

eKonomics

*Fernandez Soil Fertilizer Survey Research
Part 1*



PotashCorp

CURRENT PERCEPTIONS ON SOIL FERTILITY RECOMMENDATIONS & STATUS OF SOIL FERTILITY IN ILLINOIS

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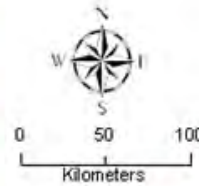
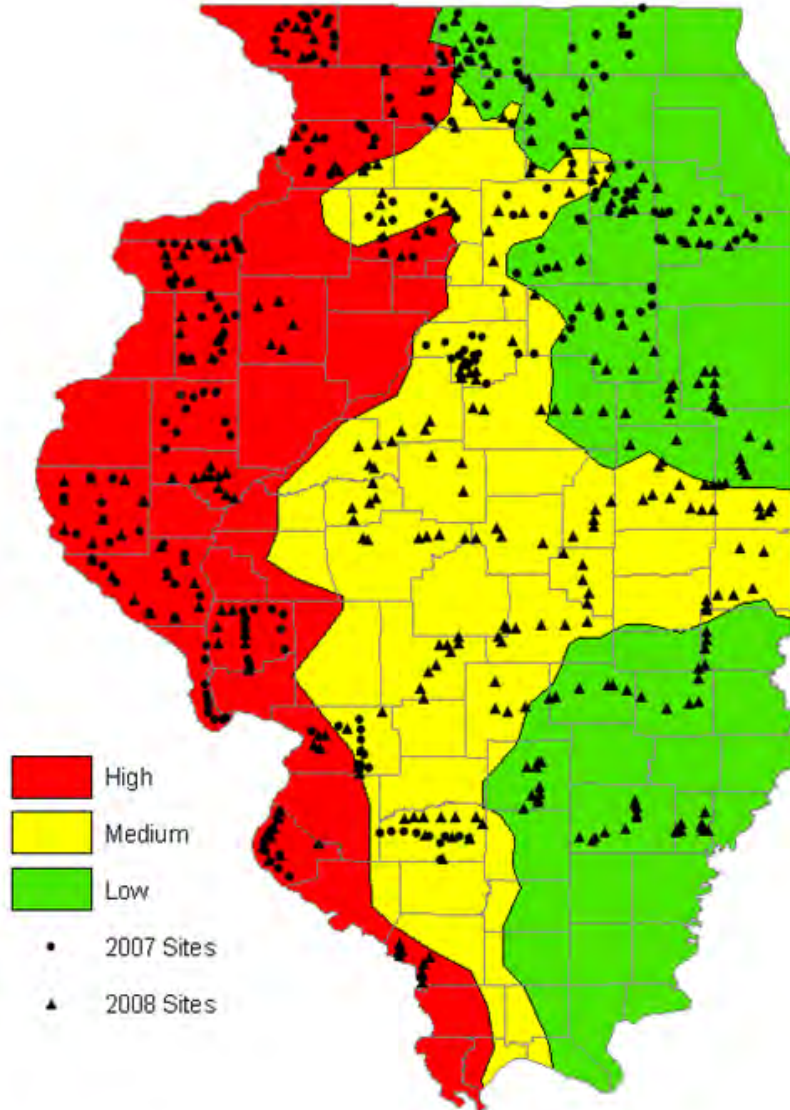
Purpose

- To assess the general fertility of the soils in Illinois
- To determine the degree of nutrient vertical stratification in the soil profile
- To share the information with the clientele to illustrate basic concepts related to soil sampling and soil fertility management

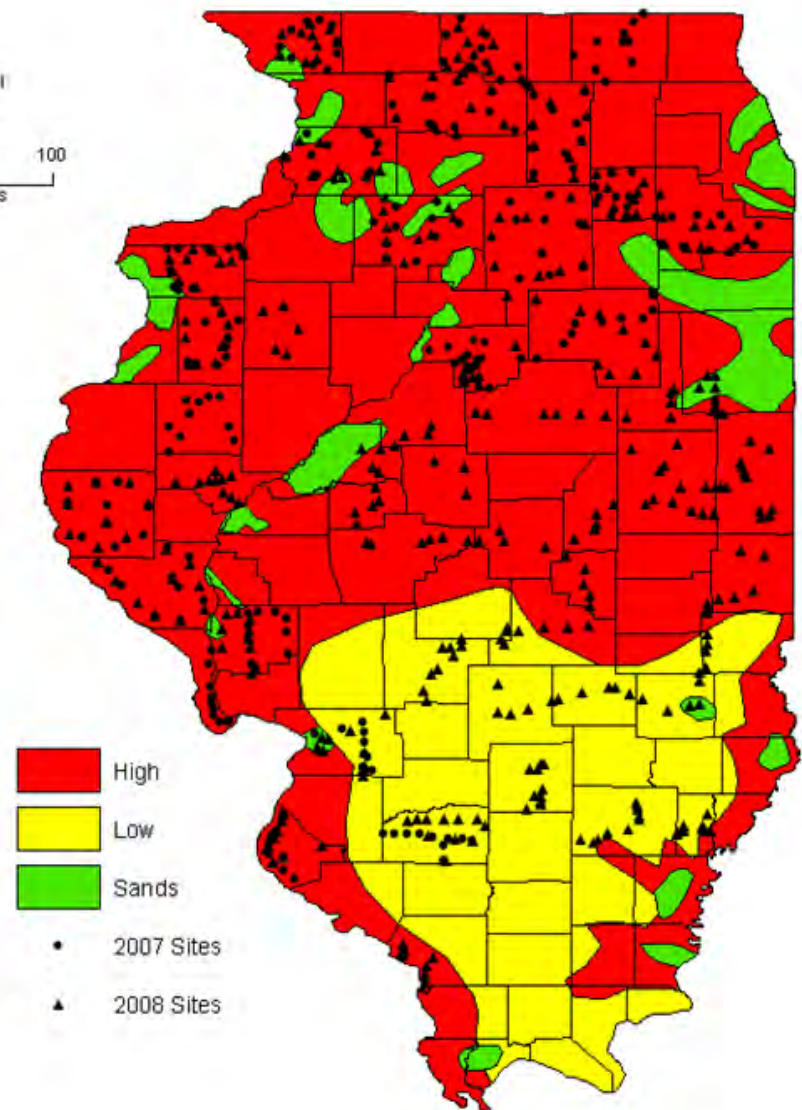
Approach

- Samples from random fields collected by many volunteers doing the European Corn Borer Survey before harvest 07 & 08
- 6-core composite from the 0-3 and 3-7 inch depth increments
- Collected randomly in slightly different positions with respect to the corn row in a geo-referenced 10-ft. diameter zone
- Bray P_1 ; NH_4OAc K, Ca and Mg; pH; OM
LOI@ 360 deg.C

Phosphorus



Potassium



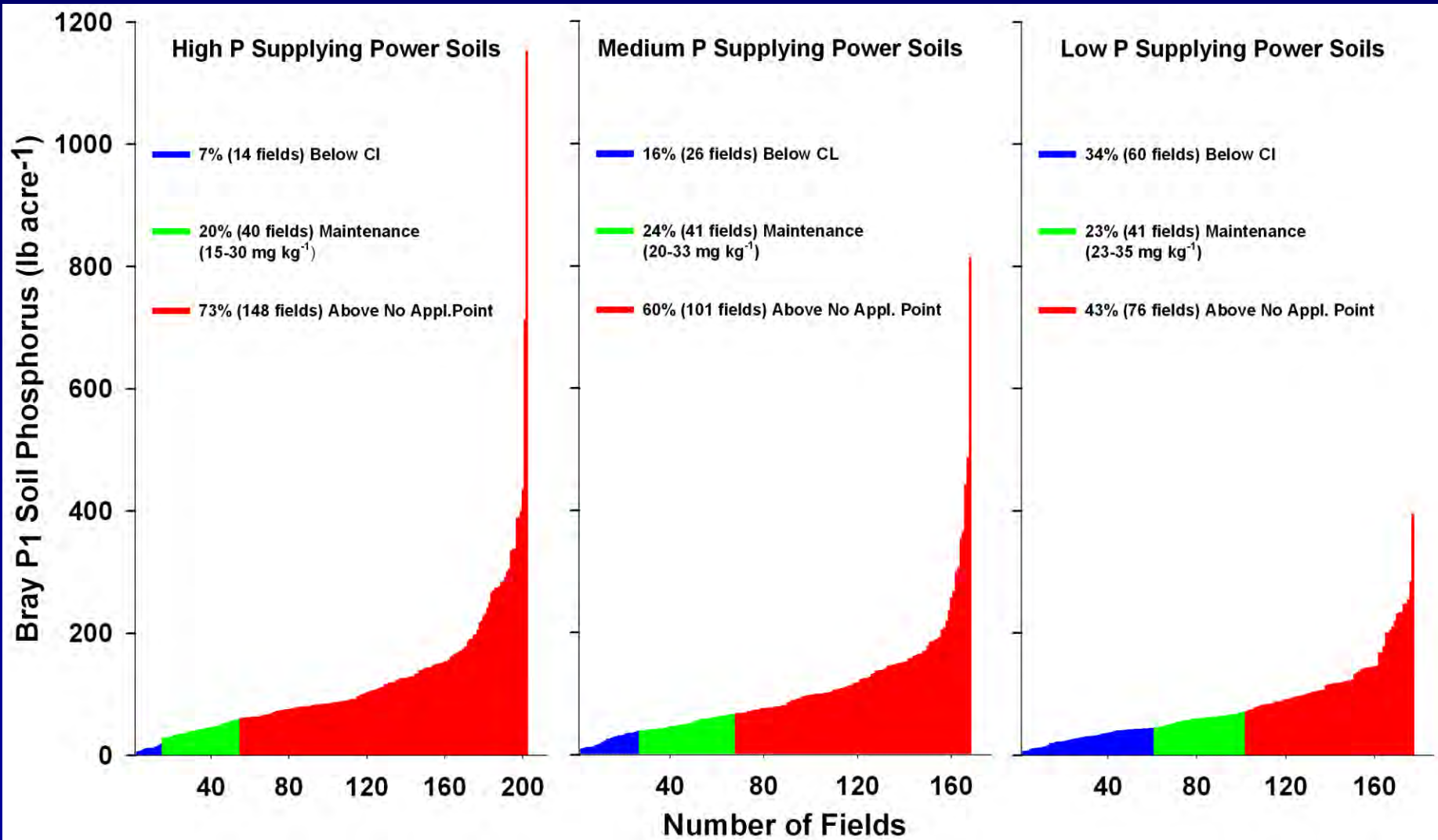
598 fields sampled in 52 counties

Descriptive Statistics (0-7 inch)

Variable	Adequate	Minimum	Maximum	Median	Mean
Phosphorus (lb acre ⁻¹)	30-70	2	1152	78	102
Potassium (lb acre ⁻¹)	260-400	62	1588	304	344
Calcium (lb acre ⁻¹)	400-800	808	12970	4094	4452
Magnesium (lb acre ⁻¹)	60-200	74	2214	658	732
pH (%)	6-6.5	4.7	8.1	6.7	6.7
OM (%)		0.9	8.9	3.2	3.3

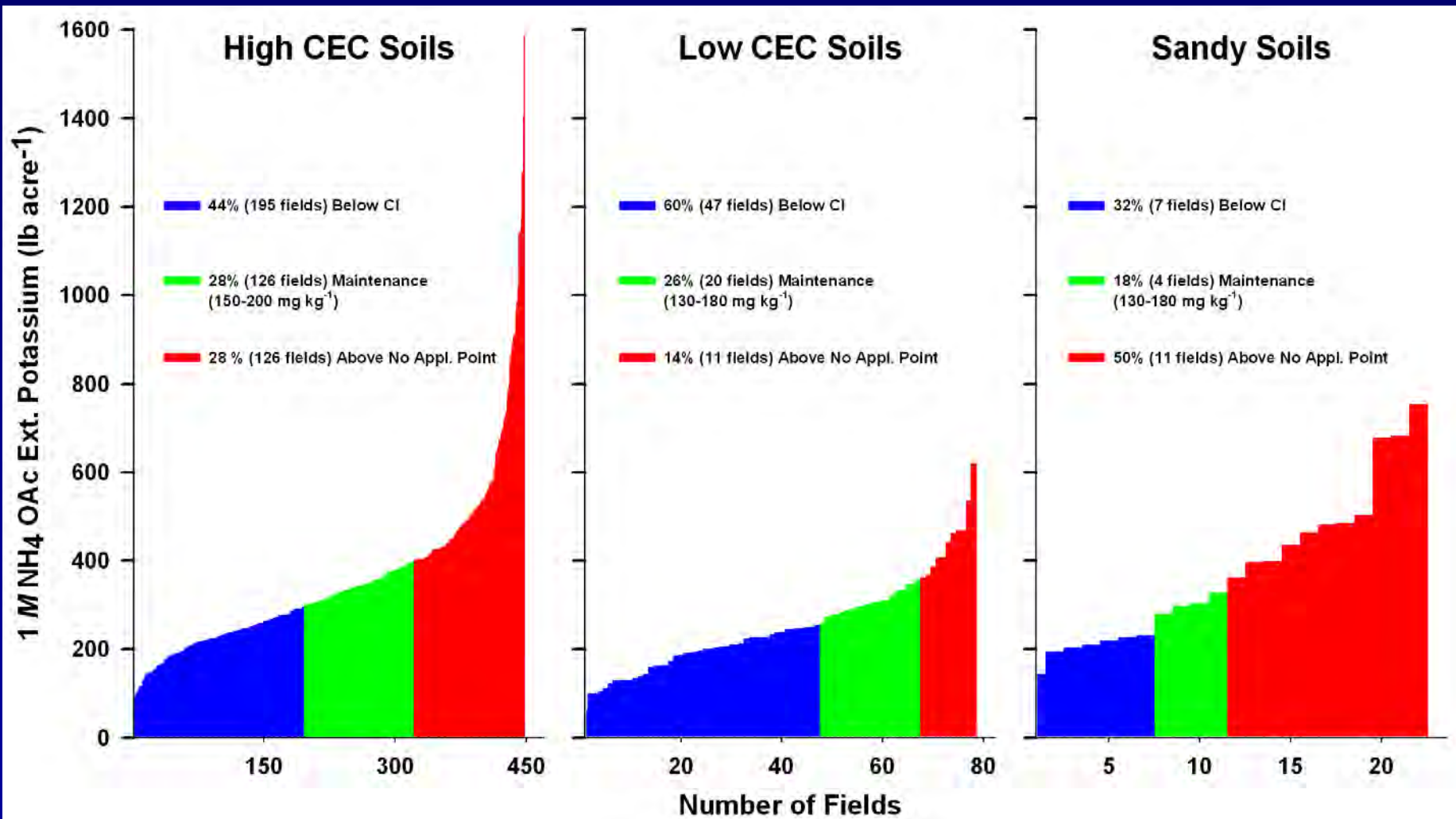
Soil P Distribution

Below CL 19% Maintenance 22% Above maintenance 59%



Soil K Distribution

Below CL 45% Maintenance 24% Above maintenance 31%



Surface to Subsurface Ratio for 547 Fields in Illinois

Soil Depth	P	K	Ca	Mg	pH	OM
inch	-----lb acre ⁻¹ -----				-----%-----	
0-3	128a	412a	4346	714	6.8a*	3.5a
3-7	80b	288b	4518	744	6.7b	3.1b
Ratio	2.4	1.5	1.0	1.0	1.0	1.2

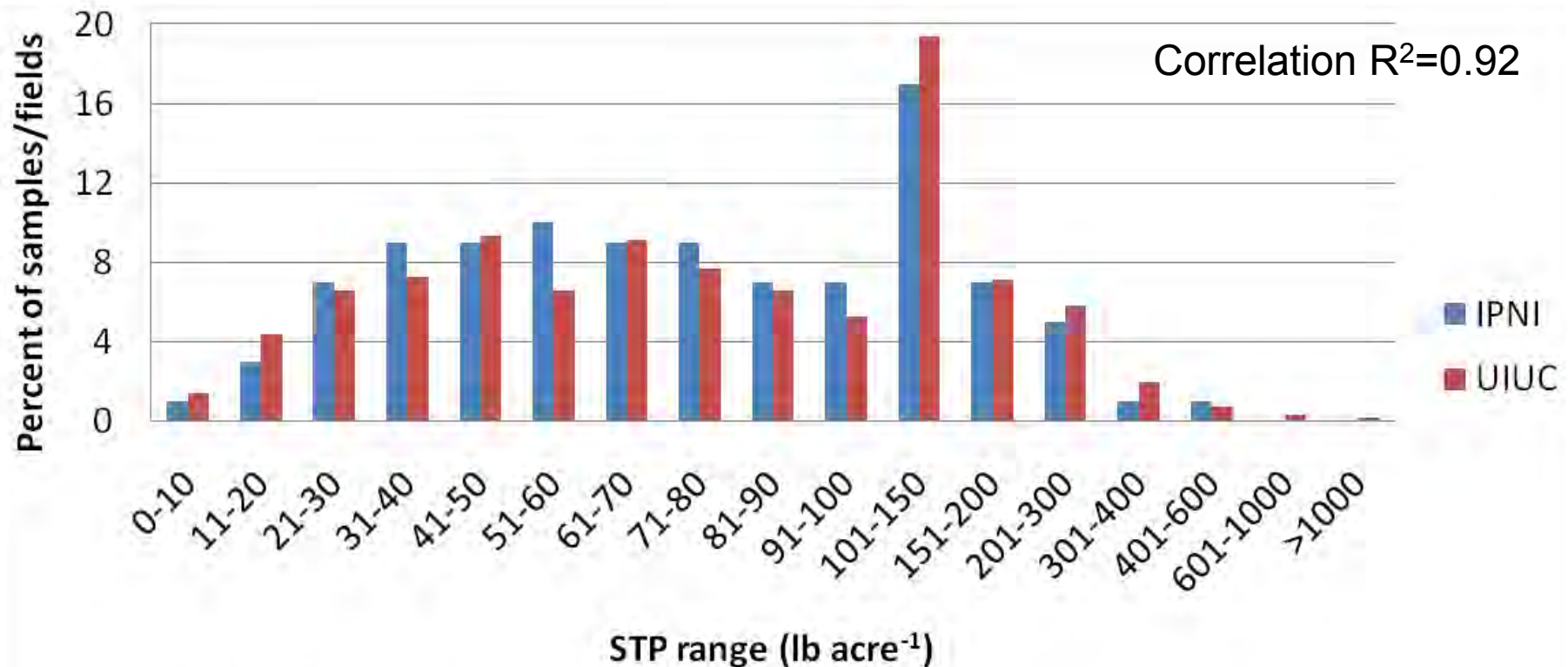
* indicate p<0.1

How Does
These Data
Compare to
Other Studies?

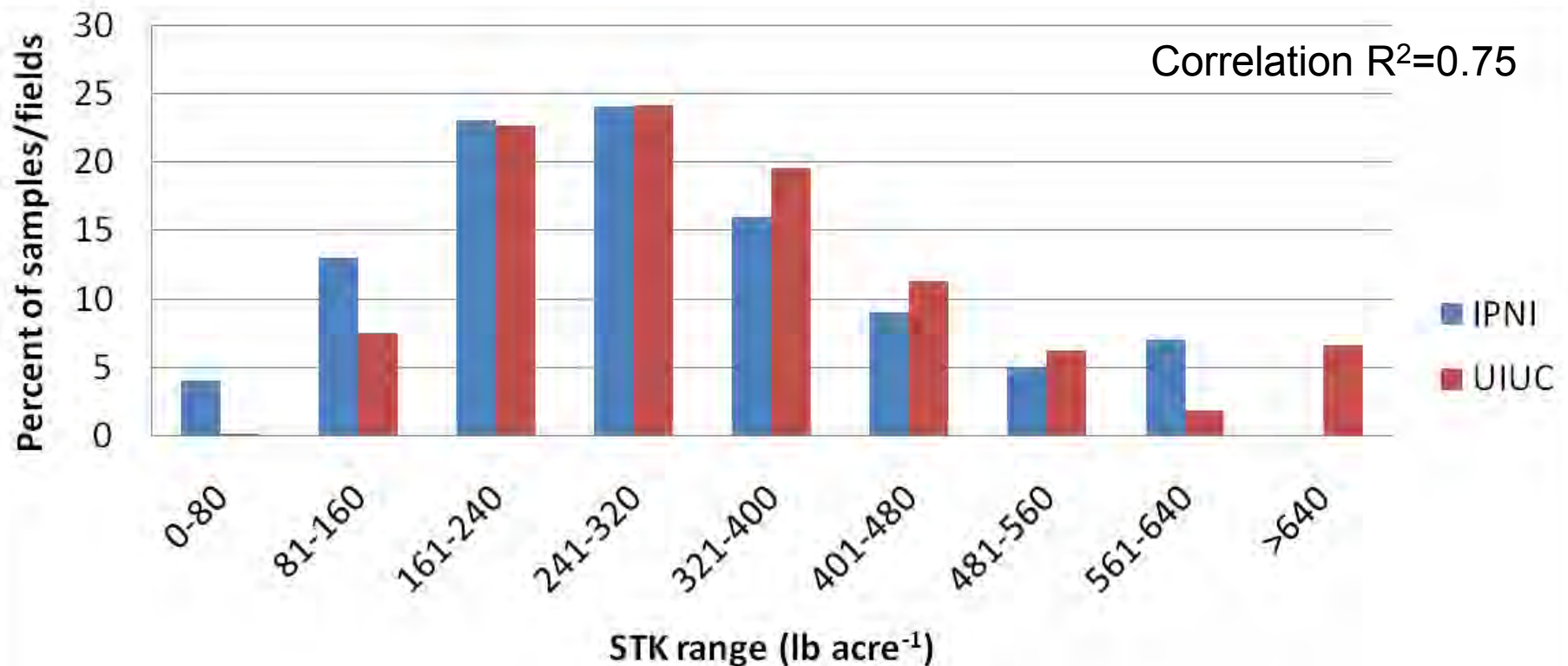
Median Value

IPNI=72 lb/a (no change 2001-2005)

UIUC=78lb/a



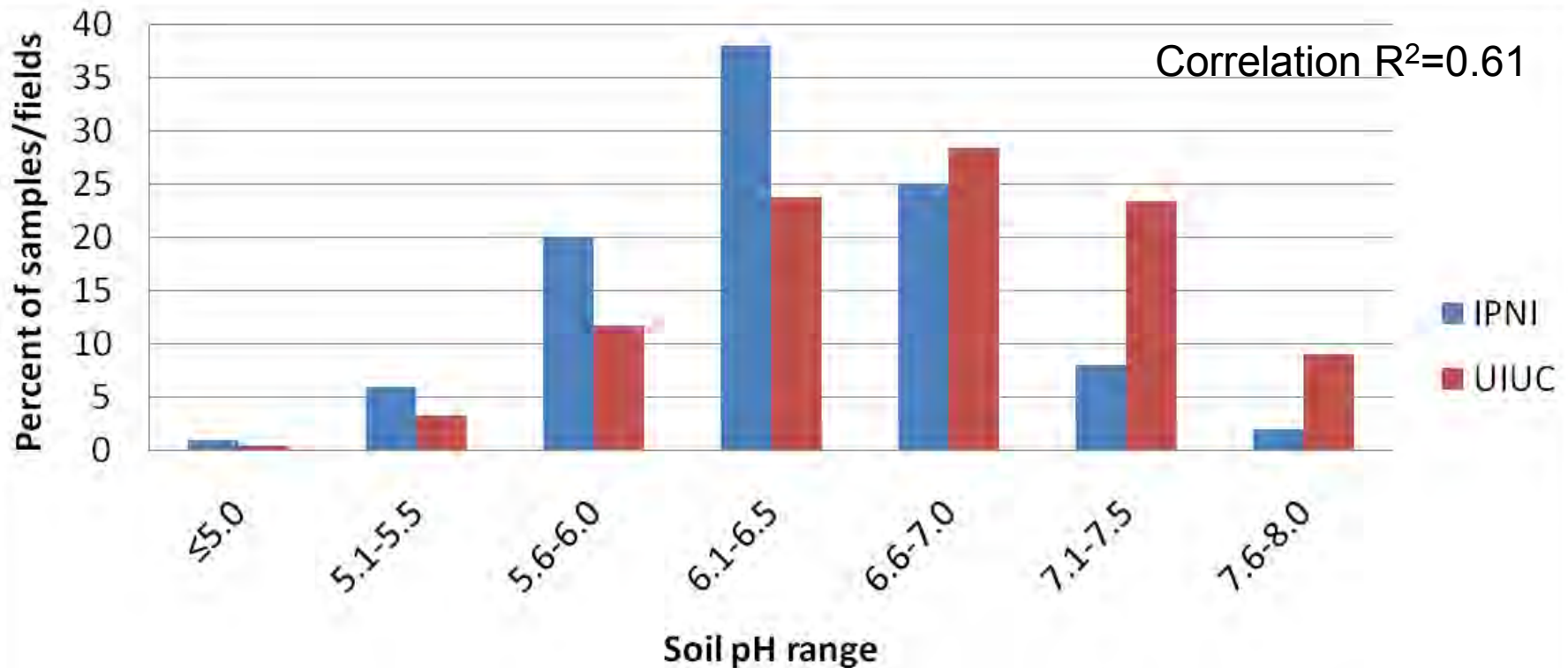
Median Value
IPNI=356 lb/a (298 in 2001)
UIUC=304lb/a



Median Value

IPNI=6.3 (no change 2001-2005)

UIUC=6.7



Two Illinois Soil Surveys

1967-1969 & 2007-2008

- 1967-1969 survey had 1,384 samples collected from corn and soybean fields during the growing season from the 0-6 inch soil depth increment
- 2007-2008 survey had 547 samples collected from corn fields in the fall prior to harvest from the 0-7 inch soil depth increment

Comparison of Frequency Distribution of Soil Test Values for Two Soil Surveys

pH Range	1967-69	2007-08	P Test Range	1967-69	2007-08	K Test Range	1967-69	2007-08
	%	%	lb acre ⁻¹	%	%	lb acre ⁻¹	%	%
≤4.5	0.1	0	≤10	3	1	≤120	3	3
4.6-5.0	2	0.4	11-20	11	4	121-180	12	8
5.1-5.5	12	3	21-30	16	6	181-240	18	19
5.6-6.0	21	12	31-40	15	7	241-300	23	18
6.1-6.5	31	24	41-50	12	10	301-500	30	40
6.6-7.0	22	28	51-100	26	35	501-800	9	9
7.1-7.5	10	23	101-200	12	26	801-1100	3	2
>7.5	3	9	>200	5	10	>1100	3	1

What Is Going On Then?

- If people agree that recommendations are adequate (and even if they believe they should be a little lower or a little higher than what they are), why do we have such high P levels and such low K levels?
 - Too much focus on P and not enough on K
 - People are testing, but not using the information (i.e. I'll apply the same rate as always)

What Does This All Mean?

- Huge opportunity to improve return on the investment
 - Opportunity to save on P (22.5 M. acres)
 - 19% below CL (4.3 M. acres)
 - 22% maintenance (5.0 M. acres)
 - 59% above maintenance (13.3 M. acres)
 - Opportunity to increase yield with K
 - 45% below CL (10.1 M. acres)
 - 24% maintenance (5.4 M. acres)
 - 31% above maintenance (7.0 M. acres)

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