

Proficiency Data Methods Comparisons

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Overview

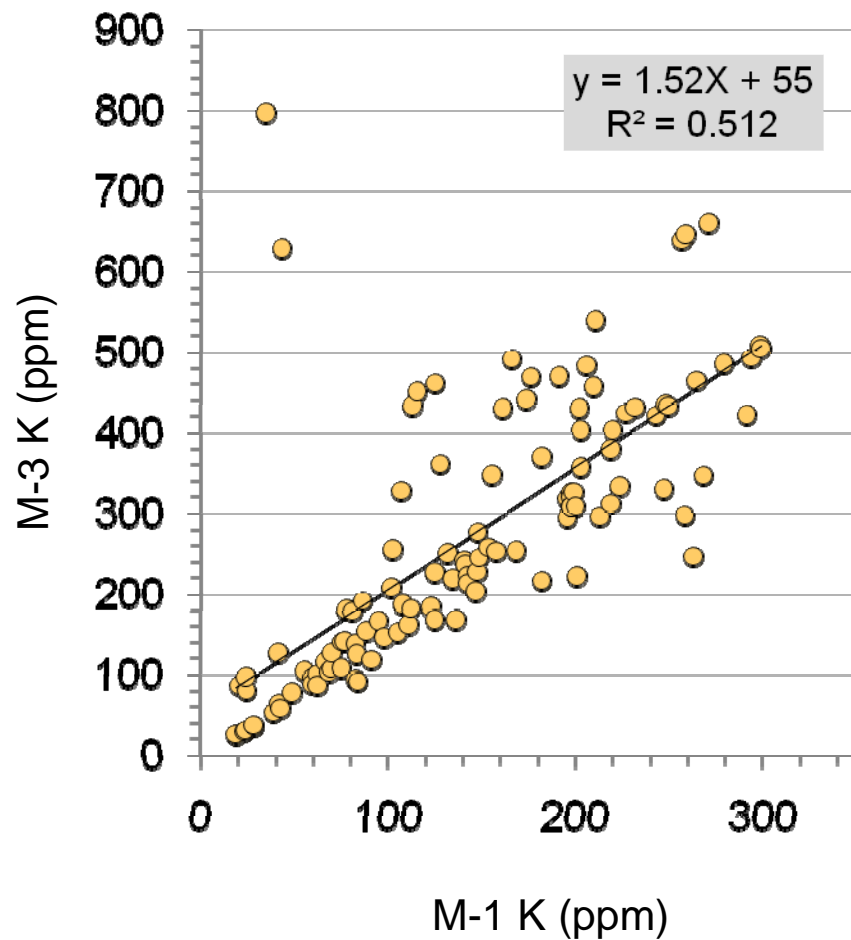
Lab proficiency databases provide insight on:

- Soil Method Comparisons**
- Correlative Soil Properties**
- Method Precision and Uncertainty**

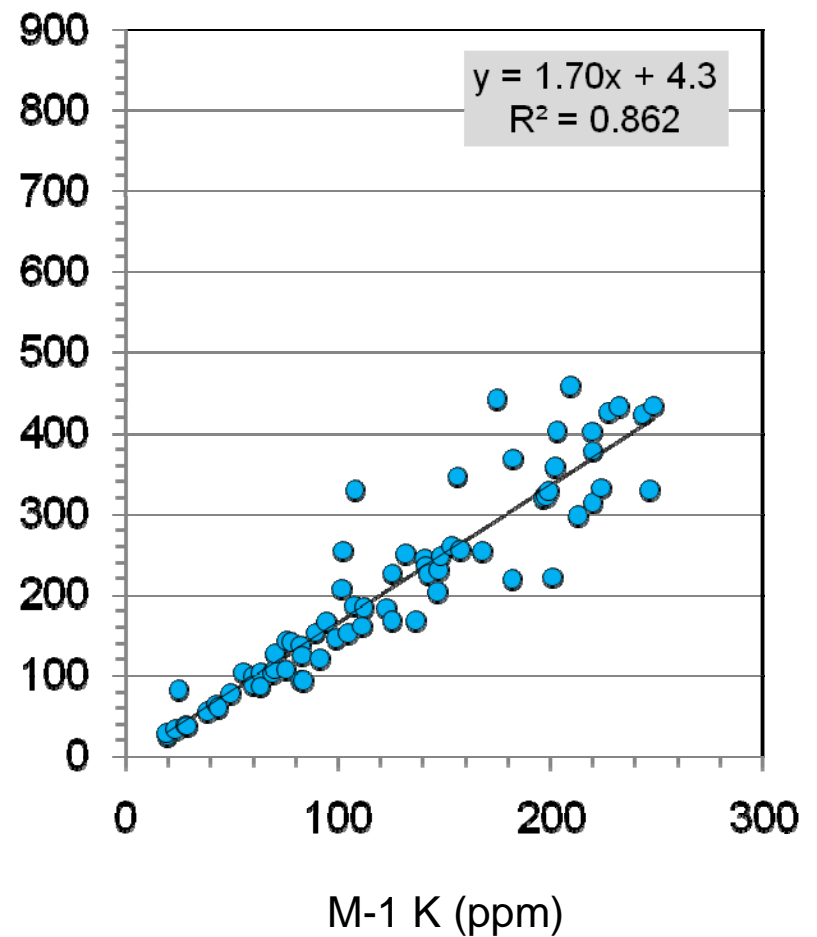
Insight can be employed to improve lab analysis and Test interpretation

Soil Potassium Comparison Mehlich 1 vs Mehlich 3

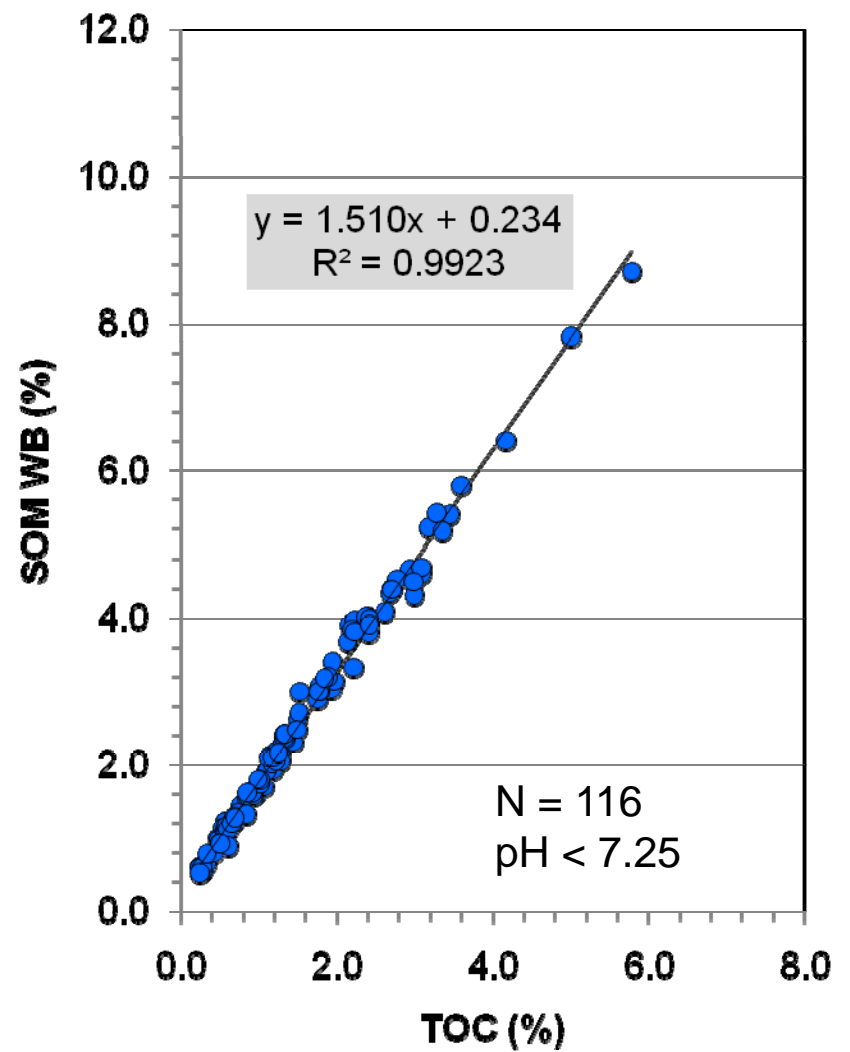
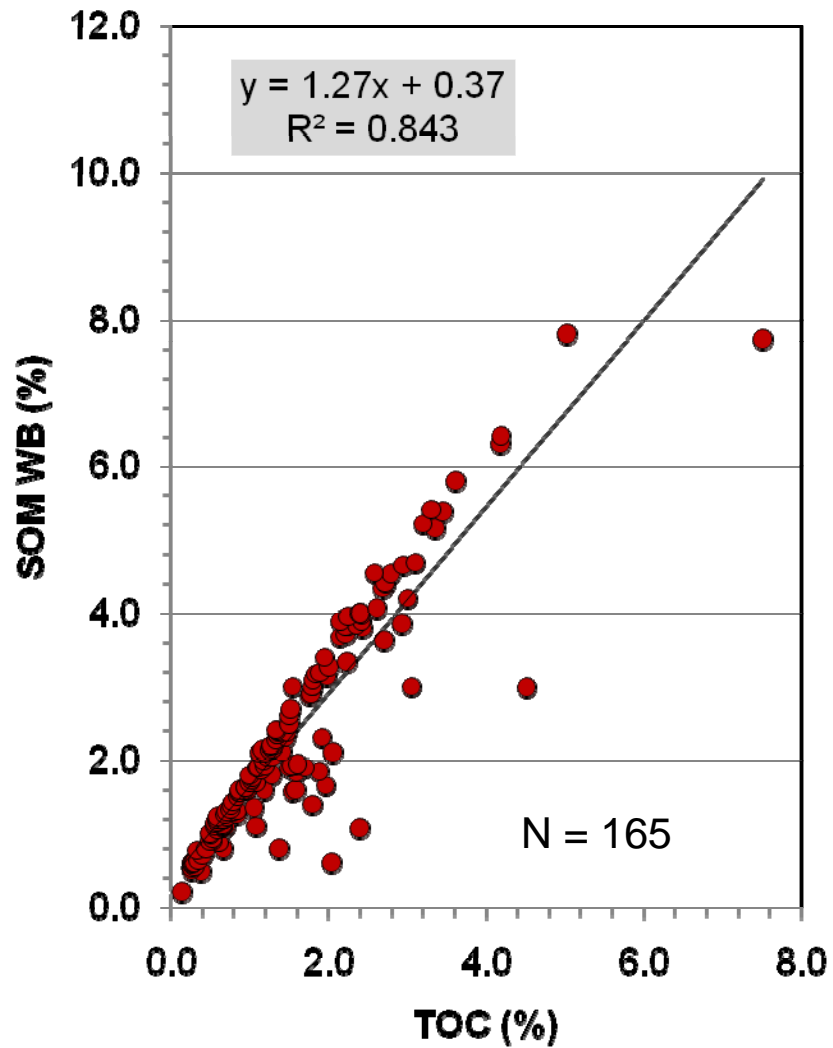
113 Soils, K < 300 ppm



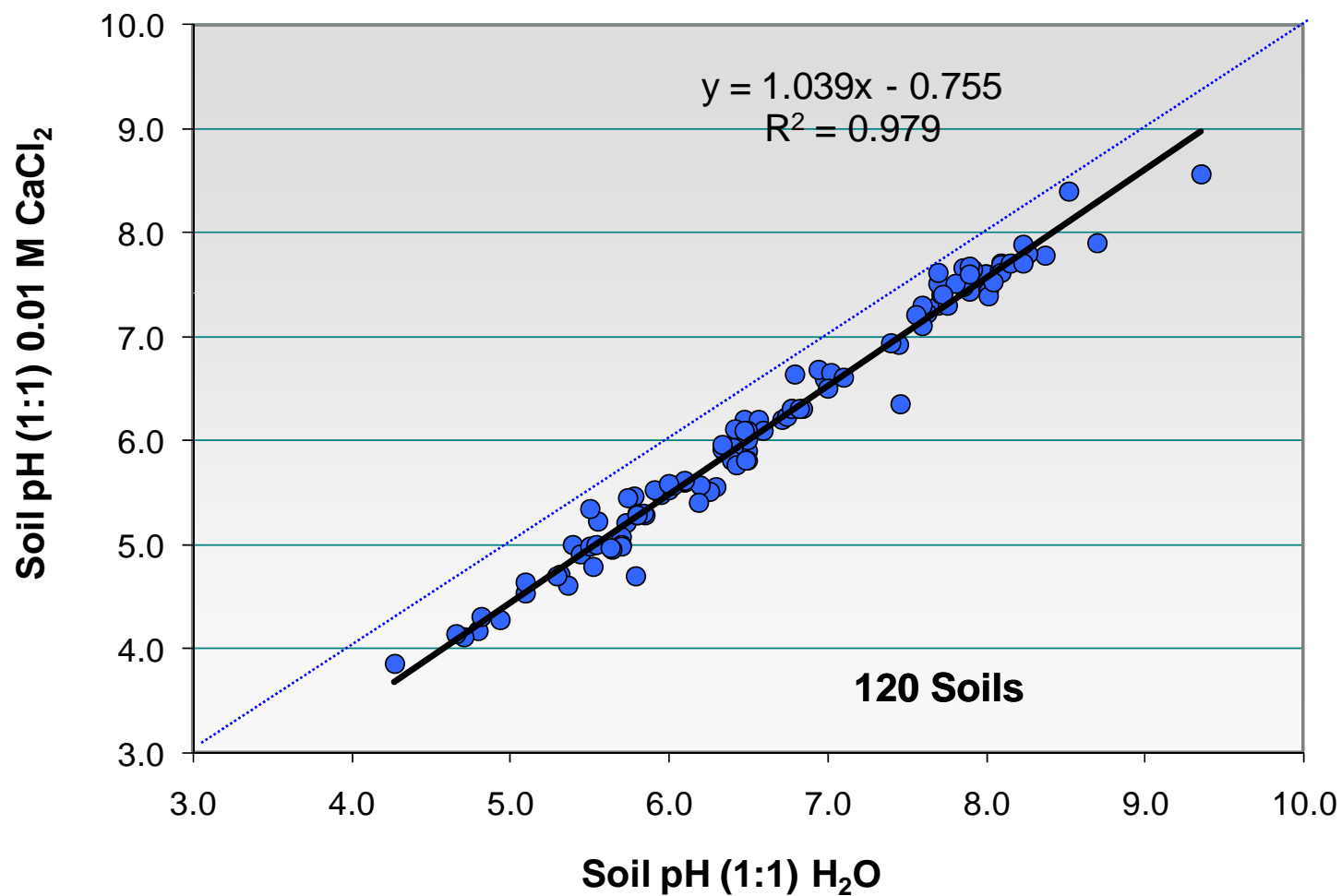
61 Soils, pH < 7.3, K < 250 ppm



SOM and TOC Comparison



Correlation of Soil pH Methods

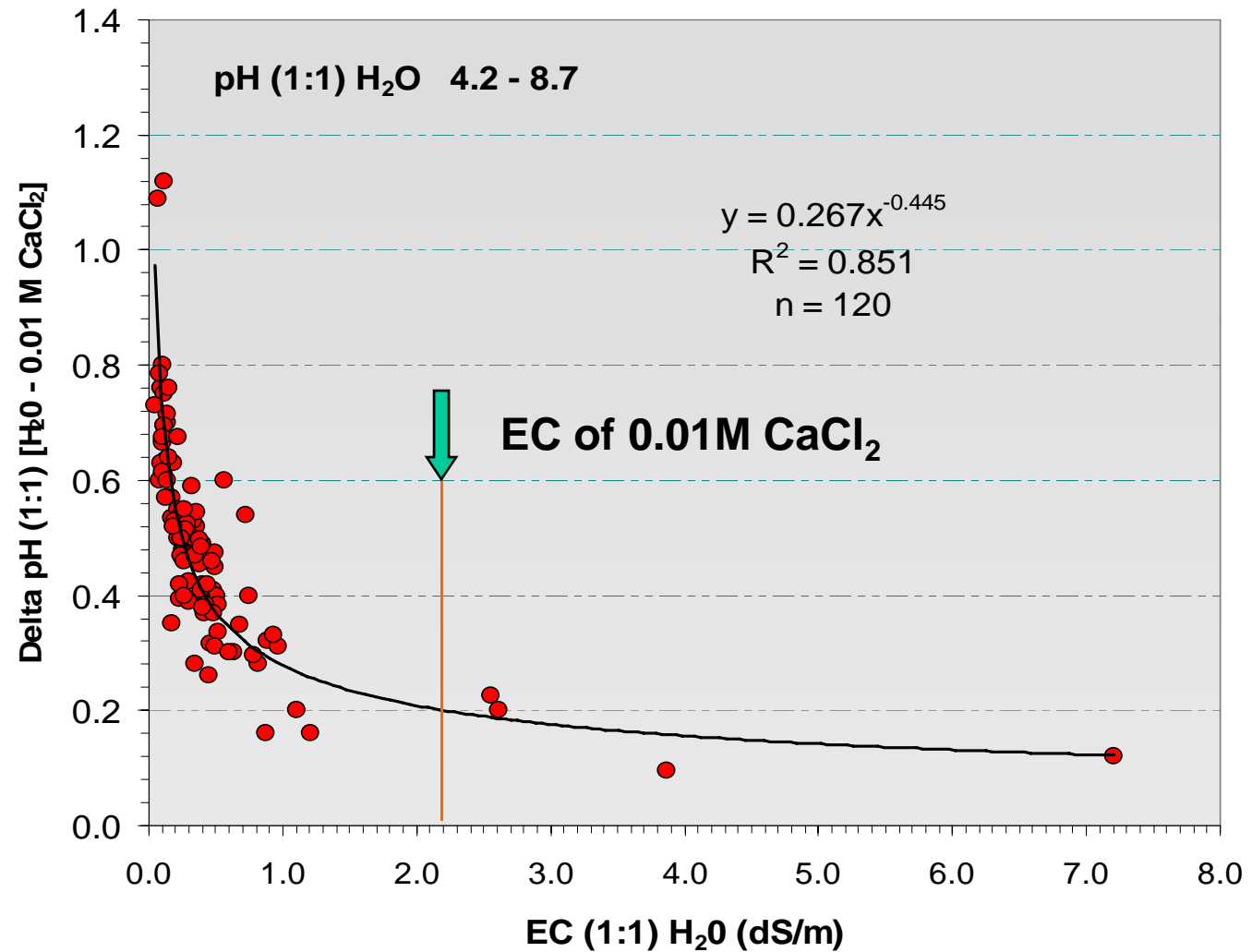


Relationship of pH 1:1 H_2O with Four Soil pH Methods

	Equation	R ²
pH Saturate Paste	$Y = 0.96 \times (\text{pH}_{1:1 w}) + 0.01$	0.992
pH 1:2 H_2O	$Y = 1.00 \times (\text{pH}_{1:1 w}) + 0.12$	0.997
pH 1:1 (0.01 M $CaCl_2$)	$Y = 1.04 \times (\text{pH}_{1:1 w}) - 0.76$	0.979
pH 1:2 (0.01 M $CaCl_2$)	$Y = 1.07 \times (\text{pH}_{1:1 w}) - 0.91$	0.977

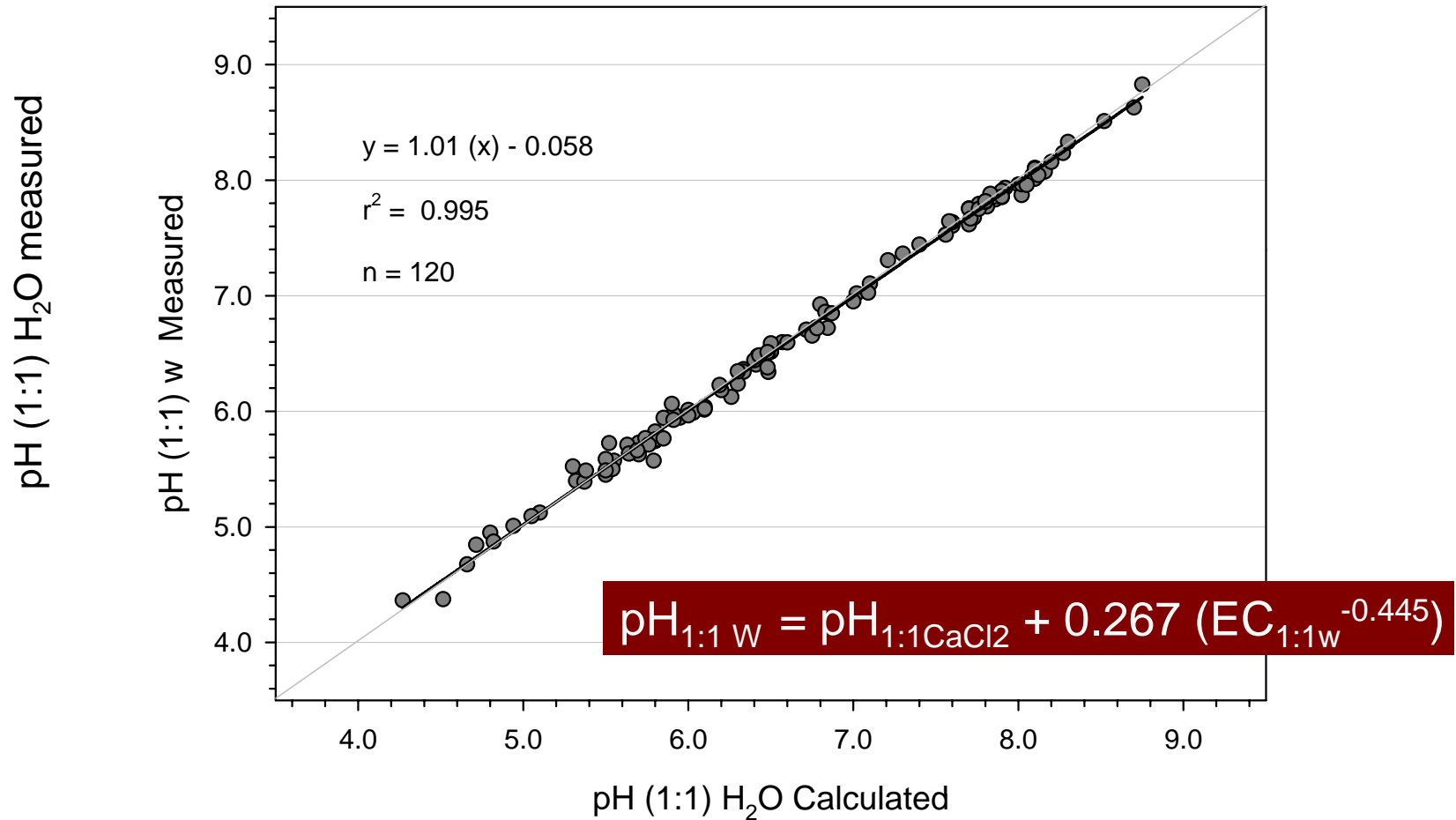
¹ Based on 120 Soils

Comparison of Delta Soil pH vs EC



¹ Based on 120 Soils

Relationship of measured $\text{pH}_{1:1\text{ w}}$ and Calculated ($\text{pH}_{1:1\text{ CaCl}_2}$ and $\text{EC}_{1:1}$)



How good is Method Precision

ALP evaluates the lab bias and method precision

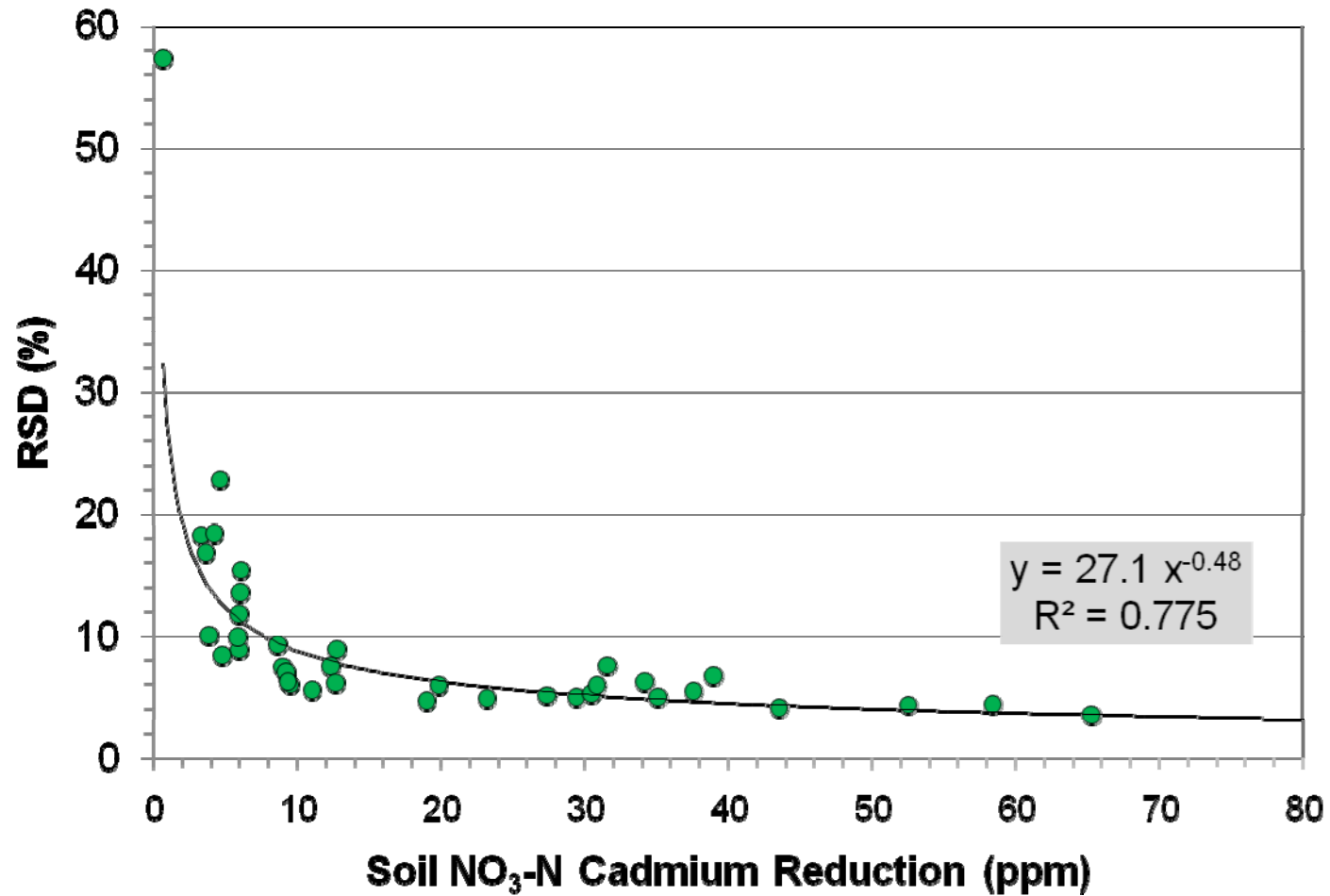
**All soils are analyzed in triplicate
and intra-lab precision is evaluate for each
participating laboratory.**

Mehlich 3 – P Method Precision Summary

P mg/kg	Std (ppm)	Std (ppm)
	SPEC	ICP
5 - 10	0.6 – 2.0	0.8 – 1.5
10 - 20	0.8 – 1.2	0.9 – 1.2
20 - 30	1.2 – 1.6	1.1 – 2.8
30 - 50	0.9 – 2.2	1.4 – 3.2
50 - 80	1.3 – 4.7	1.6 – 6.2
> 80	4.3 – 10.9	4.0 - 6.2

ALP Program, 40 soils, based on 3 reps, 18 labs

Soil NO₃-N Within Lab Precision



¹ ALP Program, 40 Soils 2006 - 2009

Summary

Soil PT data has shown :

- Correlation between Soil K methods**
- SOM –TOC relationships**
- Correlative Model of Soil pH methods
using EC as a co-variable.**
- Establish method performance across multiple
labs**

THANKS

Special thanks to SERA-6 members who have assisted in collecting soils for the ALP Program, 2009

Debbie Jones, University of Tennessee

David Kissel, University of Georgia

Charles Mitchell, University of Auburn

Nancy Wolf, University of Arkansas

Michael Kress, Oklahoma State University

ALP has collected ten soils from the SERA-6 Region.

Soils collected from Georgia, Alabama,

Tennessee, Kentucky, Arkansas,

Oklahoma, Texas and Missouri.

