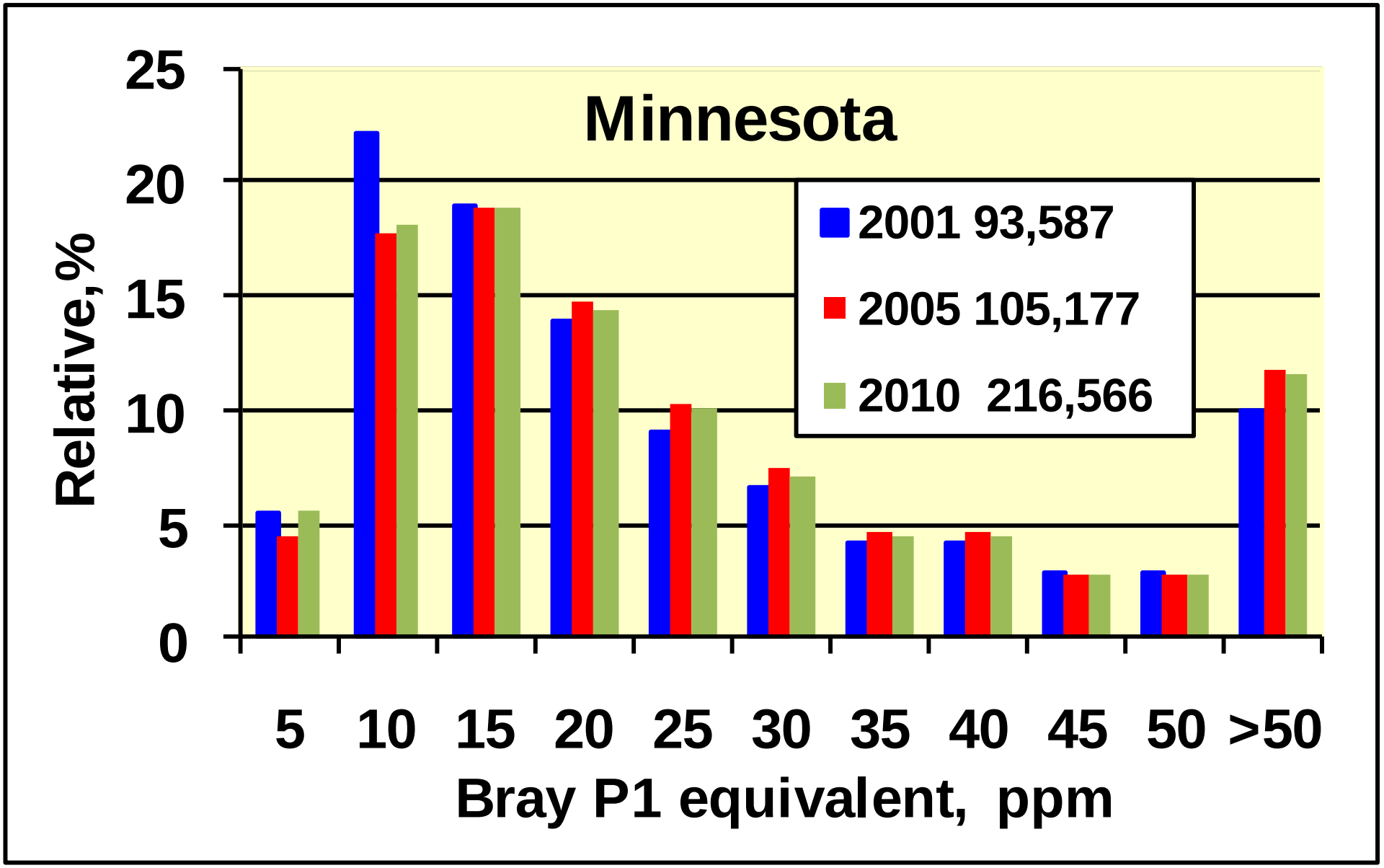
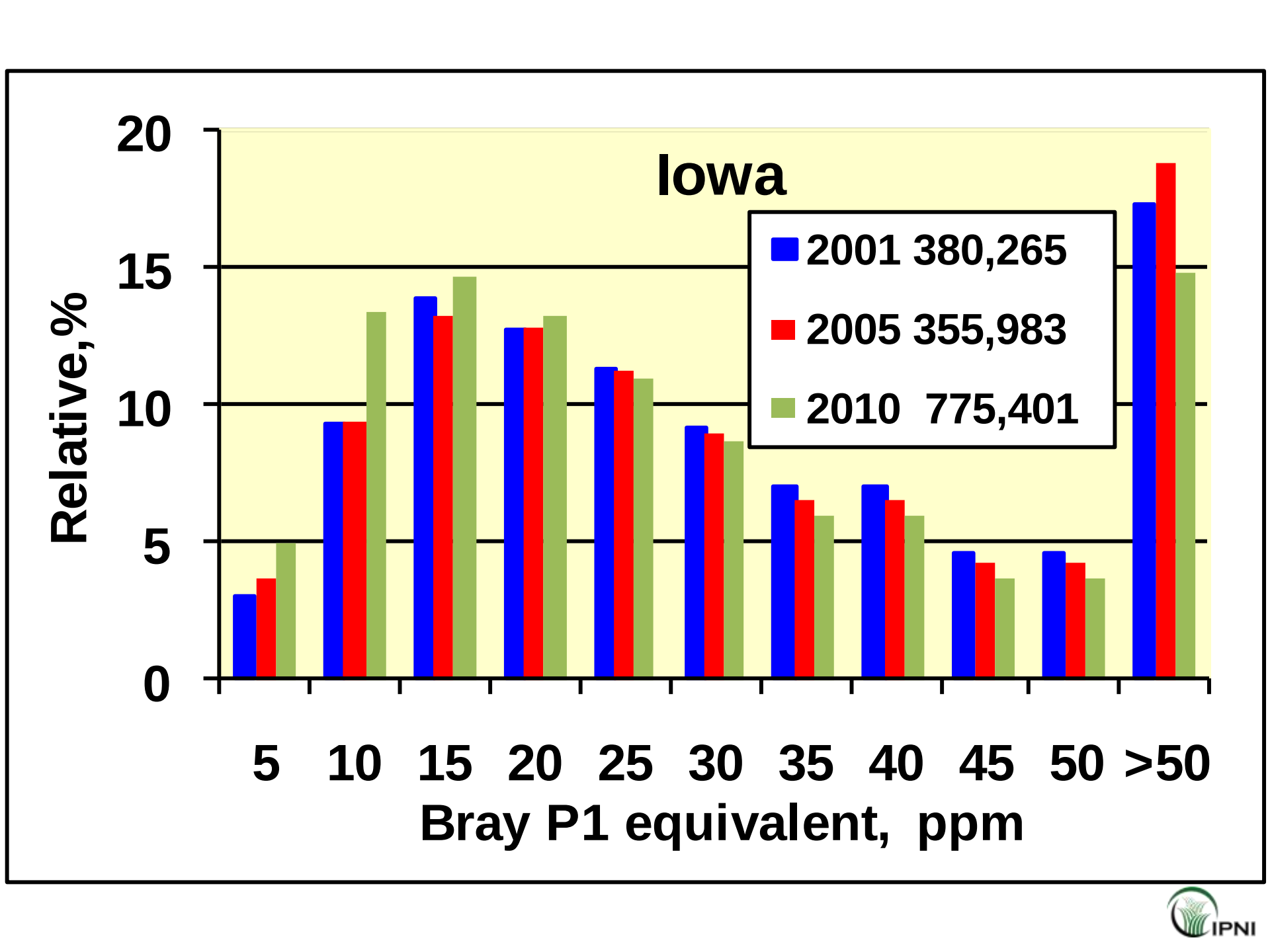


Figure 8. Change in median Bray P equivalent soil test levels from 2005 to 2010.

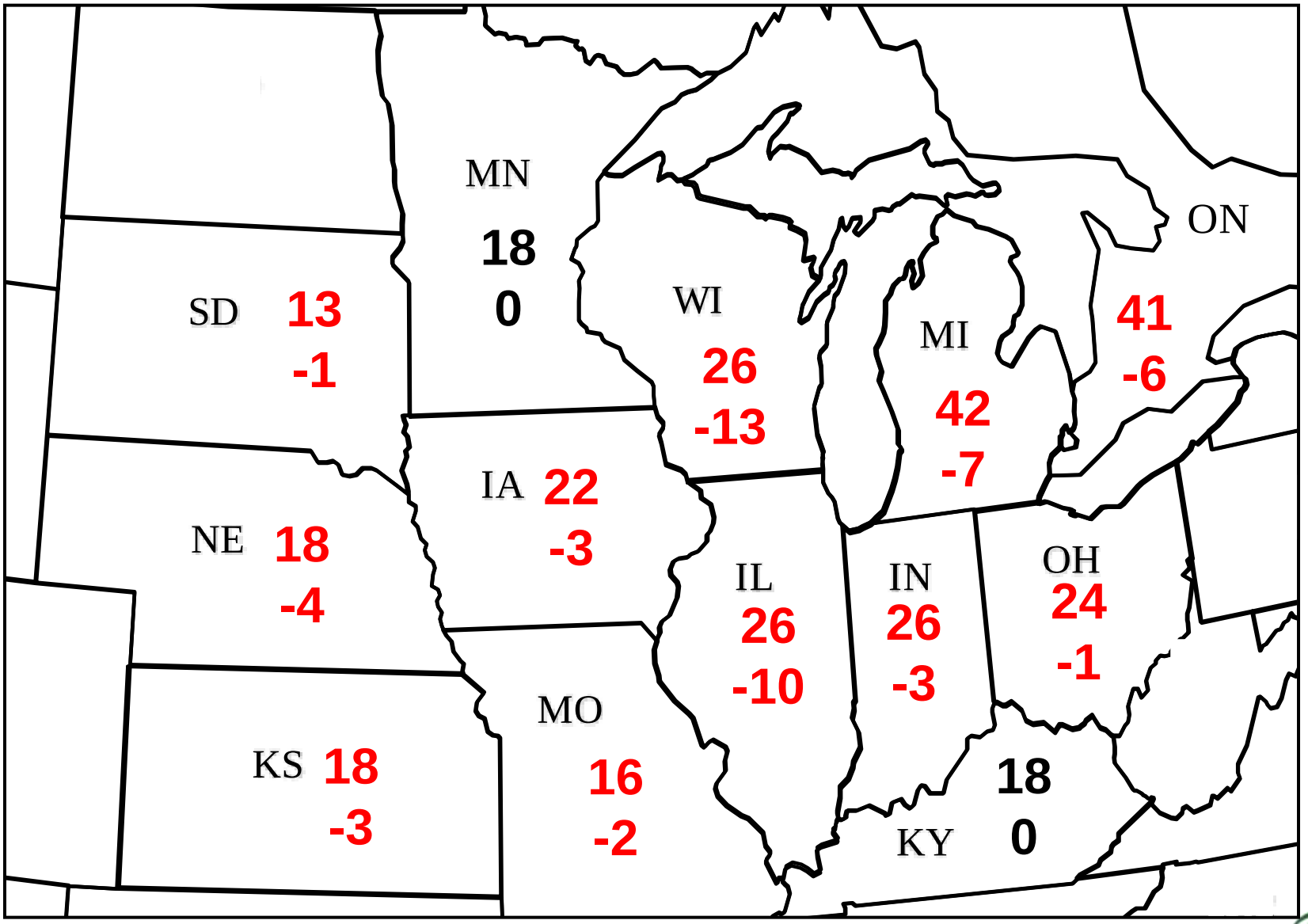



North America
2001 2,067,516
2005 3,367,515
2010 4,437,020
Relative,%
35
30
25
20
15
10
5
0
5
10
15
20
25
30
35
40
45
50
>50
Bray P1 equivalent, ppm


Minnesota
2001 93,587
2005 105,177
2010 216,566
Relative,%
25
20
15
10
5
0
5
10
15
20
25
30
35
40
45
50
>50
Bray P1 equivalent, ppm


Iowa
2001 380,265
2005 355,983
2010 775,401
Relative,%
20
15
10
5
0
5
10
15
20
25
30
35
40
45
50
>50
Bray P1 equivalent, ppm

2010 median soil P levels* and change from 2005 (Soil samples, millions: 2005=2.0; 2010=3.0)



*Median Bray P1 equivalent, ppm

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Soil test P distribution in 2010 compared to 2005 for the Corn Belt (12 states plus Ontario)

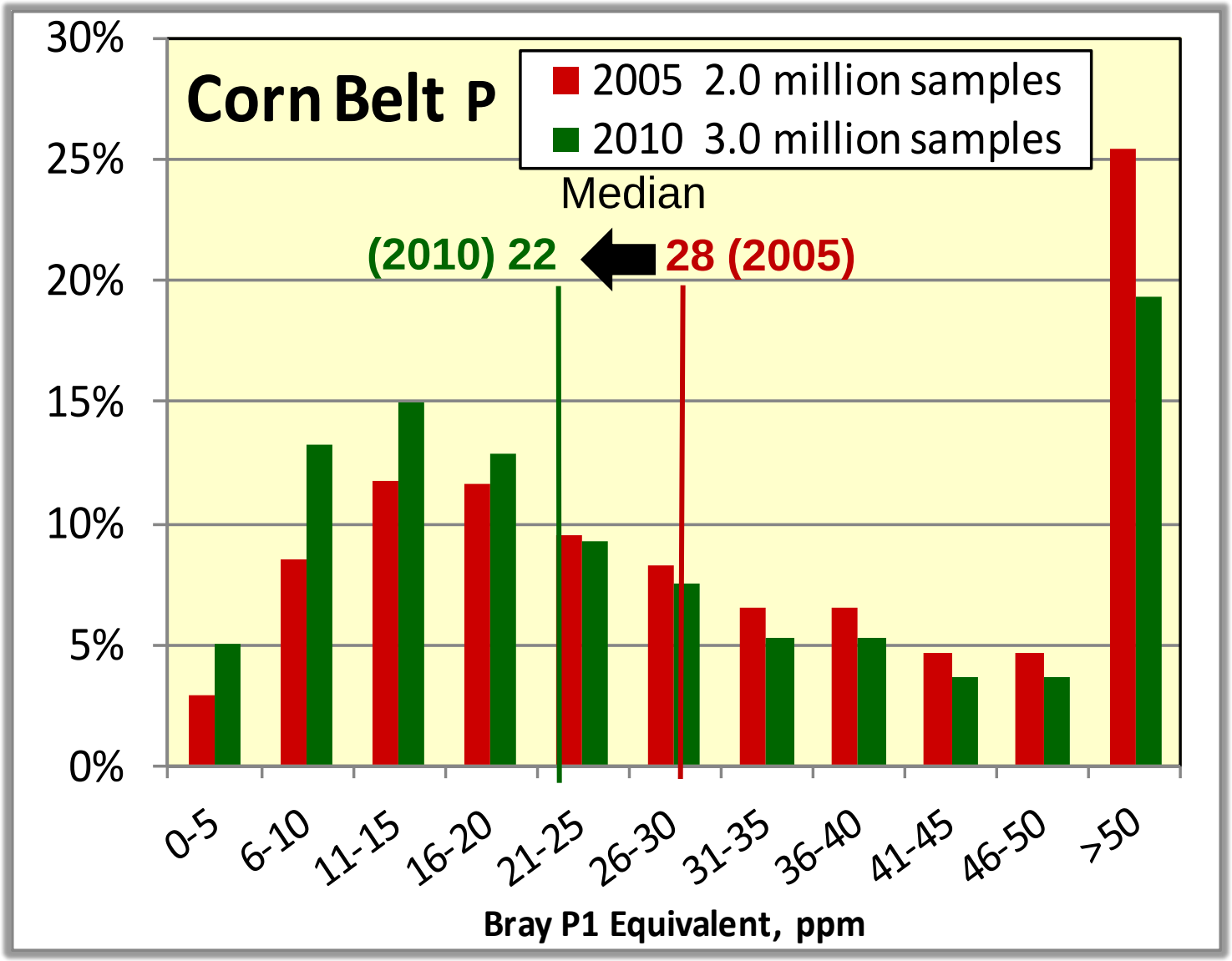
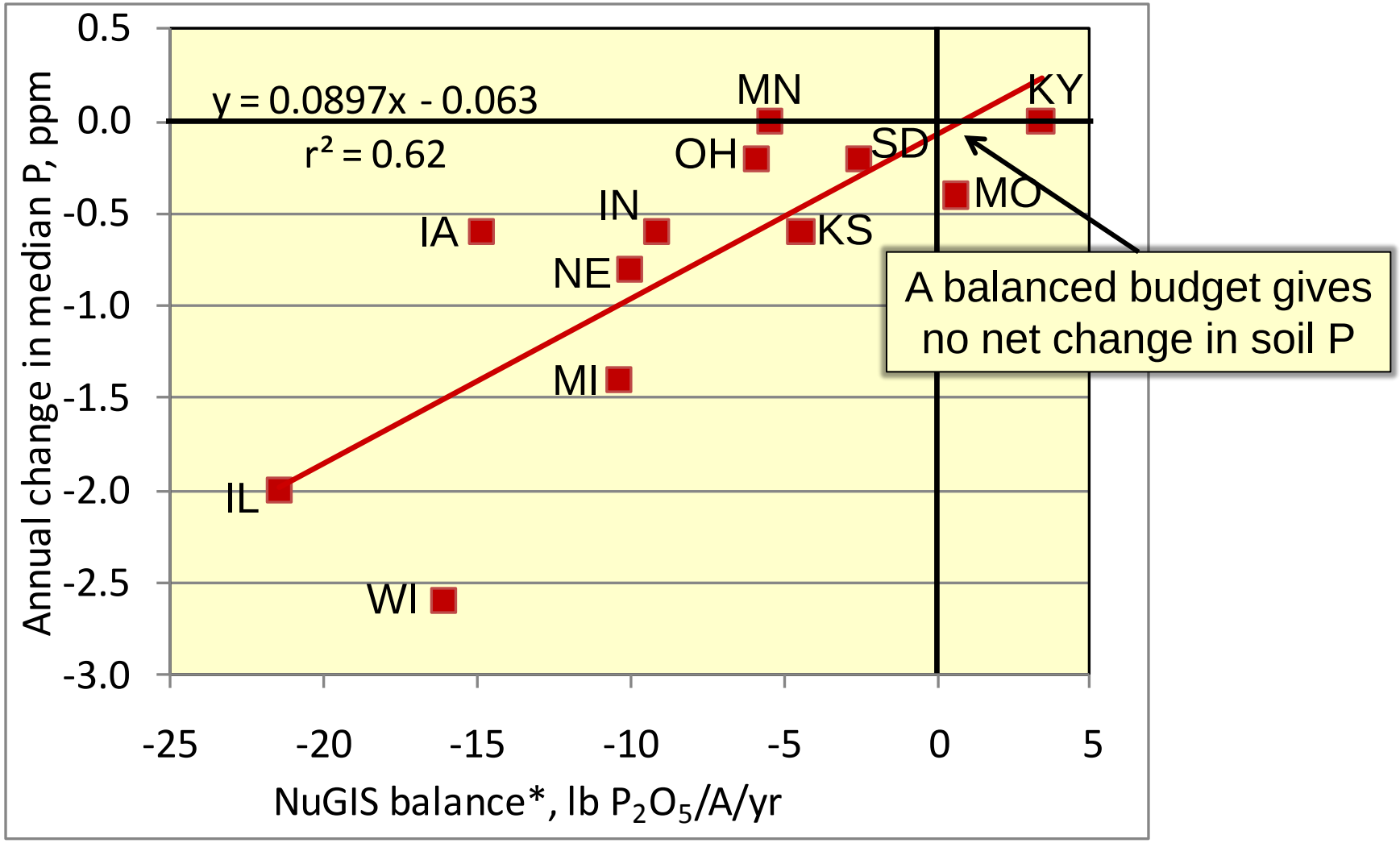


Figure 9. Annual change in median soil P level for 12 Corn Belt states as related to state P balance, 2005-2009.



*NuGIS is a GIS nutrient balance model (IPNI, 2010).

Figure 10. Median soil test K levels in 2010.

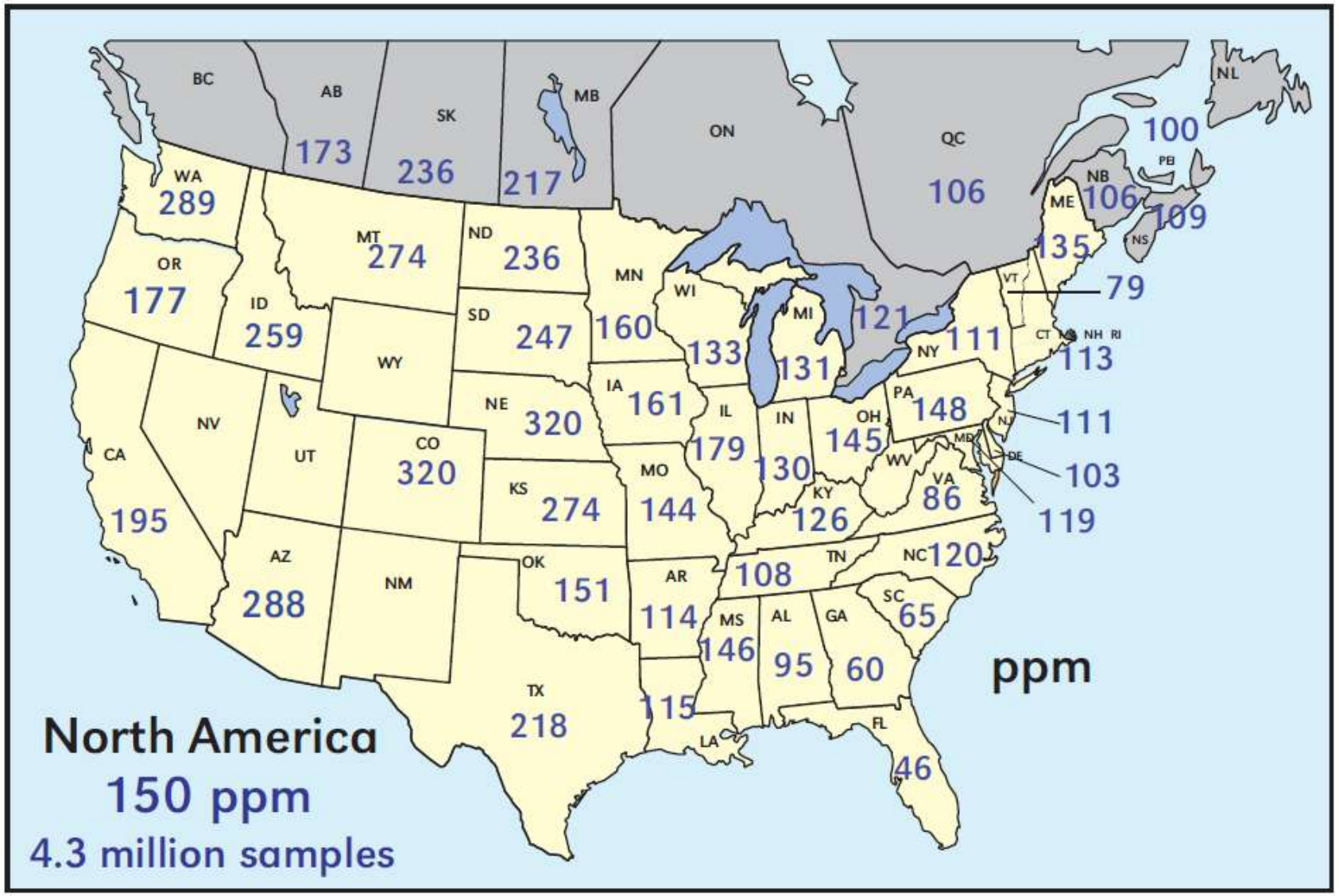
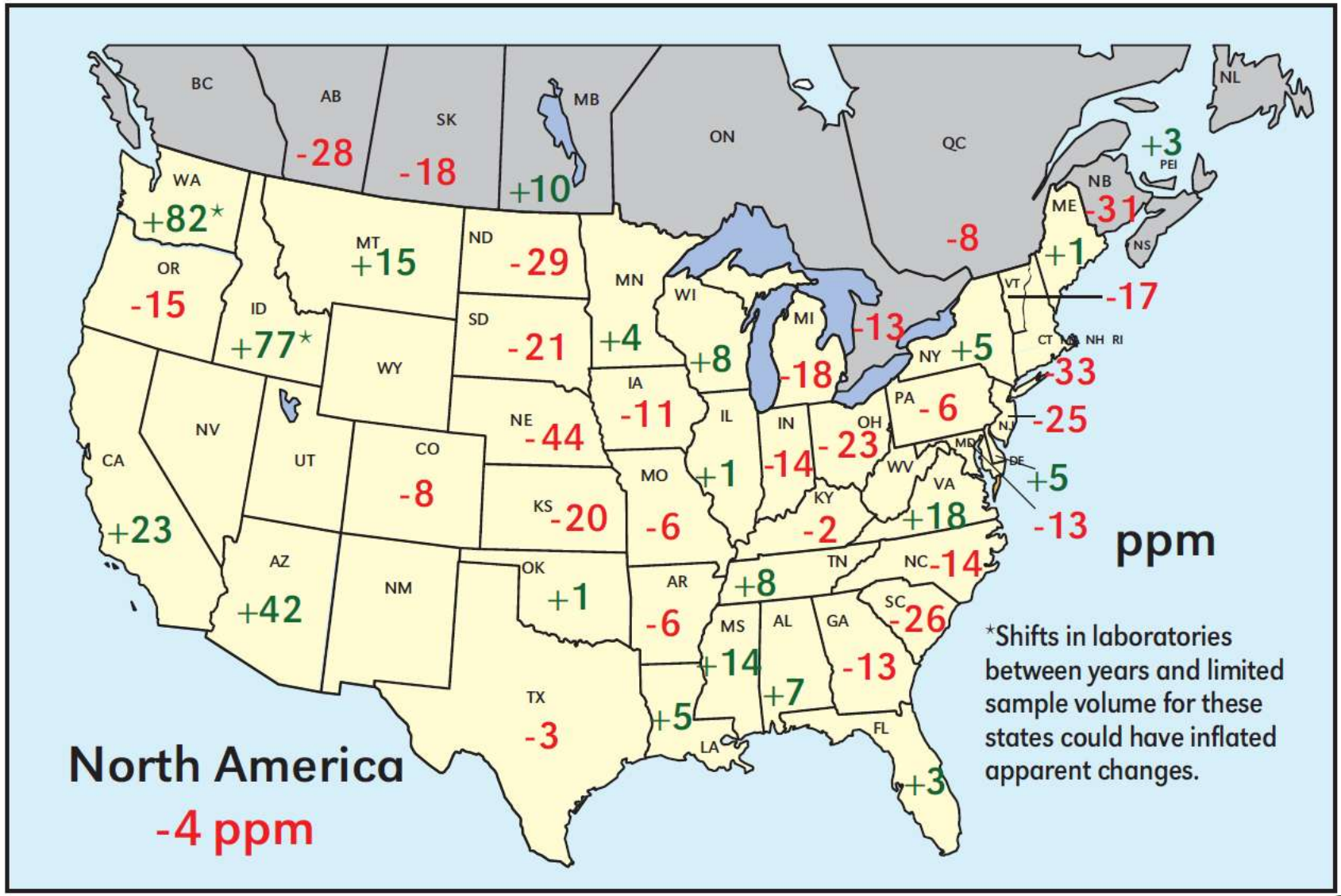
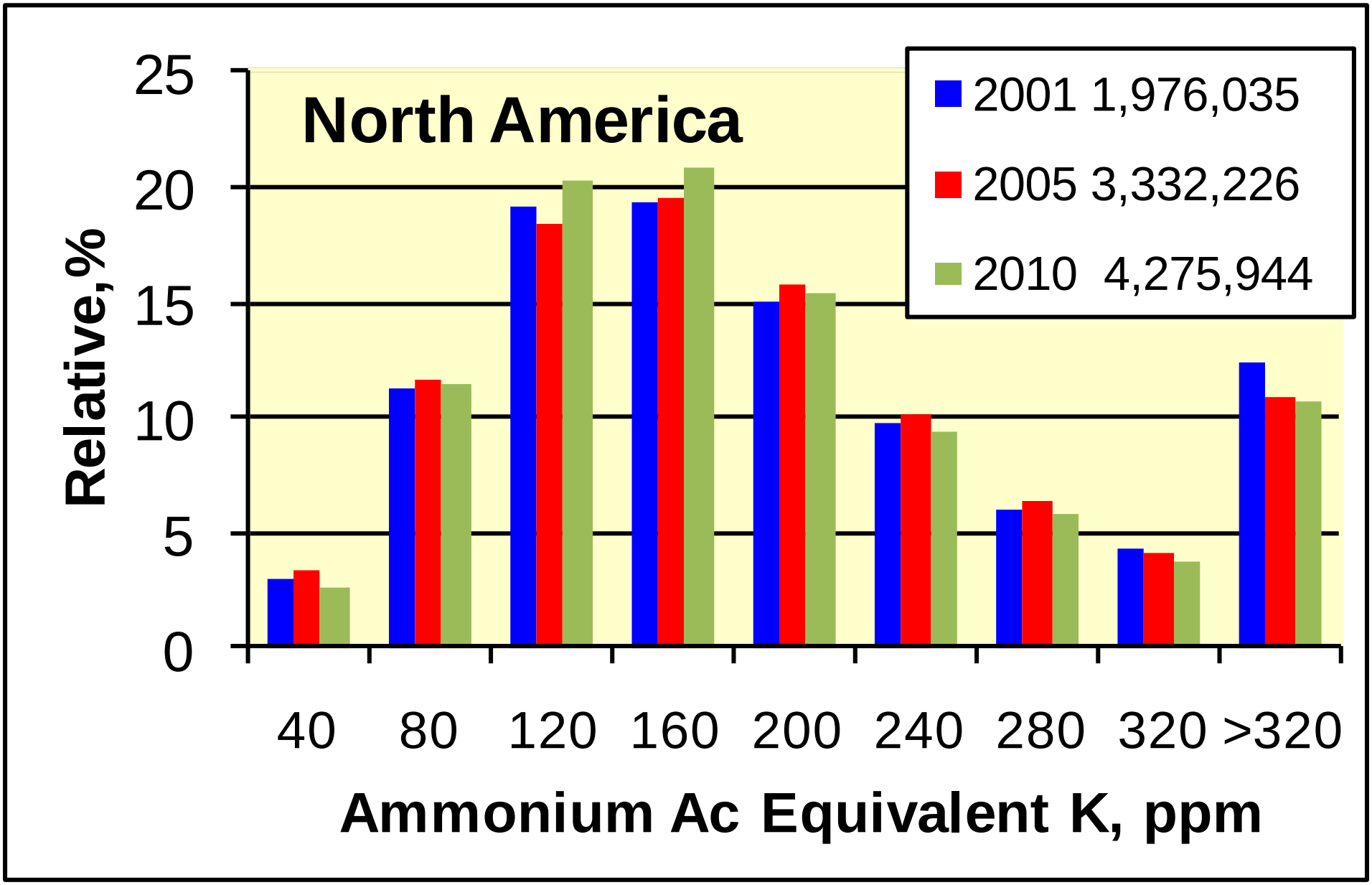
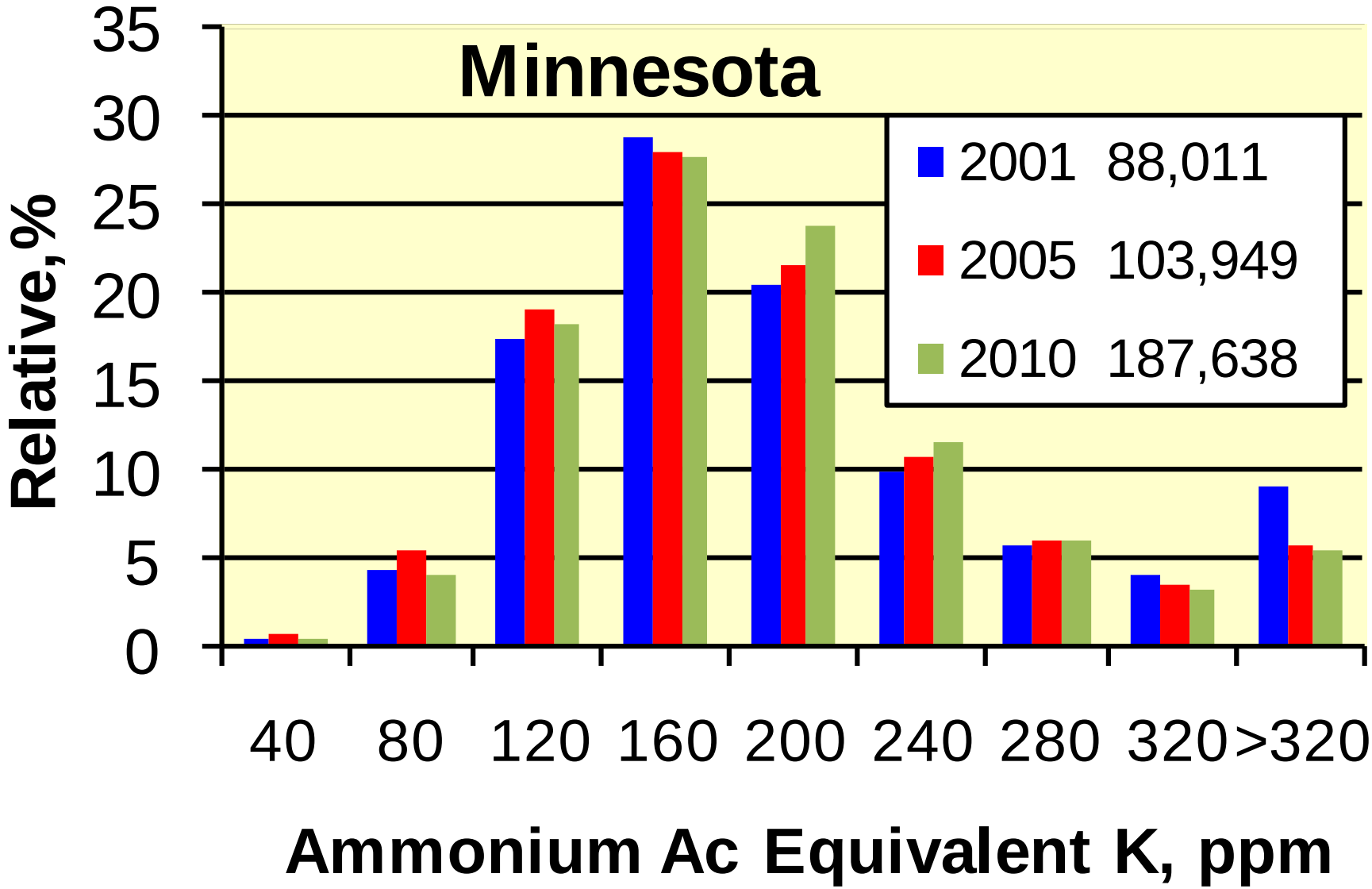


Figure 13. Change in median soil K level from 2005 to 2010.




North America
2001 1,976,035
2005 3,332,226
2010 4,275,944
Relative,%
25
20
15
10
5
0
40
80
120
160
200
240
280
320
>320
Ammonium Ac Equivalent K, ppm


Minnesota
2001 88,011
2005 103,949
2010 187,638
Relative,%
0
5
10
15
20
25
30
35
40
80
120
160
200
240
280
320
>320
Ammonium Ac Equivalent K, ppm

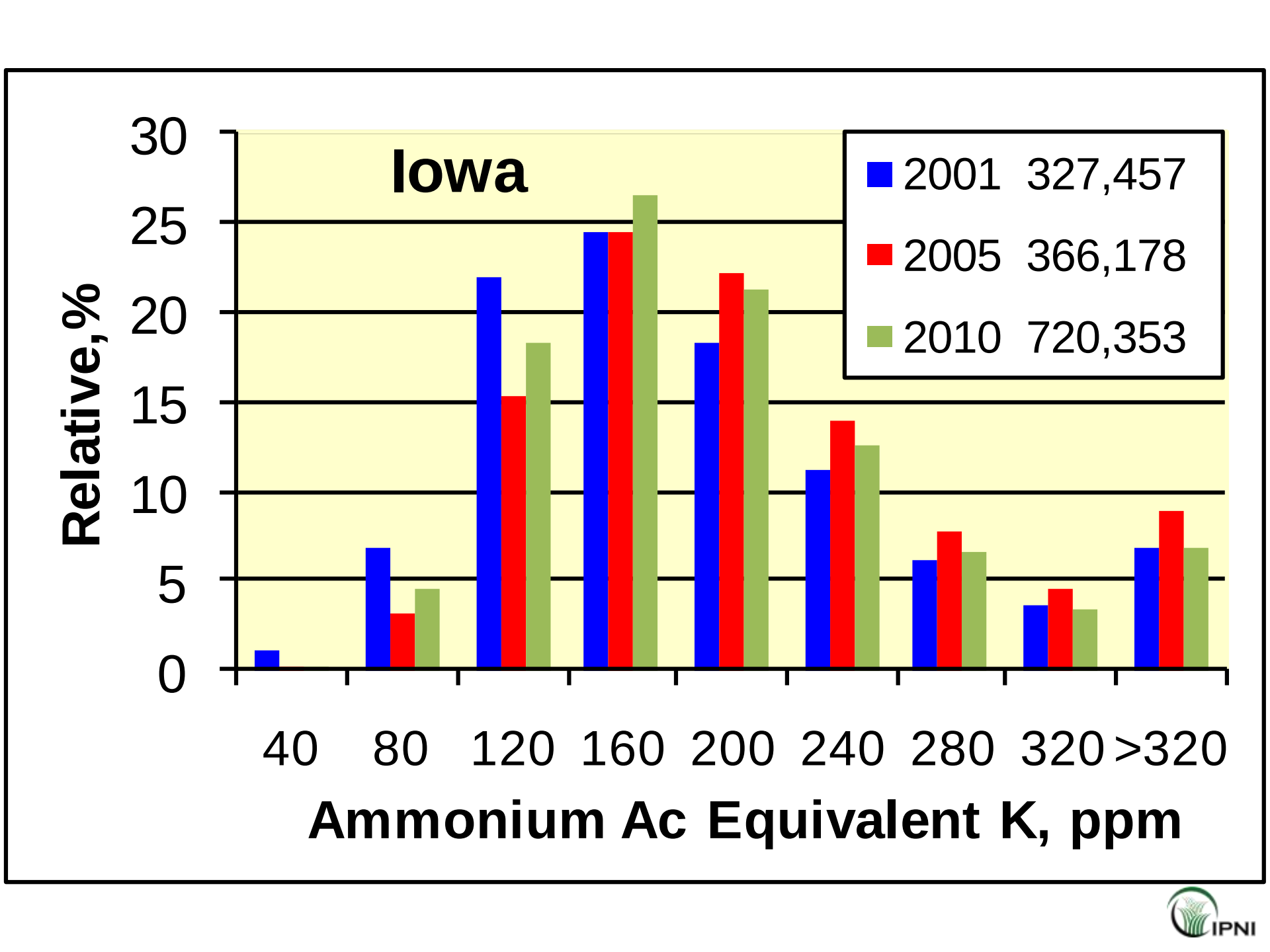

Iowa
2001 327,457
2005 366,178
2010 720,353
Relative,%
30
25
20
15
10
5
0
40
80
120
160
200
240
280
320
>320
Ammonium Ac Equivalent K, ppm

Figure 14. Median soil pH in 2010 and change from 2005.