

Soil Test P vs. Total P in Wisconsin Soils

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Introduction

- Soil test P is often measured
 - Little information is available on total P content of soils
 - Why do we care about total P now?
 - Soil total P is a necessary input for the P-index
 - P-index is one option for P-based nutrient management planning
 - Total P is needed to estimate the particulate P component of the P index
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Components of the Phosphorus Index (PI):

$$PI = PP + SP$$

PI = Total P index

PP = Particulate P

SP = Soluble P

Introduction

- Total P analysis is too time consuming and expensive for routine soil testing.
 - Interest in predicting total P from readily available info., such as soil test P.
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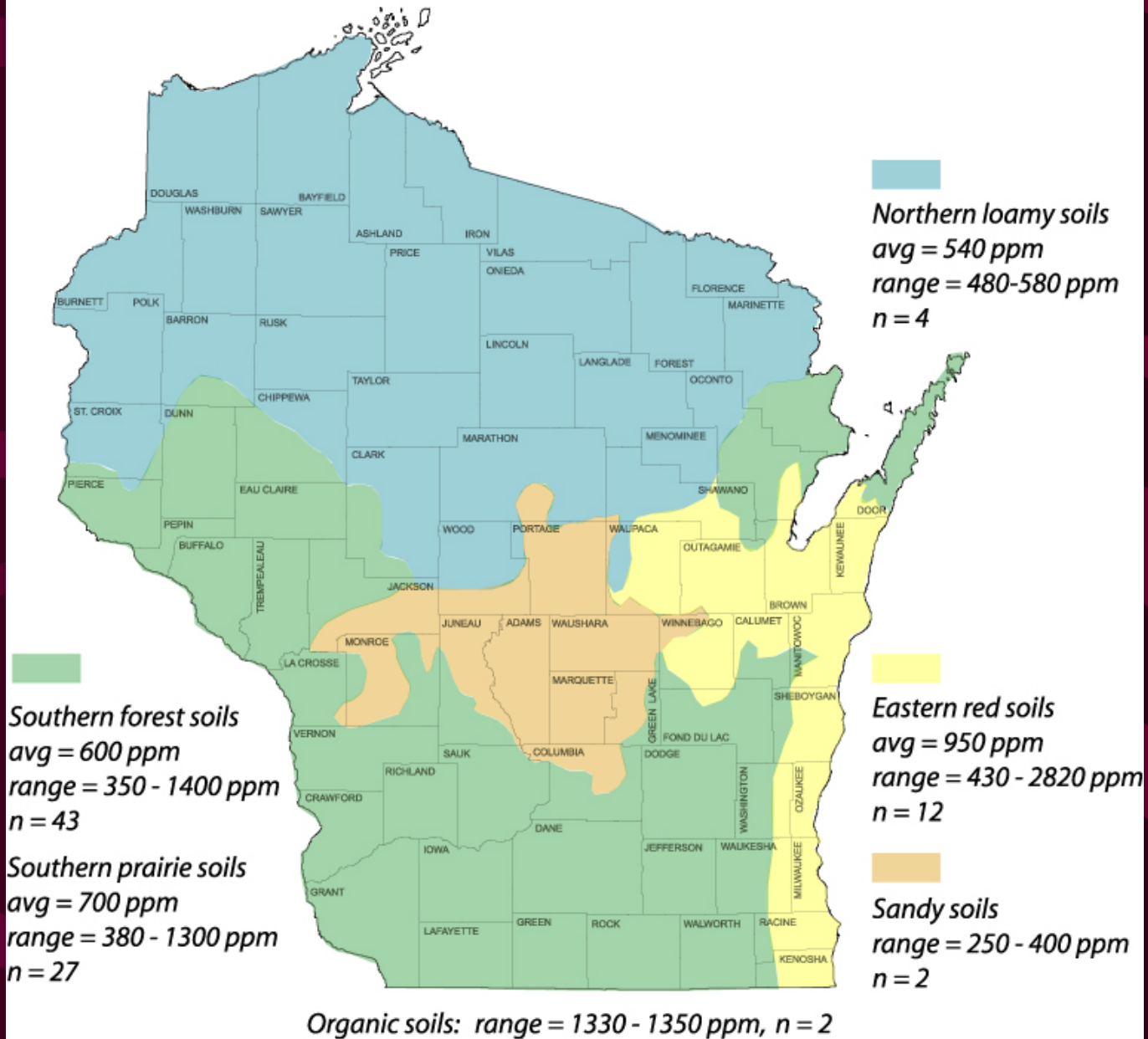
Book Values for Soil Total P

Source	Total soil P	
	%	ppm
Havlin et al., 1999	0.005-0.15	50-1500
Schulte & Walsh, 1998	0.10	1000
Troeh & Thompson, 1993	0.035-0.25	350-2500

Soil P-Total P Comparison

- Total P and Bray soil test P measured on 90 agricultural soil samples selected to represent major soil groups and for geographic distribution.
 - Wisconsin Soil and Plant Analysis Laboratory
 - Bray P-1, and soil total P
 - Other routine tests performed (eg., soil organic matter)
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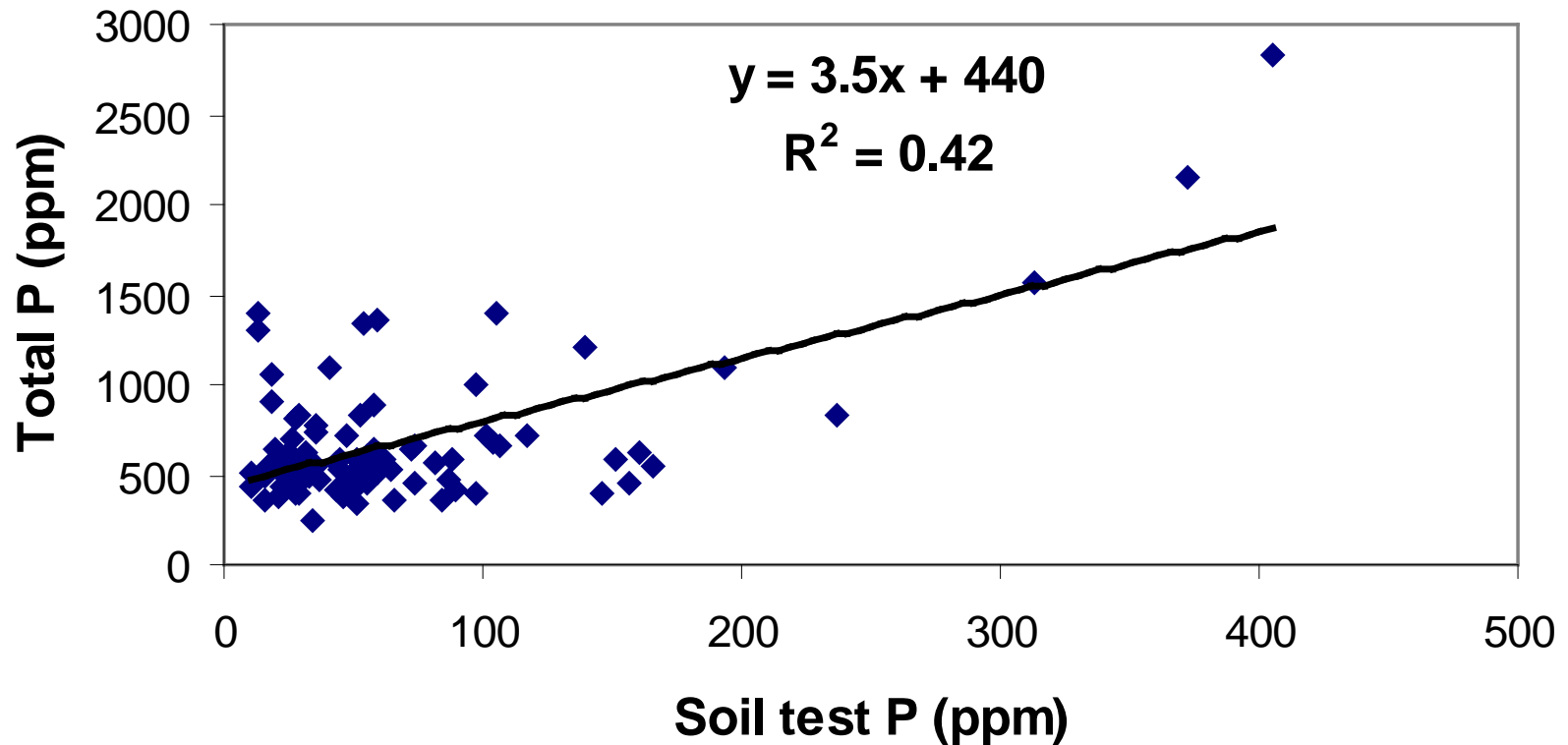
Soil Total P



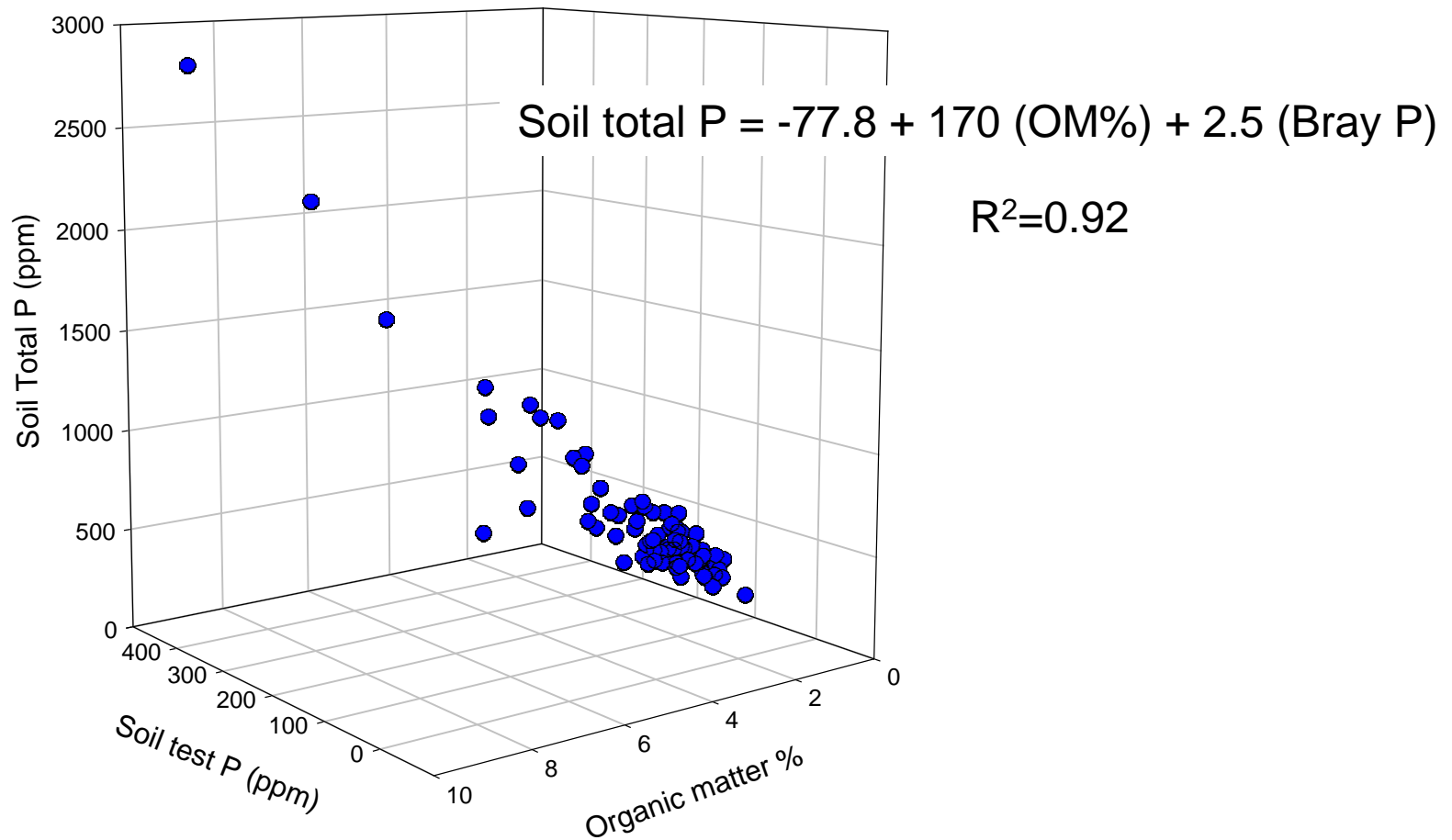
Total Phosphorus Content of Wisconsin Soils

Soil group	No.	Total P	
		Range	Average
		----- ppm P -----	
S. Forest soils	43	350-1400	600
S. Prairie soils	27	380-1300	700
N. Loamy soils	4	480-580	540
E. Red soils	12	430-2820	950
Sandy soils	2	250-400	--
Organic soils	2	1330-1350	--

Soil test P poor predictor of soil total P



Soil test P and percent organic matter together good predictors of soil total P





Particulate P concentrations can be predicted with soil test P and soil organic matter

Summary

- Based on preliminary data, total P in soils can be predicted from Bray P-1 soil test P and soil organic matter content.
 - Soil test P- total soil P relationships will be refined using data from an on-going comparison.
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