



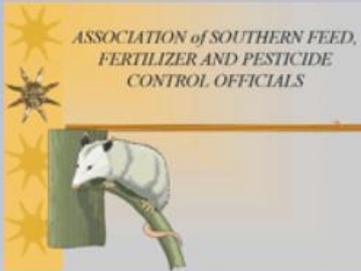
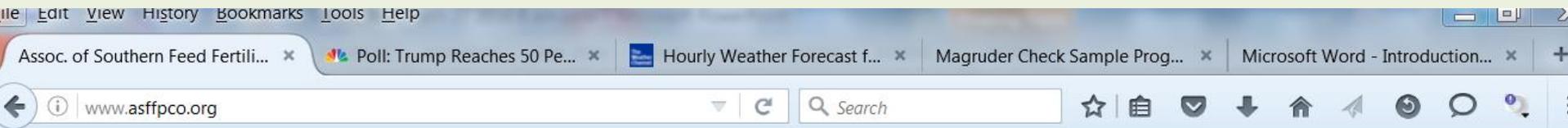
Changes in the Magruder Program For Fertilizer Proficiency Testing

Frank J. Sikora
University of Kentucky
Division of Regulatory Services

MWAOAC – Sioux Falls, SD

April 25 - 27, 2016

www.asffpco.org



The Association of Southern Feed, Fertilizer, and Pesticide Control Officials ASFFPCO



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- [Official Publication No. 68](#) (pdf)
- [2003 Official Publication](#) (pdf)
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Welcome to ASFFPCO

"The objective of the Association is to facilitate education and outreach programs regarding feed, fertilizer and pesticide issues, being of interest to the regulatory control officials and industry representatives, and to promote uniformity in legislation definitions, standards, and rules and regulations governing the enforcement of law relating to the manufacture, sale distribution, and use of feed, fertilizer, and pesticides within the member states." -ASFFPCO Constitution

[Registration](#) (pdf) [Draft Agenda](#) (pdf)

President's Message

Kentucky is looking forward to being your host for the 74th Annual Meeting of the Association of Southern, Feed, Fertilizer and Pesticide Control Officials (ASFFPCO).

200 YEARS OF BOURBON MAKING HISTORY

In Kentucky, buffalo carved a pathway that was followed by America's early pioneers. On the spot where the buffalo migration route crossed the Kentucky River, we've been making legendary bourbon whiskey for over 200 years. Buffalo Trace is the oldest continuously operating distillery in America. During Prohibition the distillery was even permitted to remain operational, to make whiskey for "medicinal purposes".

In tribute to the mighty buffalo and the rugged, independent spirit of the pioneers who followed them westward, we created Buffalo Trace Kentucky Straight Bourbon Whiskey.

Within the past decade, Buffalo Trace has won more awards than any other distillery in the world, including an unmatched seven "Distillery of the Year" titles. Still American family owned and located in Franklin County, Kentucky, the distillery's rich history includes such legendary distillers as E.H. Taylor, Jr, George T. Stagg, Albert B. Blanton, Orville Schupp and Elmer T. Lee. The distillery sprawls impressively over 130 acres and is home to four centuries of architecture - all still fully operational.

CONTINUE THE JOURNEY



TOUR THE DISTILLERY WEBSITE

Topics to cover

- Web site



- Z scores

$$Z = \frac{\text{Lab value} - \text{avg}}{1.34 \%}$$

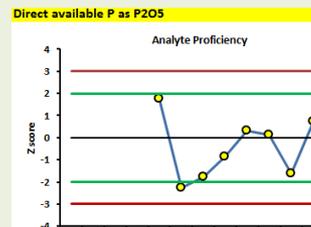
- Robust Statistics

capable of performing without failure under a wide range of conditions

- Lab Report Cards

Proficiency Testing For 16 Analytes								Issue Date : 09/30/2015		
Analyte Group	Analyte Group (Units)	Lab 0494 Data		Analyte Values				Magruder	Lab 0494	
		Value	range	Rob Mean	Rob SD	R-bar	# Tests	Z Score	Method	Flag
010	Total Nitrogen (25%)	24.43	0.0100	23.68	0.9339	0.2910	66	0.79	010.60	0
050	Soluble Potassium as K ₂ O (15%)	14.83	0.9200	15.08	0.6334	0.2445	80	-0.39	050.00	0
101	Acid Soluble Calcium (%)	0.0177	0.0025	0.0227	0.0113	0.0122	13	-0.45	101.33	0
121	Acid Soluble Magnesium (0.1%)	0.3326	0.0651	0.3601	0.0211	0.0185	50	-1.31	121.33	0
148	Total Sulfur (0.13%)	0.3504	0.0599	0.2921	0.0654	0.0222	29	0.89	148.07	0

- Control Charts



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check sample program

STRIVING FOR EXCELLENCE IN ANALYSIS

 **Lab Portal**

Introduction	Method Codes	Data Entry Instructions Training Videos	Statistical Reports Overview Quick Reference Guide Analyte Report Cards	FAQs on DLs	Contacts
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2016 Samples and Reports

JAN 2016 160111 Micros analyte report method report	FEB 2016 160211 24-25-4 analyte report method report	MAR 2016 160311 Biosolids analyte report method report	APR 2016 160411 Liquid ThioS analyte report method report	MAY 2016 160511 Urea analyte report method report	MAY 2016 160512 Micros analyte report method report	JUN 2016 160611 WS 25-5-15 analyte report method report
JUL 2016 160711 12-12-12+micros analyte report method report	AUG 2016 160811 Liquid Organic analyte report method report	SEP 2016 160911 MAP analyte report method report	OCT 2016 161011 MOP analyte report method report	OCT 2016 161012 ZnSO4 analyte report method report	NOV 2016 161111 32-0-10 analyte report method report	DEC 2016 161211 Coated N-P-K analyte report method report

MAGRUDER METHOD CODES (ver 021415)

There are many more additional method codes in the new program listed in the table below. The additional codes provide greater specificity on the methods used. The new codes are shown in the first column with a cross reference to the old code, if available, in the last column. The text that appears in a drop down box for selection on the data reporting web site is shown in the column entitled "Method Description". The column entitled "Further Method Description" describes further method details not present in "Method Description". If a single AOAC reference is available describing the method from preparation to detection, the reference is provided in the "AOAC reference" column. Hybrid methods with preparation by one method and detection by another method are provided in "Further Method Description" column.

IT IS VERY IMPORTANT you report the appropriate method code that describes the method you used. This will ensure accurate data collection for comparing results from various methods for an analyte.

Method Code	Analyte	Method Description	Unit	AOAC Reference	Further Method Description	Old Method Code
001.10	Ammoniacal Nitrogen	Magnesium Oxide Method	%	920.05		001.10
001.99	Ammoniacal Nitrogen	Other	%			001.99
002.10	Nitrate Nitrogen	Robertson	%	930.01		002.10
002.20	Nitrate Nitrogen	Jones Modified	%	930.02		002.20
002.99	Nitrate Nitrogen	Other	%			002.99
003.10	Water Insoluble Nitrogen	Method I	%	945.01		003.10
003.20	Water Insoluble Nitrogen	Method II (Katz)	%	970.04		003.20
003.99	Water Insoluble Nitrogen	Other	%			003.99
004.00	Nitrogen Activity Index	Urea-Formaldehyde Compounds	%	955.05		004.00
005.00	Urea Nitrogen	Urease (as N)	%	959.03		005.00
005.99	Urea Nitrogen	Other	%			005.99
006.00	Biuret Nitrogen	AA (as N)	%	976.01		006.00
006.10	Biuret Nitrogen	Spectrophotometric (as N)	%	960.04		006.10
006.99	Biuret Nitrogen	Other	%			006.99
007.00	Urea	Urease (as Urea)	%	959.03		007.00
007.99	Urea	Other	%			007.99

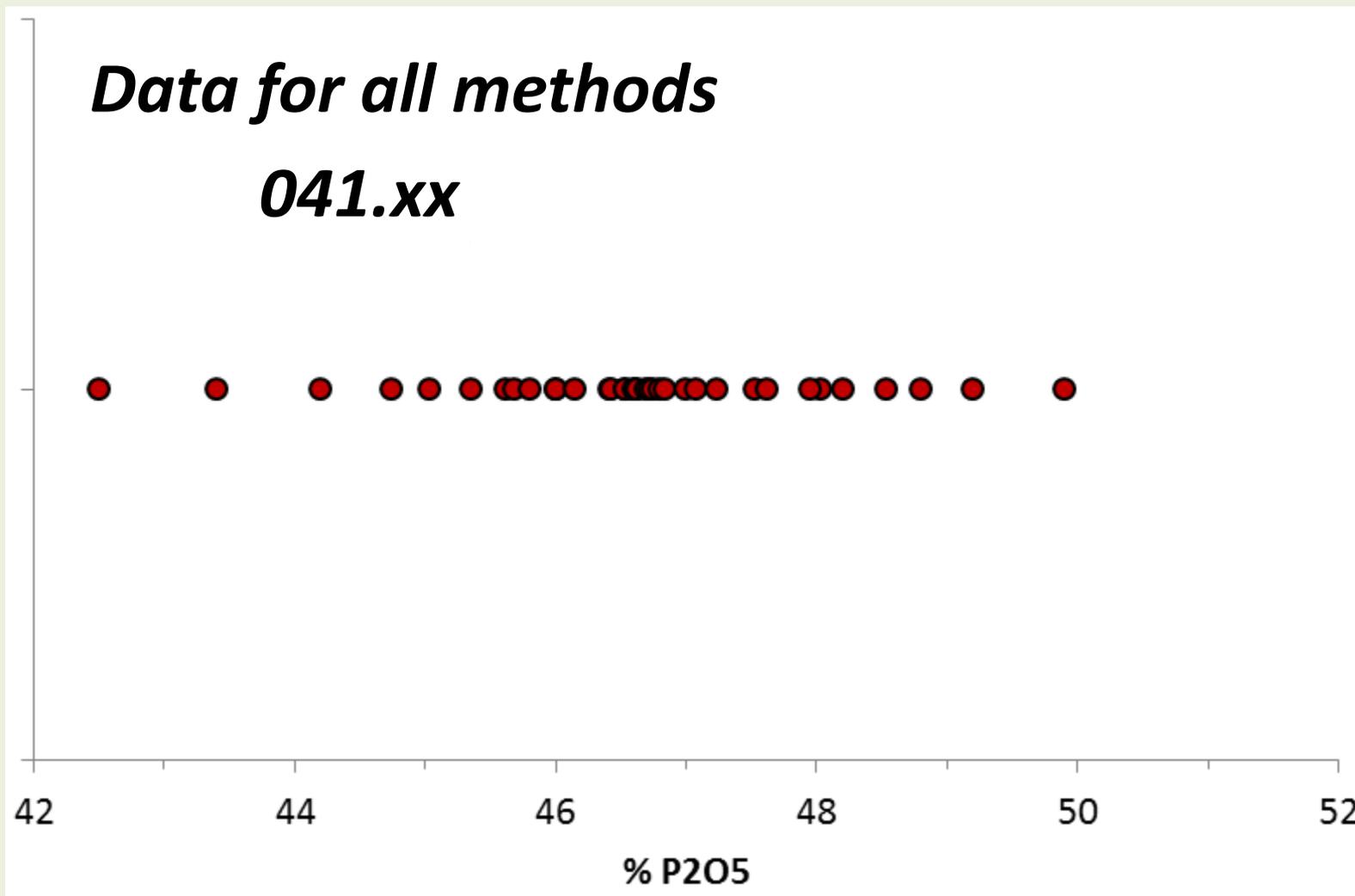
**INTERNATIONAL
STANDARD**

**ISO
13528**

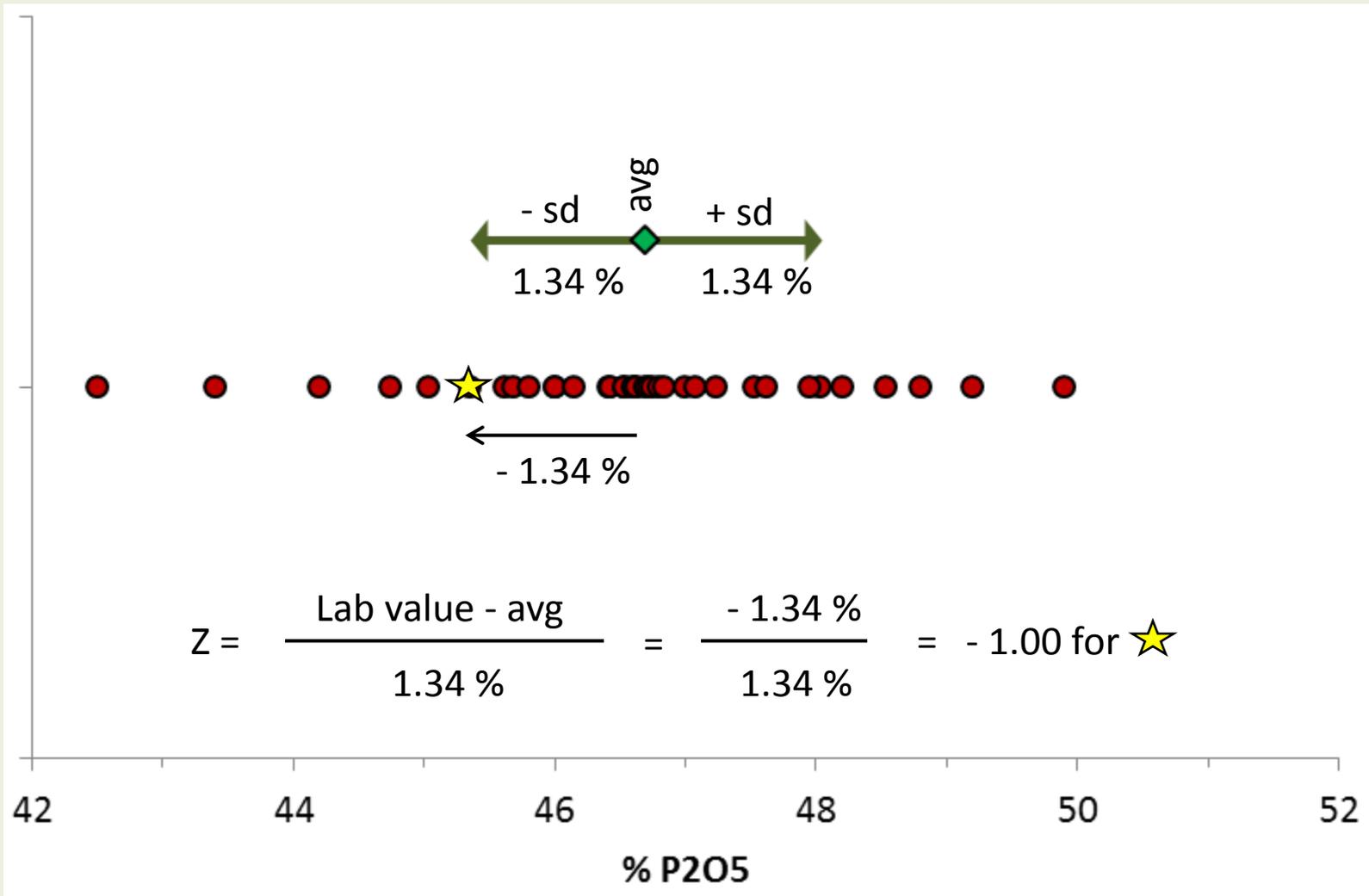
Second edition
2015-08-01

**Statistical methods for use
in proficiency testing by
interlaboratory comparison**

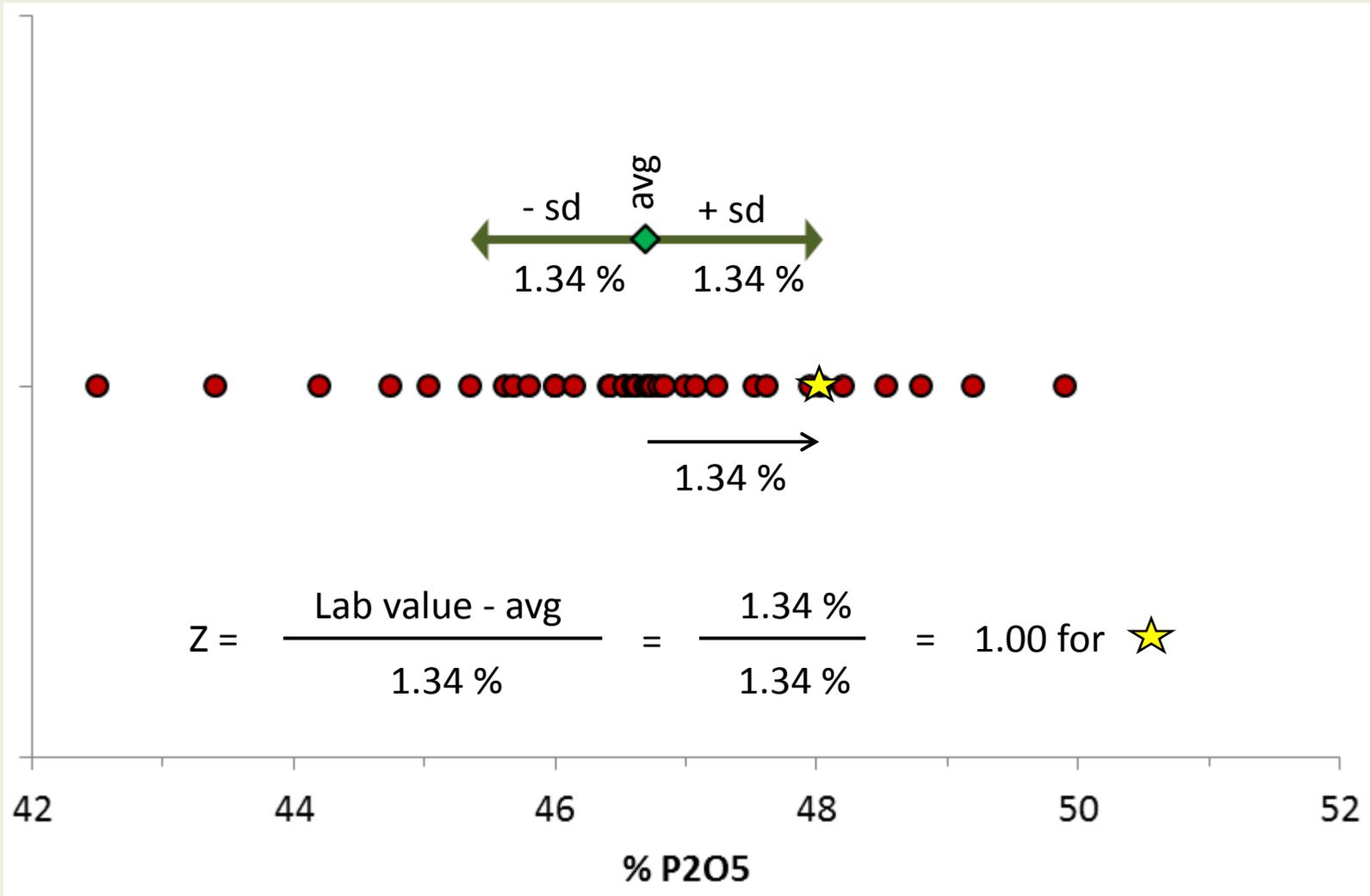
Lab values for direct available P₂O₅ in DAP



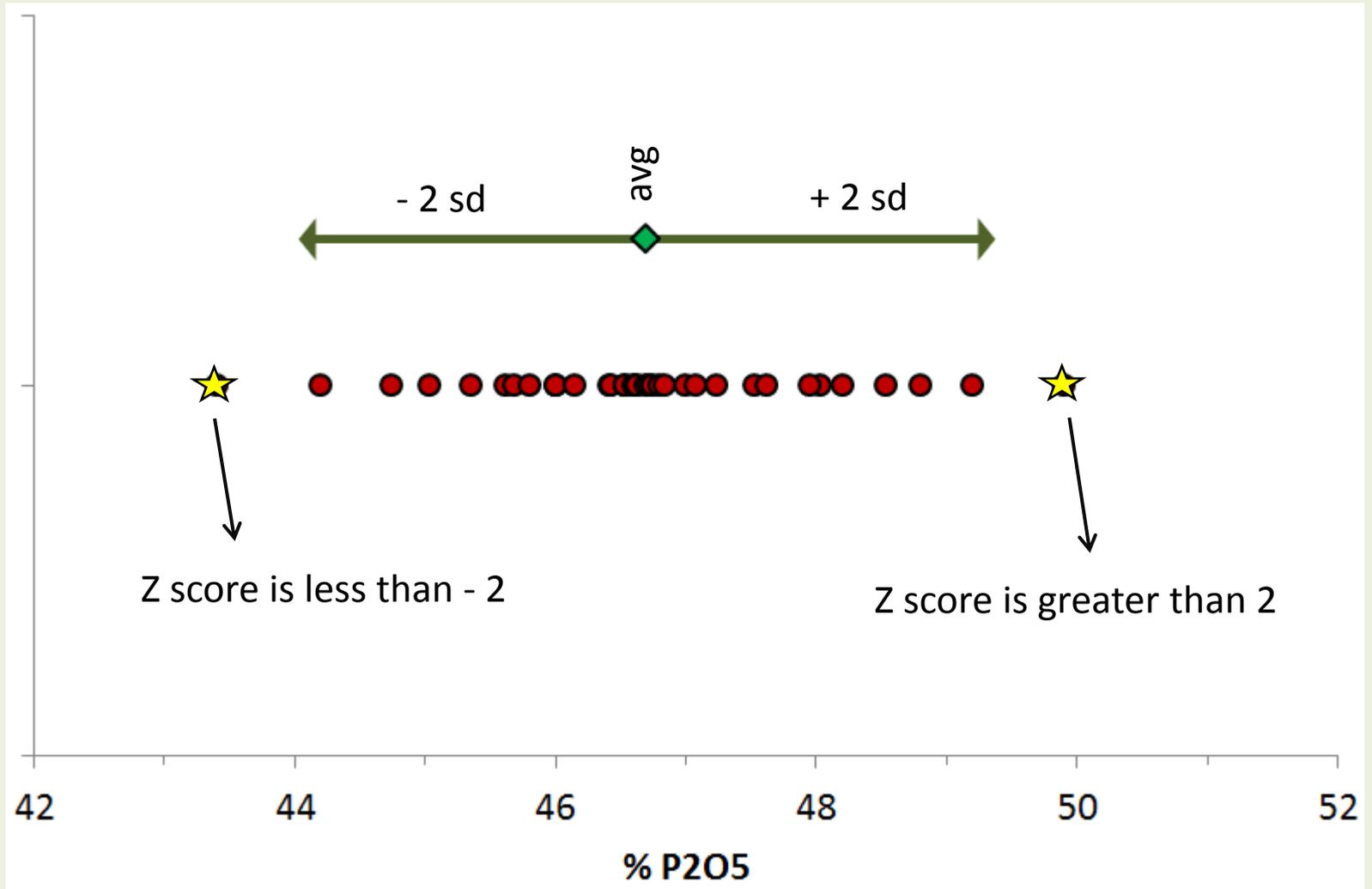
Determining Z score



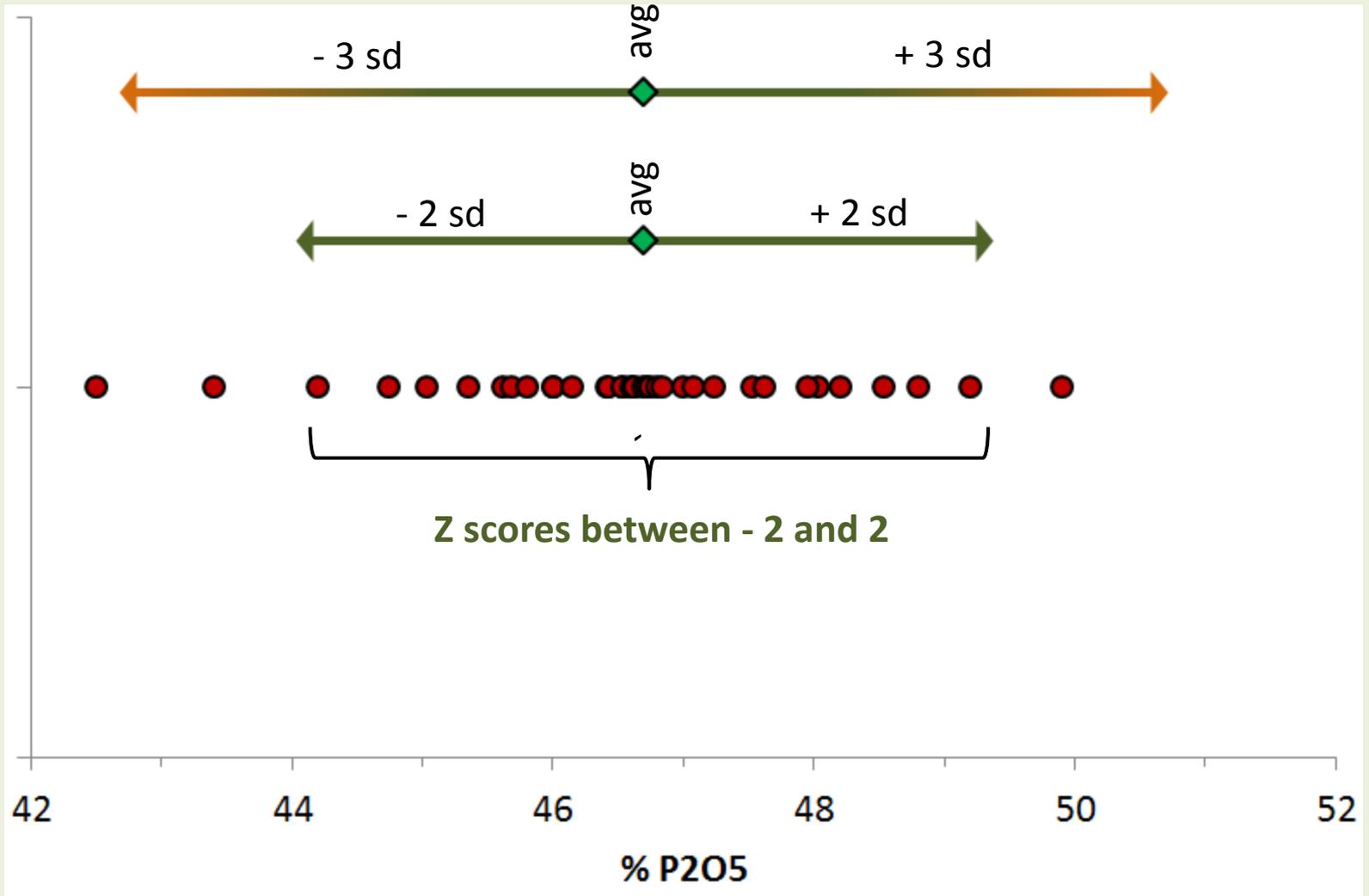
Determining Z score



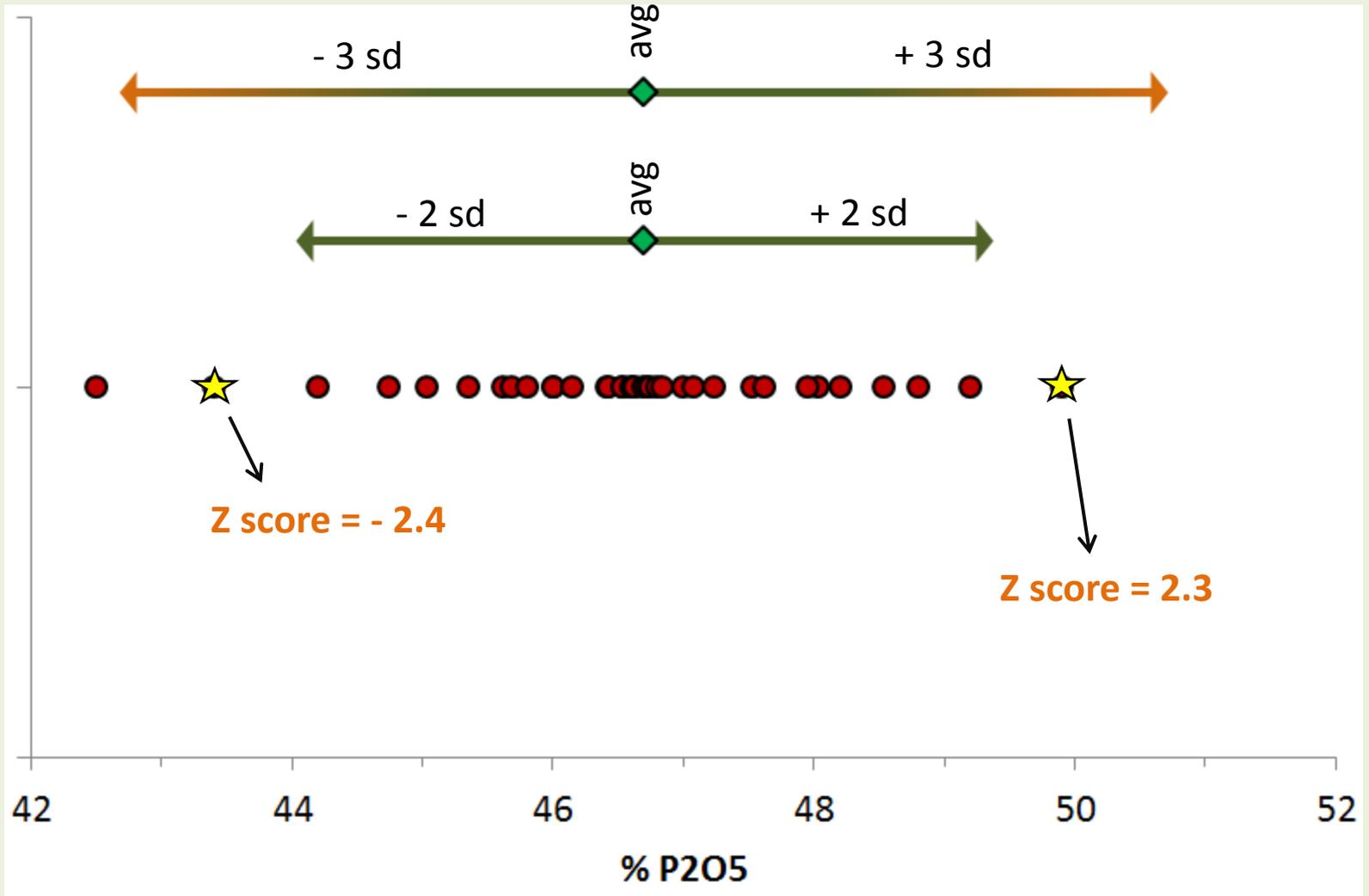
Determining Z score



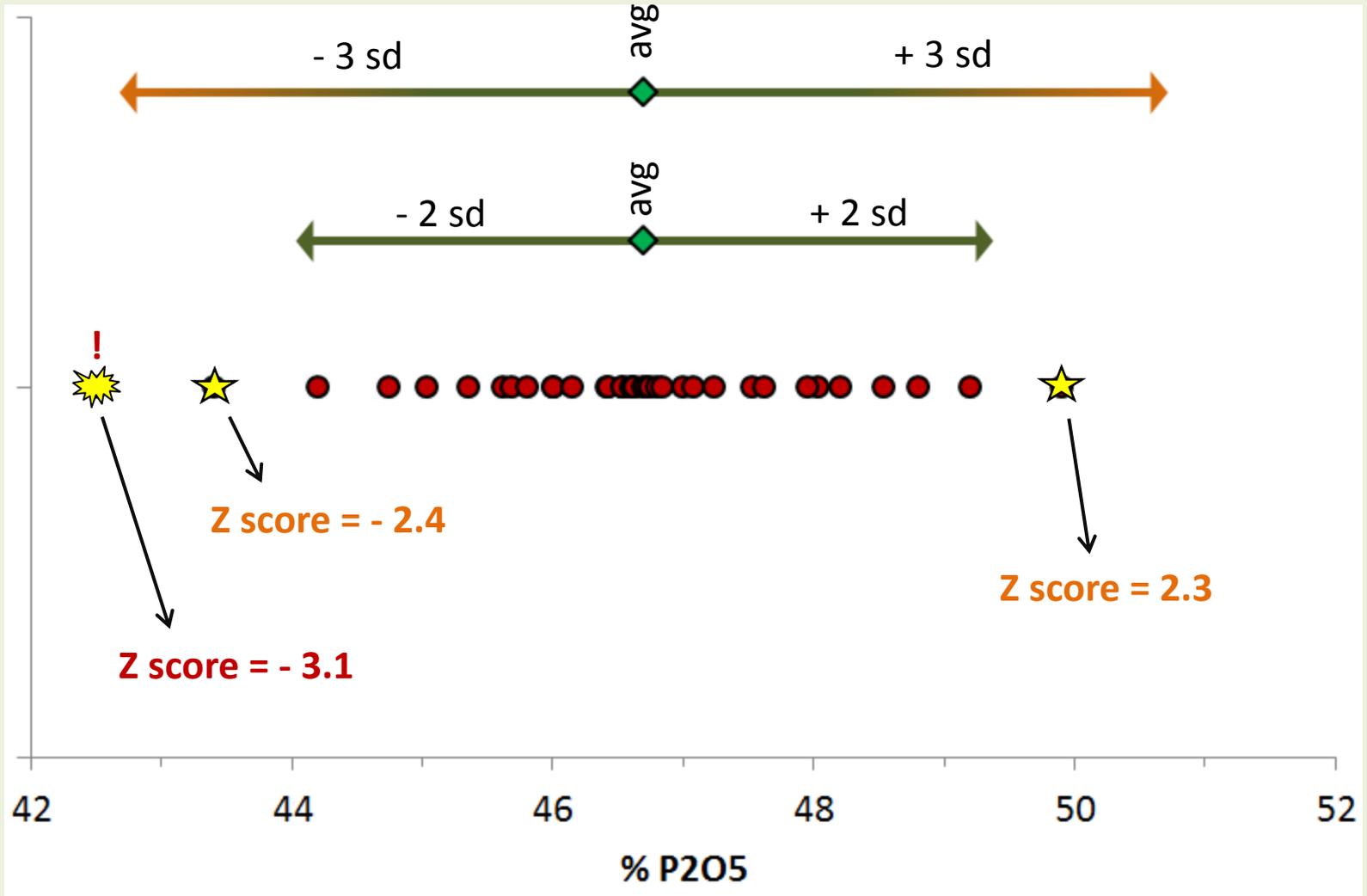
Determining Z score



Determining Z score



Determining Z score



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Sample # 150711: Grade 3-8-8

Analyte Report Card for Lab Code 0494

STRIVING FOR EXCELLENCE IN ANALYSIS

Proficiency Testing For 18 Analytes

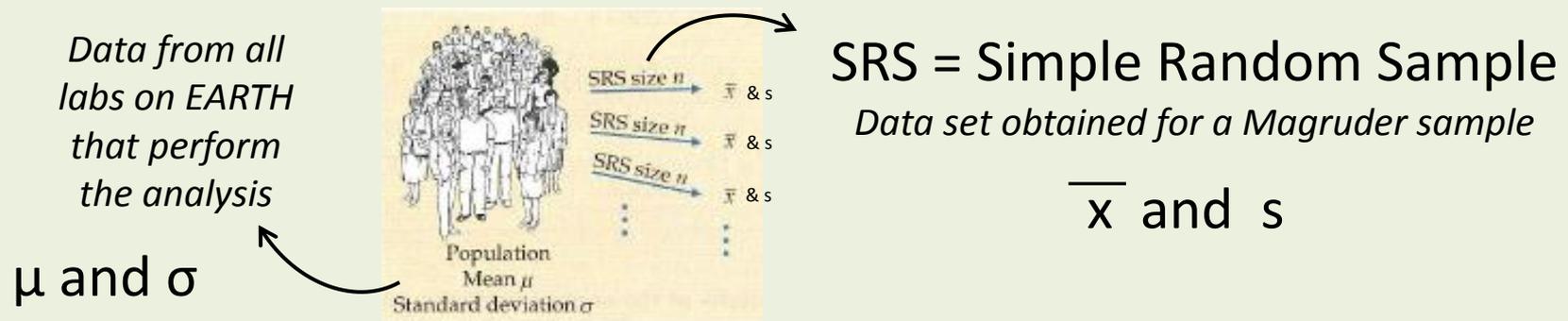
Issue Date : 08/31/2015

Analyte Group	Analyte Group (Units)	Lab 0494 Data		Analyte Values				Magruder	Lab 0494	Flag
		Value	range	Rob Mean	Rob SD	R-bar	# Tests	Z Score	Method	
010	Total Nitrogen (3%)	4.350	0.0000	4.299	0.1060	0.0529	72	0.48	010.60	0
041	Direct Available Phosphorus as P2O5 (8%)	11.08	0.0700	10.53	1.469	0.1047	43	0.37	041.10	0
050	Soluble Potassium as K2O (8%)	[7.380]	0.2800	8.324	0.4679	0.1240	82	-2.02	050.00	0
101	Acid Soluble Calcium (%)	11.33	0.2791	11.64	0.4103	0.2752	15	-0.76	101.33	0
121	Acid Soluble Magnesium (3%)	3.974	0.6061	3.738	0.1995	0.0826	51	1.19	121.33	1
148	Total Sulfur (%)	8.233	0.3881	7.993	0.6911	0.1541	15	0.35	148.07	0
151	Acid Soluble Arsenic (ppm)	0.6762	0.0687	0.4662	0.4109	0.0357	5	0.51	151.33	0
181	Acid Soluble Cadmium (ppm)	0.0338	0.0004	0.5290	0.9309	0.2616	4	-0.53	181.33	0
191	Acid Soluble Chromium (ppm)	106.4	3.580	104.3	10.99	4.984	18	0.20	191.33	0
202	Acid Soluble Cobalt (ppm)	2.490	0.1183	2.231	0.4601	0.1670	13	0.56	202.33	0
221	Acid Soluble Copper (%)	0.0005	0.0000	0.0009	0.0005	0.0019	18	-0.75	221.33	0
241	Acid Soluble Iron (%)	0.0743	0.0041	0.0679	0.0117	0.0028	16	0.54	241.33	0
251	Acid Soluble Lead (ppm)	0.2561	0.0405	13.92	27.25	8.218	4	-0.50	251.33	0
261	Acid Soluble Manganese (%)	0.0032	0.0001	0.0029	0.0003	0.0002	10	0.96	261.35	0
289	Acid Soluble Molybdenum (ppm)	9.177	0.3245	8.798	1.302	0.5209	13	0.29	289.33	0
291	Acid Soluble Nickel (ppm)	57.47	2.179	57.58	5.413	2.587	19	-0.02	291.33	0
311	Sodium (%)	0.5072	0.0020	0.5238	0.0264	0.0077	6	-0.63	311.33	0
321	Acid Soluble Zinc (%)	0.0074	0.0005	0.0072	0.0019	0.0017	30	0.08	321.33	0

Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). Flags indicate data usage: 0 = Used, 1 = rejected for duplicates too far apart, 2 = rejected as extreme outlier and a 4 flag indicates rejected due to 0 value/s submitted. Robust statistics not used if < 6 labs reporting, in this case the Z Scores are included for information only (Grey). Square brackets indicate that [your value] is lower than the Robust Analyte value less the Investigational Allowance. Method or Analyte codes in light green indicate a guaranteed analyte. Individual lab values may be below detection limits but are reported solely for the purpose of this Proficiency Testing program.

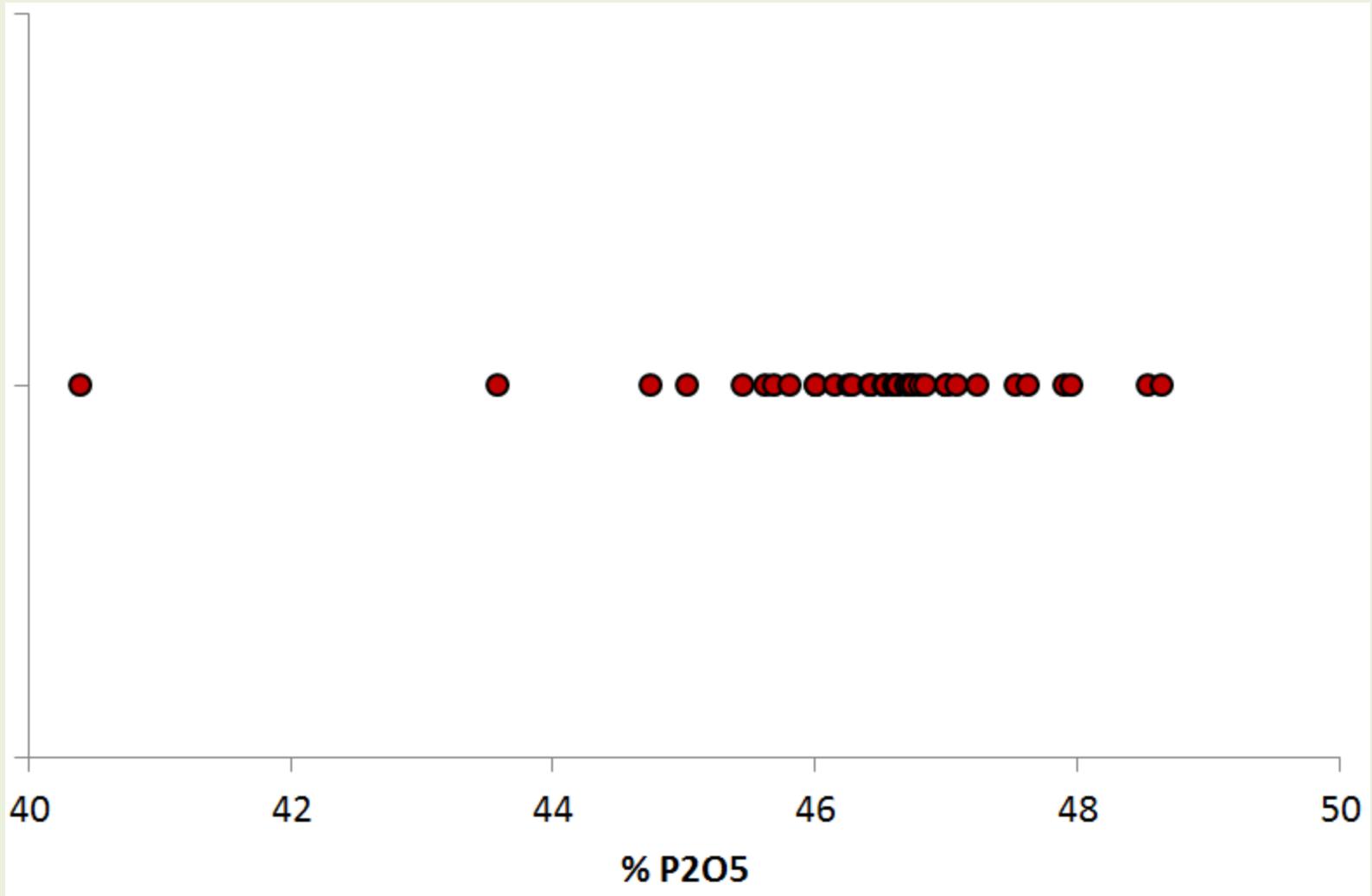
- **Robust:** capable of performing without failure under a wide range of conditions

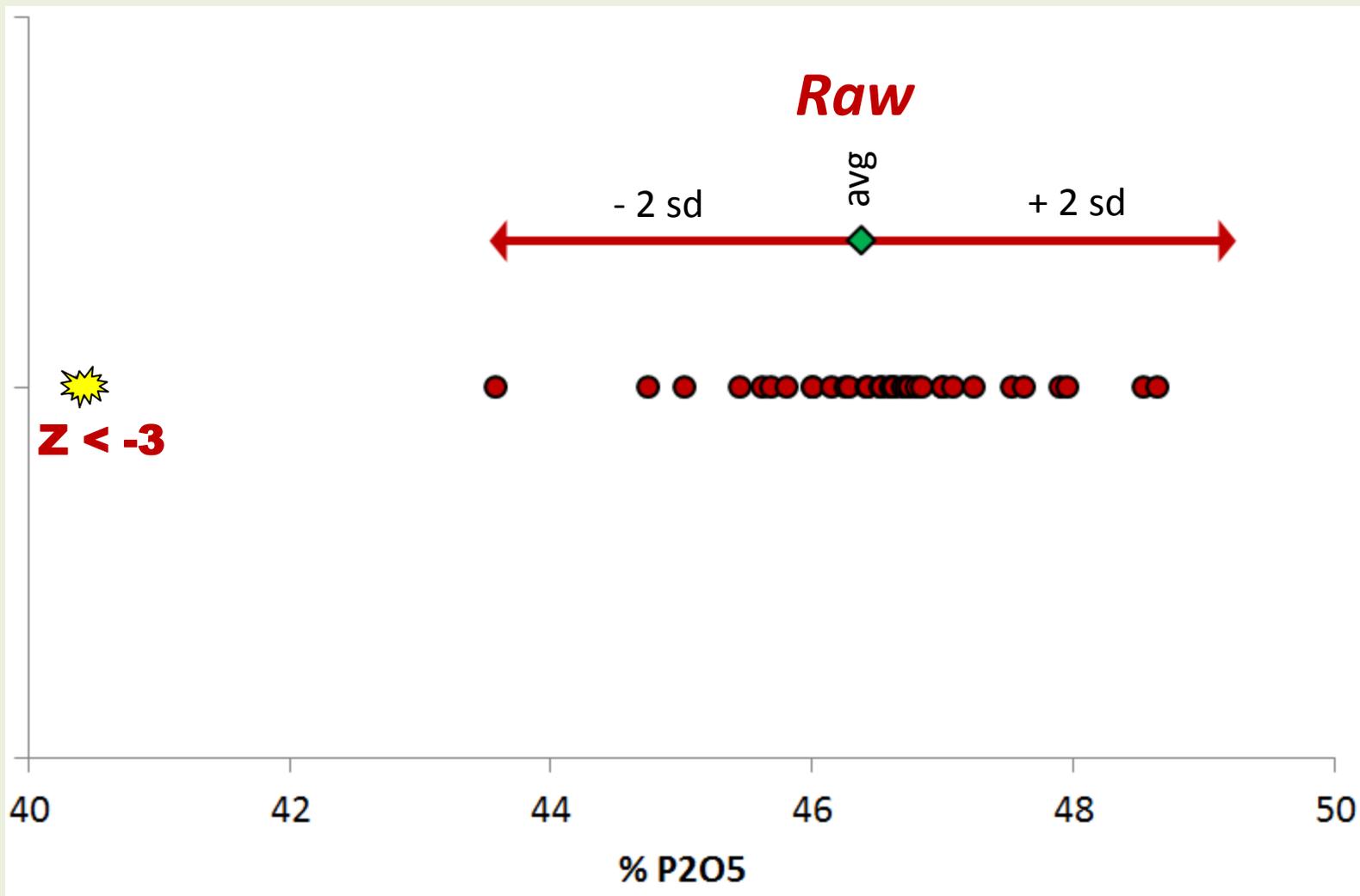
- **Robust Statistics**

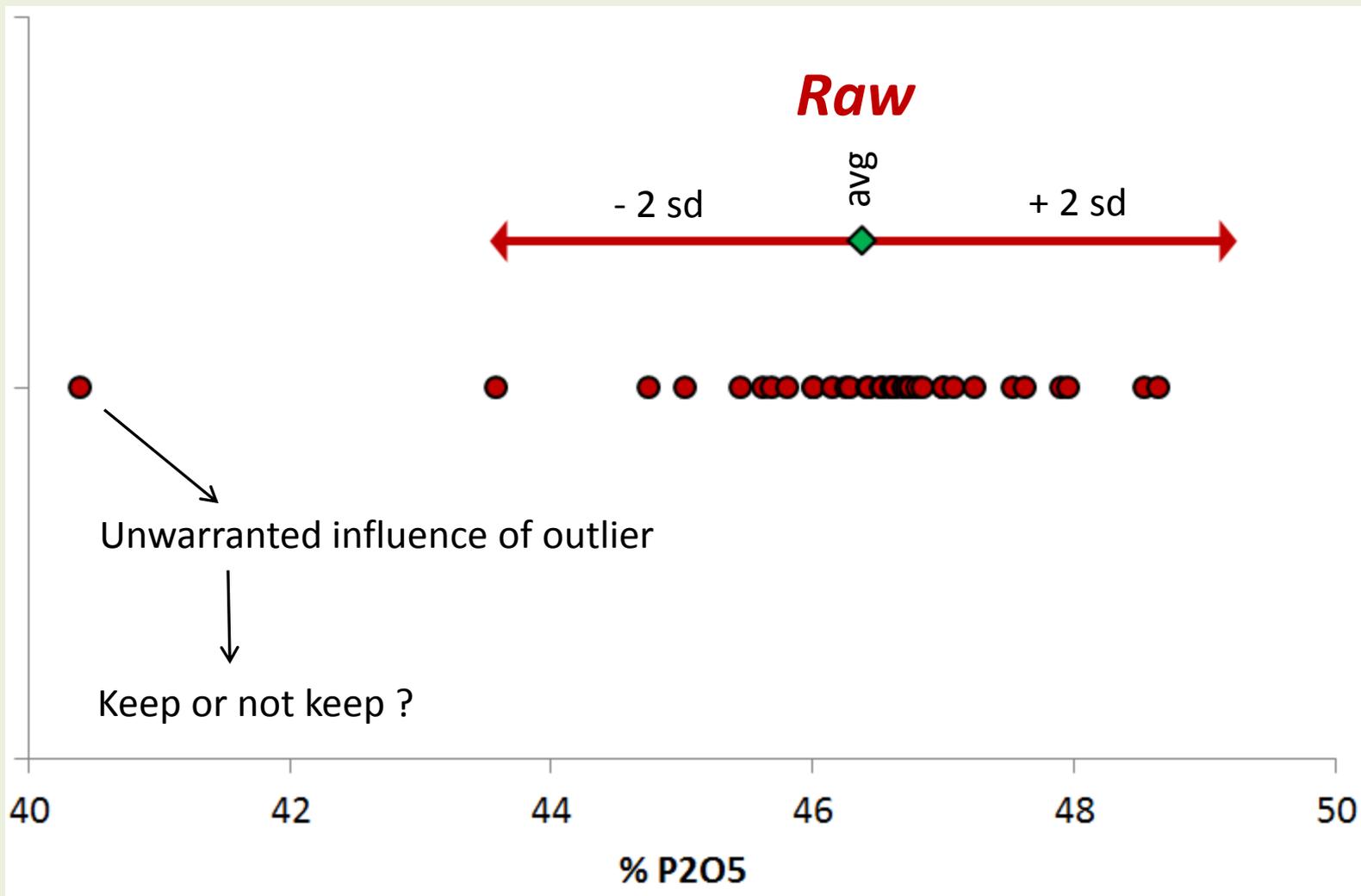


capable of PROVIDING good estimate of population data distribution (μ and σ) with wide a range of data from a SRS

Data for all methods, sample 150111







Not keep : Trimming

Keep : Winsorize

Does the datum belong to the
population distribution
being estimated?

Keep : Winsorize

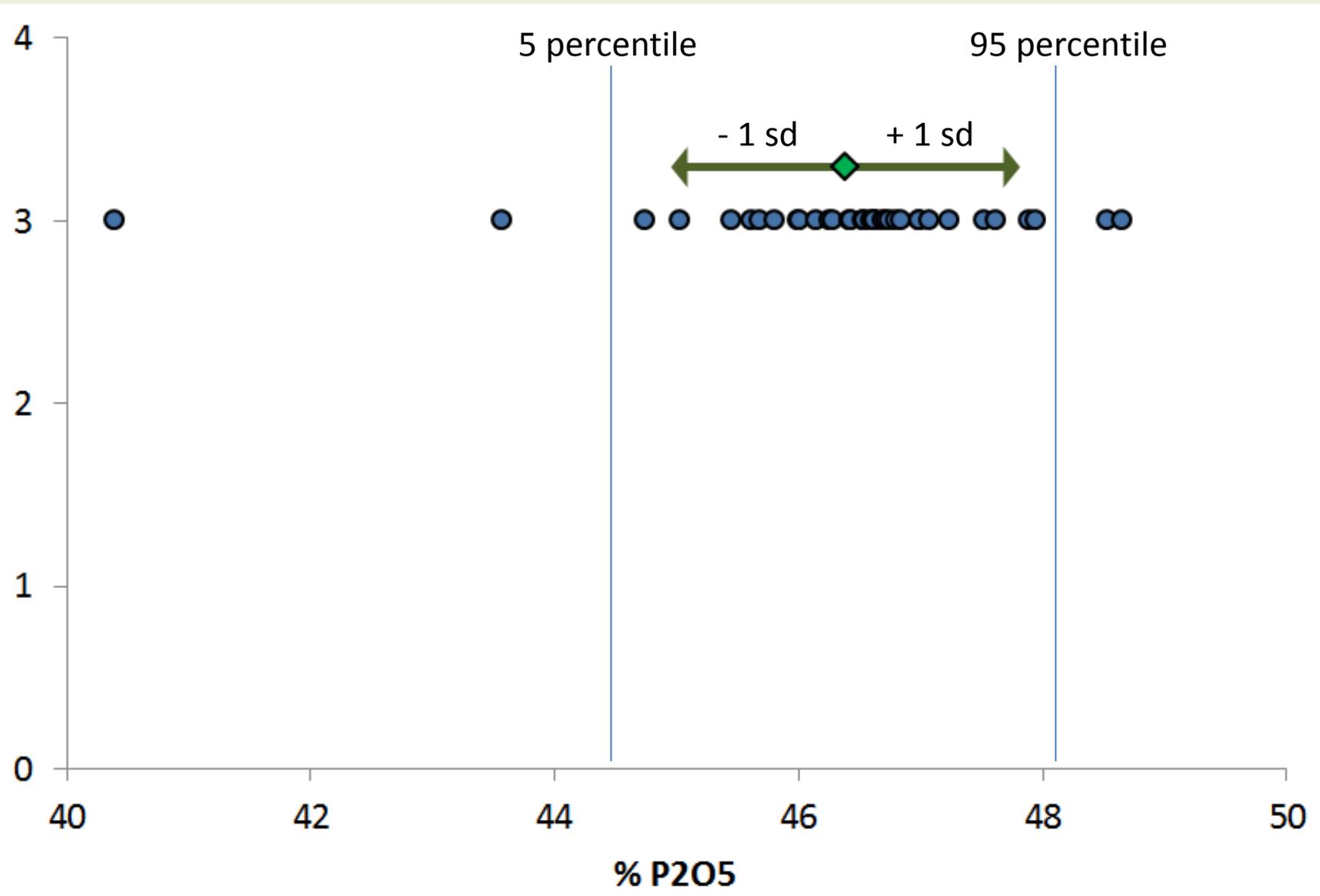
Data points

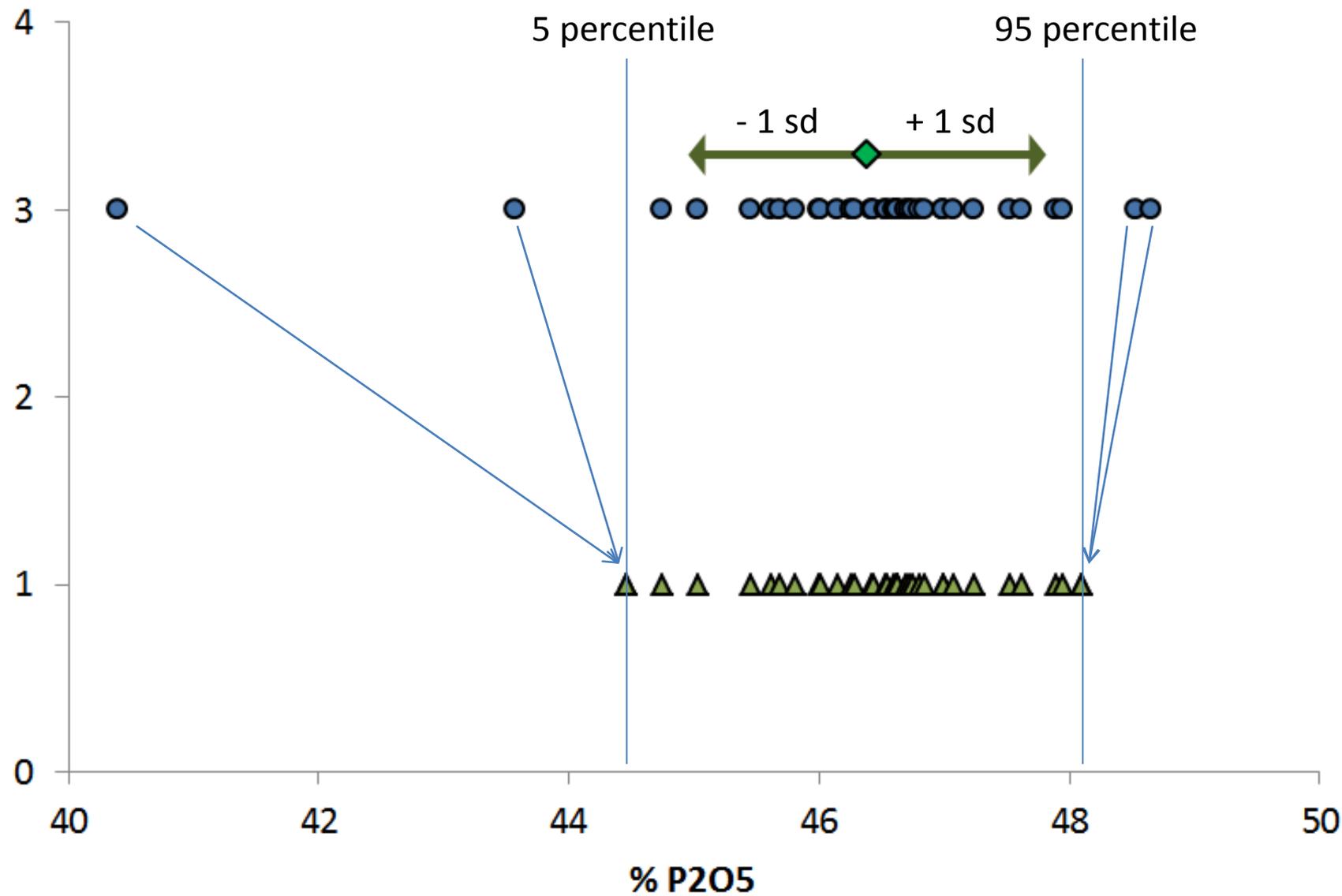
< 5 percentile

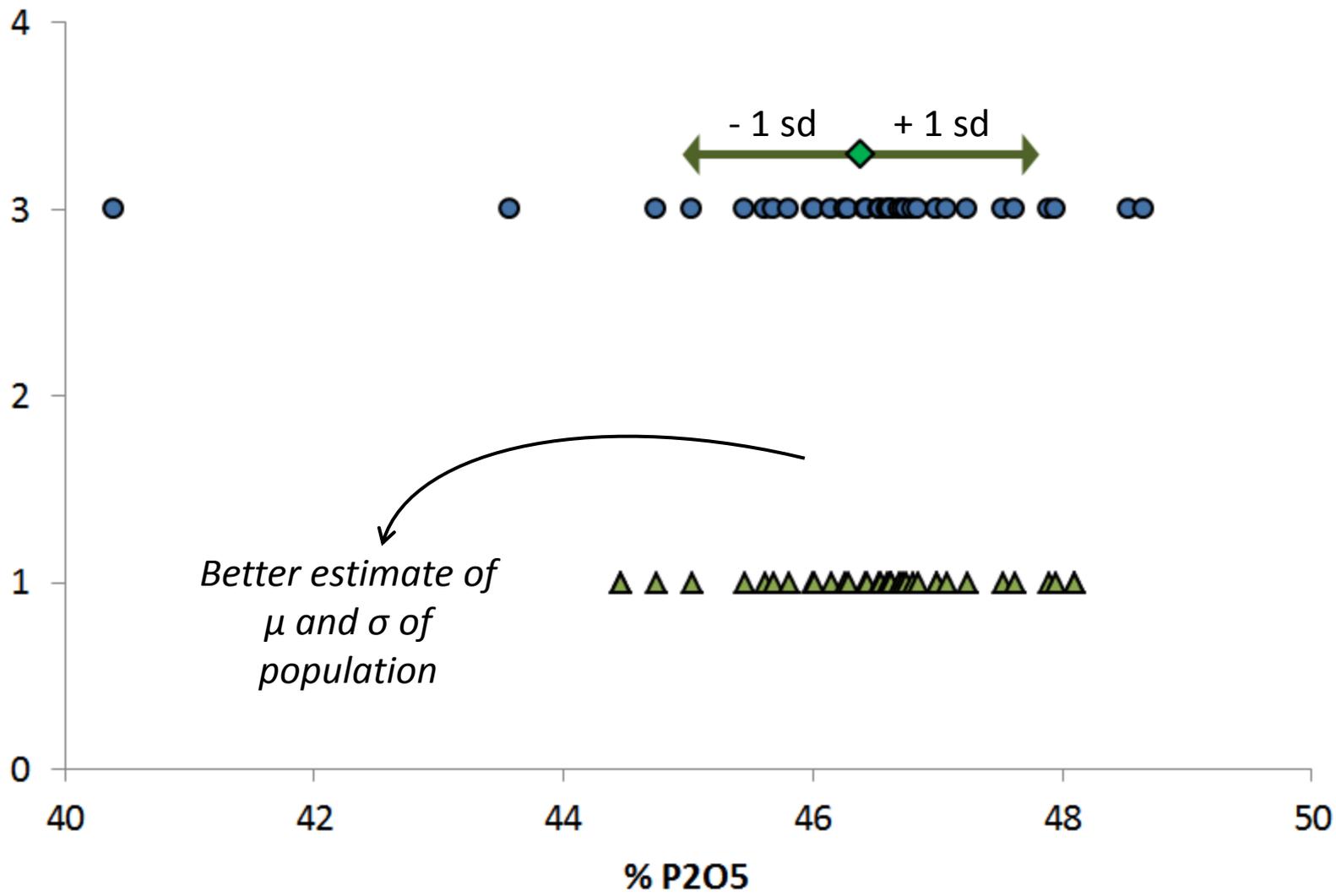
and

> 95 percentile

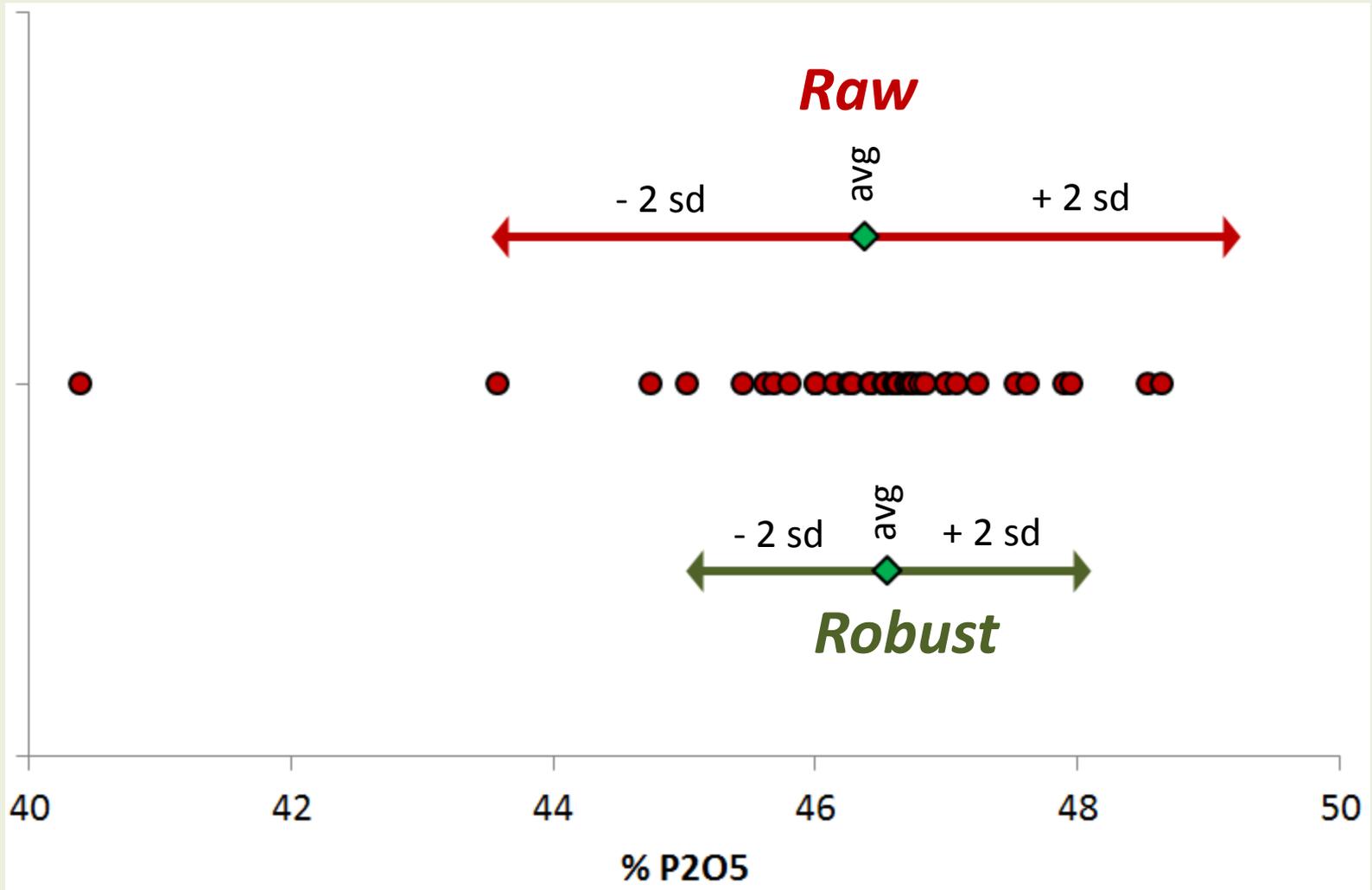
are adjusted.



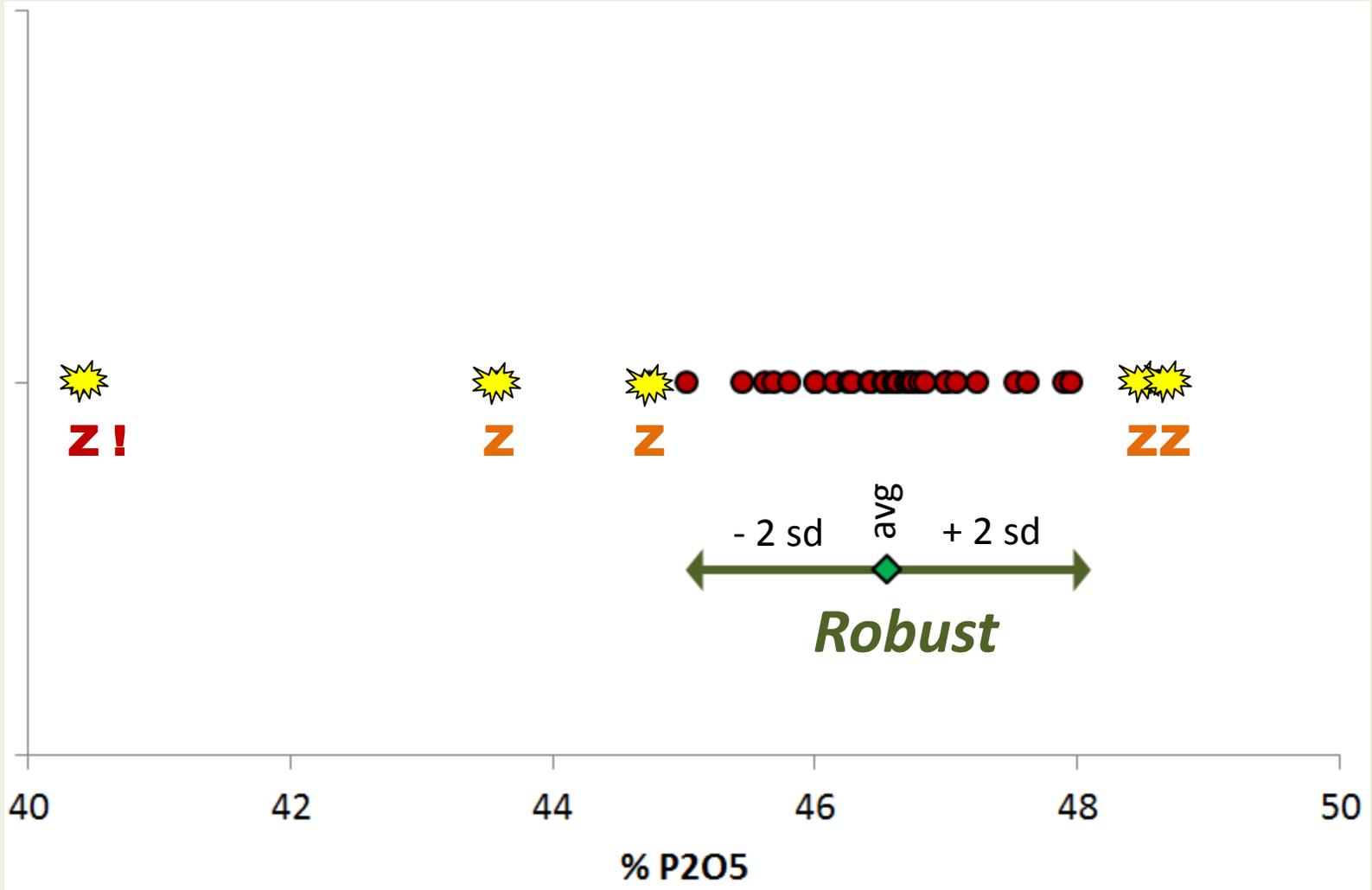




Robust Statistics



Robust Statistics



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STRIVING FOR EXCELLENCE IN ANALYSIS

 **Lab Portal**

Introduction	Method Codes	Data Entry Instructions Training Videos	Statistical Reports Overview Quick Reference Guide Analyte Report Cards	FAQs on DLs	Contacts
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2016 Samples and Reports

JAN 2016 160111 Micros analyte report method report	FEB 2016 160211 24-25-4 analyte report method report	MAR 2016 160311 Biosolids analyte report method report	APR 2016 160411 Liquid ThioS analyte report method report	MAY 2016 160511 Urea analyte report method report	MAY 2016 160512 Micros analyte report method report	JUN 2016 160611 WS 25-5-15 analyte report method report
JUL 2016 160711 12-12-12+micros analyte report method report	AUG 2016 160811 Liquid Organic analyte report method report	SEP 2016 160911 MAP analyte report method report	OCT 2016 161011 MOP analyte report method report	OCT 2016 161012 ZnSO4 analyte report method report	NOV 2016 161111 32-0-10 analyte report method report	DEC 2016 161211 Coated N-P-K analyte report method report



Check Sample Program – Data Reporting

[Samples](#)

[Reports](#)

[User Admin](#)

[Information](#)

[Log Out](#)

User: Frank Sikora Lab #: 9998

2015 Regular Check Sample Program 150311 - 6-9-22

Reports

Analyte All Tests Report
Method All Tests Report
Analyte Statistical Summary
Individual Method Performance Summary

Report Cards

[Method Report Cards](#)

[Analyte Report Cards](#)

Lab Proficiency

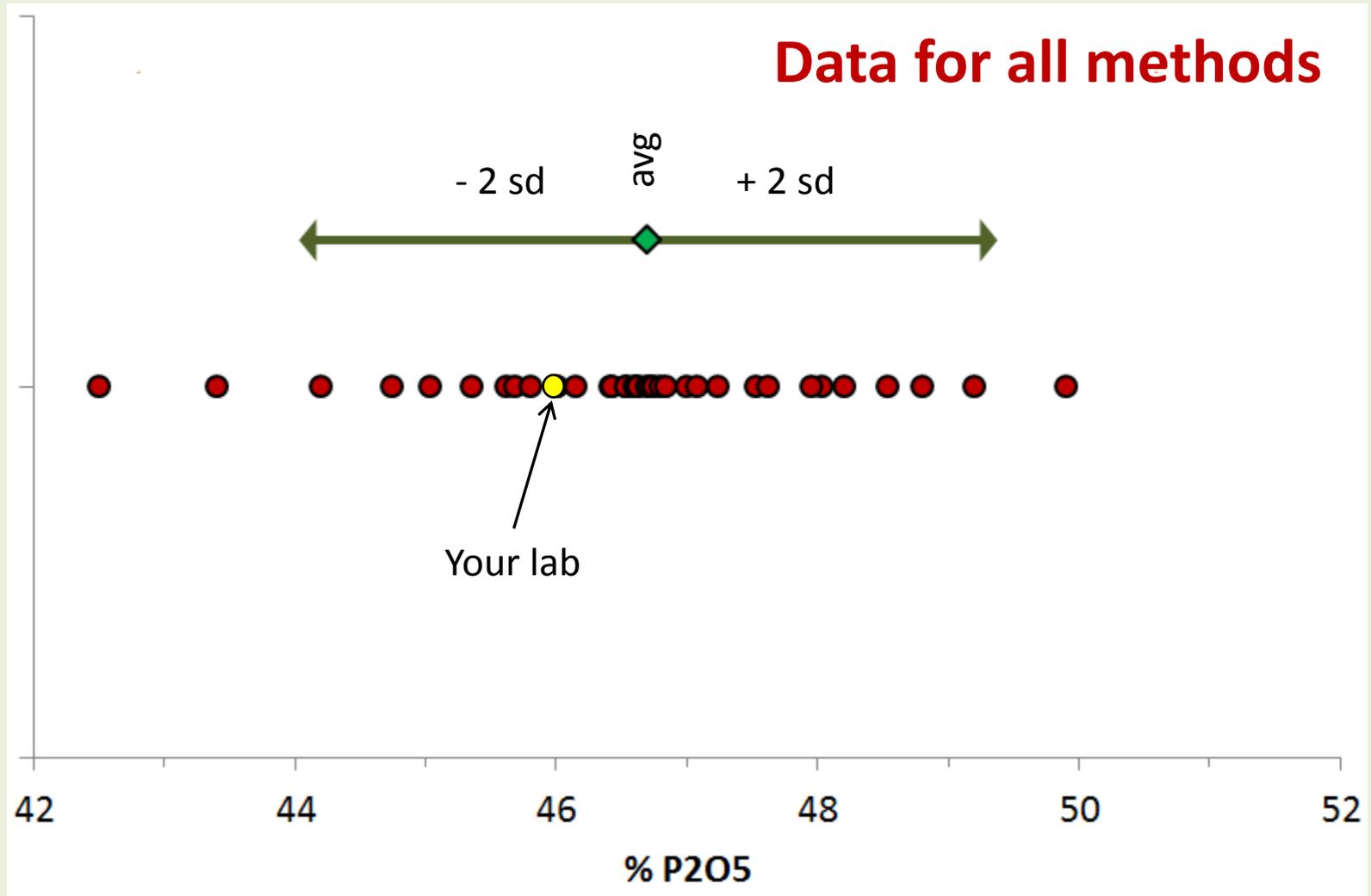
Two yard sticks for measuring

Analyte Proficiency

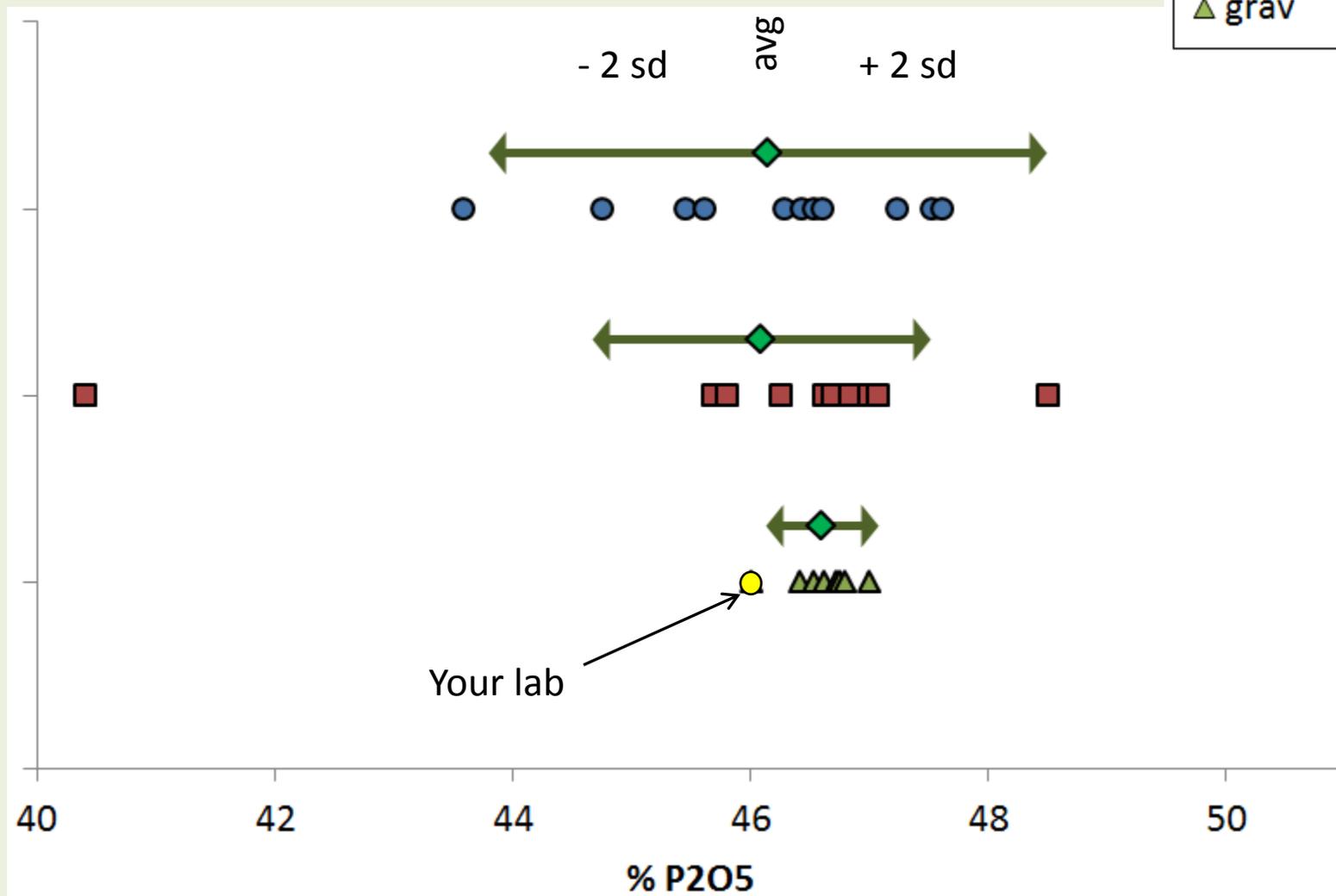
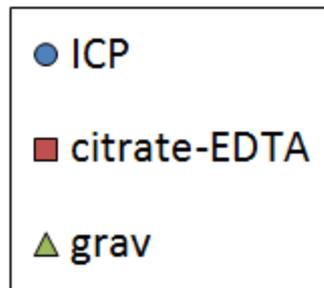
and

Method Proficiency

Analyte Report Cards



Method Report Cards



2015 Regular Check Sample Program

150311 - 6-9-22

Reports

Analyte All Tests Report

Method All Tests Report

Analyte Statistical Summary

Individual Method Performance Summary

Report Cards

Method Report Cards

Analyte Report Cards

2015 Regular Check Sample Program

150311 - 6-9-22

Reports

Analyte All Tests Report
Method All Tests Report
Analyte Statistical Summary
Individual Method Performance Summary

Report Cards

Method Report Cards

Analyte Report Cards

RCS150311AnalyteL0007.pdf	RCS150311AnalyteL0105.pdf	RCS150311AnalyteL0354.pdf	RCS150311AnalyteL0451.pdf
RCS150311AnalyteL0009.pdf	RCS150311AnalyteL0114.pdf	RCS150311AnalyteL0356.pdf	RCS150311AnalyteL0452.pdf
RCS150311AnalyteL0023.pdf	RCS150311AnalyteL0117.pdf	RCS150311AnalyteL0360.pdf	RCS150311AnalyteL0455.pdf
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RCS150311AnalyteL0102.pdf	RCS150311AnalyteL0351.pdf	RCS150311AnalyteL0444.pdf	

Analyte Report Cards

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Sample # 150111: Grade 18-46-0 (DAP)
Analyte Report Card for Lab Code 0325

STRIVING FOR EXCELLENCE IN ANALYSIS

Proficiency Testing For 3 Analytes

Issue Date : 02/28/2015

Analyte Group	Analyte Group (Units)	Lab 0325 Data		Analyte Values				Magruder	Lab 0325	Flag
		Value	range	Rob Mean	Rob SD	R-bar	# Labs	Z Score	Method	
010	Total Nitrogen (18%)	17.60	0.0000	17.74	0.2353	0.0857	66	-0.60	010.60	0
041	Direct Available Phosphorus as P2O5 (46%)	[44.75]	1.500	46.55	0.7703	0.2989	36	-2.34	041.50	0
050	Soluble Potassium as K2O (%)	0.2300	0.2200	0.2191	0.0414	0.0606	14	0.26	050.99	0

Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). Flags indicate data usage: 0 = Used, 1 = rejected for duplicates too far apart, 2 = rejected as extreme outlier and a 4 flag indicates rejected due to 0 value/s submitted. Robust statistics not used if < 6 labs reporting, in this case the Z Scores are included for information only (Grey). Square brackets indicate that [your value] is lower than the Robust Analyte value less the Investigational Allowance. Method or Analyte codes in light green indicate a guaranteed analyte. Individual lab values may be below detection limits but are reported solely for the purpose of this Proficiency Testing program.

Analyte Report Cards

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Sample # 150111: Grade 18-46-0 (DAP)
Analyte Report Card for Lab Code 0325

STRIVING FOR EXCELLENCE IN ANALYSIS

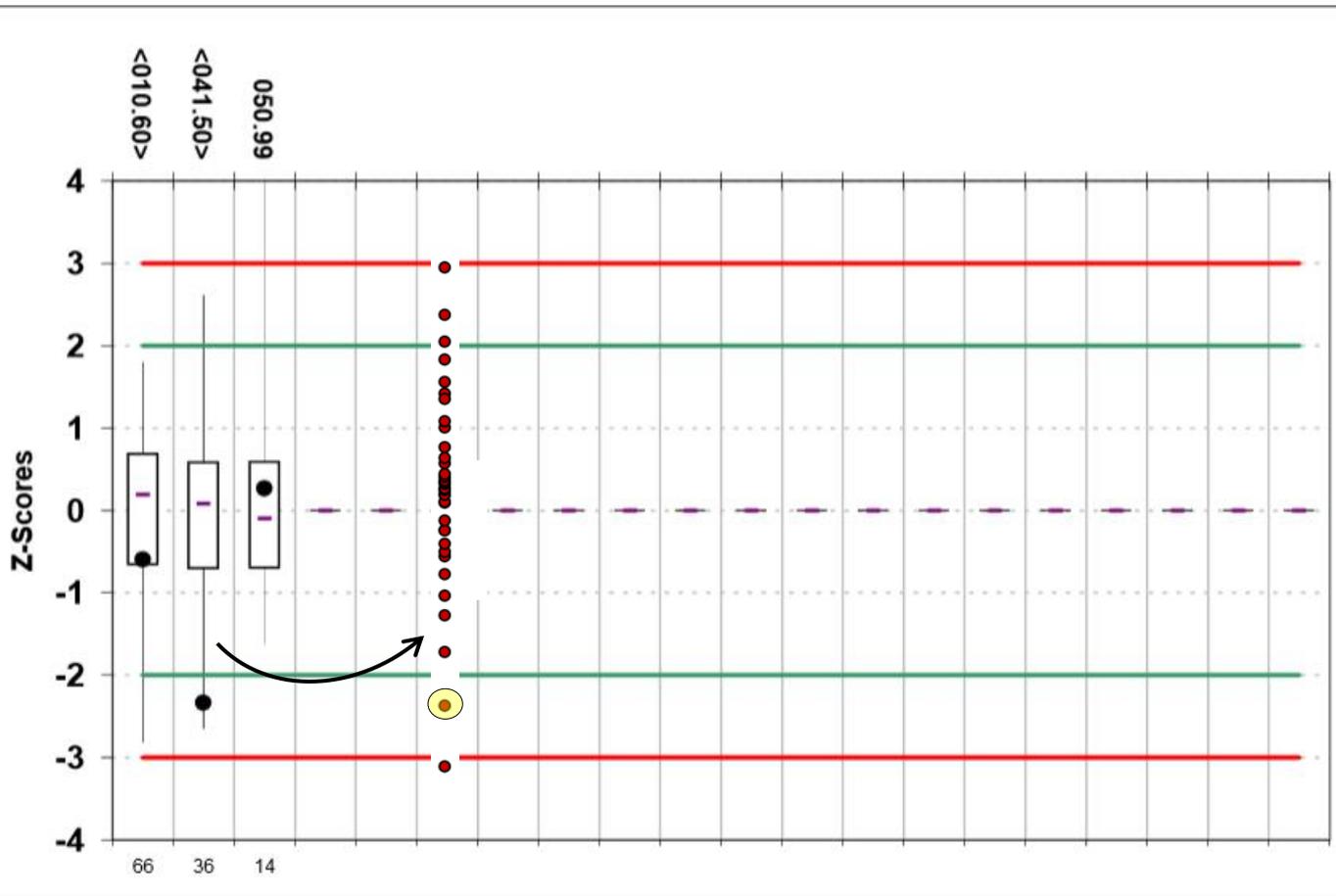
Proficiency Testing For 3 Analytes

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010	Total Nitrogen (18%)	17.60	0.0000	17.74	0.2353	0.0857	66	-0.60	010.60	0
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Z-Score Box and Whisker Plots for Lab # 0325 <guaranteed analyte>



Guaranteed in This Sample			
Analyte	Code	Value*	IA
N	010	17.741	0.696
P2O5	041	46.552	1.008

* Value is the Robust Analyte Value estimated using the primary Analyte Codes for this sample.

Notes: The Methods you used are indicated above and the # Labs involved are below the Box and Whisker. Your Z-Score is indicated by the Dot. If you do not see a Dot your score is off the chart. Dots between the Green lines are acceptable Z-Scores. Dots outside the Red lines are actionable. The Bar, Box and Whisker represent Median, 25% to 75% percentile and 5% to 95% percentile respectively.

Method Report Card

magruder fertilizer
check sample program

Sample # 150811: Grade 25-5-15

Method Report Card for Lab Code 0494

STRIVING FOR EXCELLENCE IN ANALYSIS

Proficiency For 16 Methods

Issue Date : 09/30/2015

Method Code	Analyte Name and Method (Units)	Lab 0494 Data		Method Values				Magruder	Threshold	Flag
		Value	range	Rob Mean	Rob SD	R-bar	# Tests	Z Score	%RSD	
010.60	Total Nitrogen, Combustion (25%)	24.43	0.0100	23.56	1.110	0.2830	51	0.78	2%	0
050.00	Soluble Potassium as K ₂ O, STPB Oxalate (15%)	14.83	0.9200	15.20	0.5261	0.2075	12	-0.70	1%	0
101.33	Acid Soluble Calcium, ICP, test portion 2006.... (%)	0.0177	0.0025			0.0025	1			0
121.33	Acid Soluble Magnesium, ICP, test portion 200... (0.1%)	0.3326	0.0651	0.3638	0.0175	0.0108	6	-1.78	4%	1
148.07	Total Sulfur, ICP, test portion as in 2006.03... (0.13%)	0.3504	0.0599	0.3138	0.0515	0.0322	9	0.71	6%	0
165.30	Acid Soluble Boron , ICP, test portion in 98... (0.025%)	0.0286	0.0001	0.0298	0.0027	0.0018	14	-0.49	2%	0
191.33	Acid Soluble Chromium , ICP, 2006.03 modifie... (ppm)	3.617	0.0101	2.858	1.073	0.4151	2	0.71	13%	0
202.33	Acid Soluble Cobalt , ICP, 2006.03 modified ... (ppm)	16.54	0.8849	14.75	1.571	0.9602	3	1.14	6%	0
221.33	Acid Soluble Copper , ICP, test portion 2006... (0.0125%)	0.0154	0.0000	0.0139	0.0019	0.0003	7	0.79	6%	0
241.33	Acid Soluble Iron , ICP, test portion 2006.03... (0.125%)	0.1265	0.0037	0.1200	0.0220	0.0042	7	0.29	3%	0
251.33	Acid Soluble Lead , ICP, 2006.03 modified w/... (ppm)	2.326	0.0809	2.072	0.3590	1.116	2	0.71	6%	0
261.35	Acid Soluble Manganese , ICP, test portion 2... (0.063%)	0.0669	0.0024	0.0646	0.0024	0.0013	5	0.96	2%	0
289.33	Acid Soluble Molybdenum , ICP, 2006.03 modif... (125ppm)	149.4	10.17	111.4	53.67	20.16	2	0.71	17%	0
291.33	Acid Soluble Nickel , ICP, 2006.03 modified ... (ppm)	22.65	1.462	0.7675	0.4984	1.462	1	43.90	1425%	0
311.33	Sodium, ICP, 2006.03 modified w/9:3 HNO ₃ :HCl ... (%)	0.2306	0.0213	0.2478	0.0244	0.0137	2	-0.71	3%	0
321.33	Acid Soluble Zinc , ICP, test portion 2006.0... (0.063%)	0.0753	0.0015	0.0760	0.0089	0.0030	7	-0.09	0%	0

Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). Flags indicate data usage: 0 = Used, 1 = rejected for duplicates too far apart, 2 = rejected as extreme outlier and a 4 flag indicates rejected due to 0 value/s submitted. Robust statistics not used if < 6 labs used in calculations, in this case the Z Scores are included for information only (Grey). Square brackets indicate that [your value] is lower than the Robust Analyte value less the Investigational Allowance. Method or Analyte codes in light green indicate a guaranteed analyte. Individual lab values may be below detection limits but are reported solely for the purpose of this Proficiency Testing program.

Accuracy vs Precision



Not Accurate; Precise



Accurate; Precise

Accuracy vs Precision



Not Accurate; Not Precise



Accurate; Not Precise

Method Report Card

magruder fertilizer
check sample program

Sample # 150811: Grade 25-5-15

Method Report Card for Lab Code 0494

STRIVING FOR EXCELLENCE IN ANALYSIS

Proficiency For 16 Methods

Issue Date : 09/30/2015

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		Value	range	Rob Mean	Rob SD	R-bar	# Tests	Z Score	%RSD	
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050.00	Soluble Potassium as K ₂ O, STPB Oxalate (15%)	14.83	0.9200	15.20	0.5261	0.2075	12	-0.70	1%	0
101.33	Acid Soluble Calcium, ICP, test portion 2006.... (%)	0.0177	0.0025			0.0025	1			0
121.33	Acid Soluble Magnesium, ICP, test portion 200... (0.1%)	0.3326	0.0651	0.3638	0.0175	0.0108	6	-1.78	4%	1
148.07	Total Sulfur, ICP, test portion as in 2006.03... (0.13%)	0.3504	0.0599	0.3138	0.0515	0.0322	9	0.71	6%	0
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291.33	Acid Soluble Nickel , ICP, 2006.03 modified ... (ppm)	22.65	1.462	0.7675	0.4984	1.462	1	43.90	1425%	0
311.33	Sodium, ICP, 2006.03 modified w/9:3 HNO ₃ :HCl ... (%)	0.2306	0.0213	0.2478	0.0244	0.0137	2	-0.71	3%	0
321.33	Acid Soluble Zinc , ICP, test portion 2006.0... (0.063%)	0.0753	0.0015	0.0760	0.0089	0.0030	7	-0.09	0%	0

Interpreting Z Scores: Red indicates a normally distributed Z value >3 or <-3 (requires action), Orange = Z between 2 and 3 or -2 and -3 (warning) and Green = Z < 2 and >-2 (OK at 95%). Flags indicate data usage: 0 = Used, 1 = rejected for duplicates too far apart, 2 = rejected as extreme outlier and a 4 flag indicates rejected due to 0 value/s submitted. Robust statistics not used if < 6 labs used in calculations, in this case the Z Scores are included for information only (Grey). Square brackets indicate that [your value] is lower than the Robust Analyte value less the Investigational Allowance. Method or Analyte codes in light green indicate a guaranteed analyte. Individual lab values may be below detection limits but are reported solely for the purpose of this Proficiency Testing program.

Method Report Card

magruder fertilizer
check sample program

Sample # 150811: Grade 25-5-15

Method Report Card for Lab Code 0494

STRIVING FOR EXCELLENCE IN ANALYSIS

Proficiency For 16 Methods

Issue Date

Method Code	Analyte Name and Method (Units)	Lab 0494 Data		Method Values				Magruder Z Score
		Value	range	Rob Mean	Rob SD	R-bar	# Tests	
050.00	Soluble Potassium as K ₂ O, STPB Oxalate (15%)	14.83	0.9200	15.20	0.5261	0.2075	12	-0.70

Method Report Card



Sample # 150811: Grade 25-5-15
 Method Report Card for Lab Code 0494

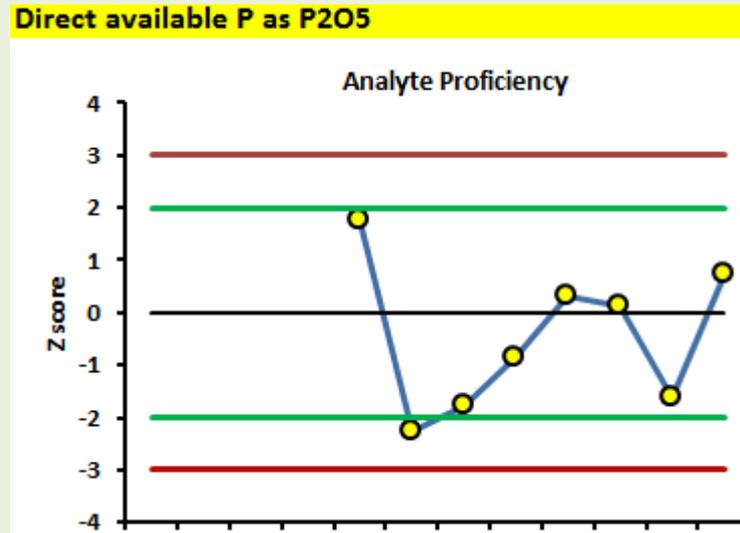
STRIVING FOR EXCELLENCE IN ANALYSIS

Proficiency For 16 Methods

Issue Date : 09/30/2015

Method Code	Analyte Name and Method (Units)	Lab 0494 Data		Method Values				Magruder Z Score	Threshold %RSD	Flag
		Value	range	Rob Mean	Rob SD	R-bar	# Tests			
121.33	Acid Soluble Magnesium, ICP, test portion 200... (0.1%)	0.3326	0.0651	0.3638	0.0175	0.0108	6	-1.78	4%	1

- **Control Charts**



2 excel file versions in beta testing

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D1 fx

1 Enter Data

2

3

4 **Analyte Proficiency**

Sample	Analyte Name	Z Score	Sample Name
151211	Direct available P as P205	0.74	10-10-10
151112	Direct available P as P205	-1.63	MAP
151011	Direct available P as P205	0.13	15-5-10
150912	Direct available P as P205	0.30	8-4-8
150811	Direct available P as P205	-0.86	25-5-15
150711	Direct available P as P205	-1.76	3-8-8
150611	Direct available P as P205	-2.27	MAP plus m
150311	Direct available P as P205	1.75	6-9-22

graphs analyte method Admin

Ready 100%

Rev3_MyControlChart_Phosphorus.xlsm - Microsoft Excel

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1 Enter Data

2

3

4 **Method Proficiency**

Sample	Analyte Name and Method	Z Score	Sample Name
151211	Direct Available P as P205, ICP, citrate-extraction	0.41	10-10-10
151112	Direct Available P as P205, ICP, citrate-extraction	-1.11	MAP
151011	Direct Available P as P205, ICP, citrate-extraction	-0.62	15-5-10
150912	Direct Available P as P205, ICP, citrate-extraction	0.11	8-4-8
150811	Direct Available P as P205, ICP, citrate-extraction	-1.30	25-5-15
150711	Direct Available P as P205, ICP, citrate-extraction	-2.28	3-8-8
150611	Direct Available P as P205, ICP, citrate-extraction	-0.94	MAP plus micros
150311	Direct Available P as P205, ICP, citrate-extraction	0.90	6-9-22

graphs analyte method Admin

Ready 100%

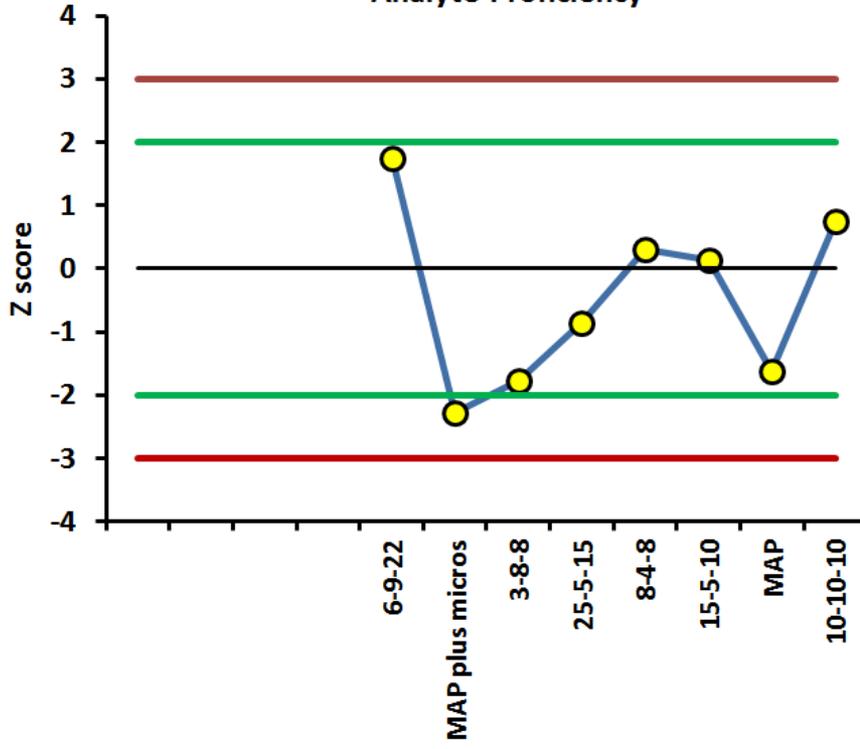
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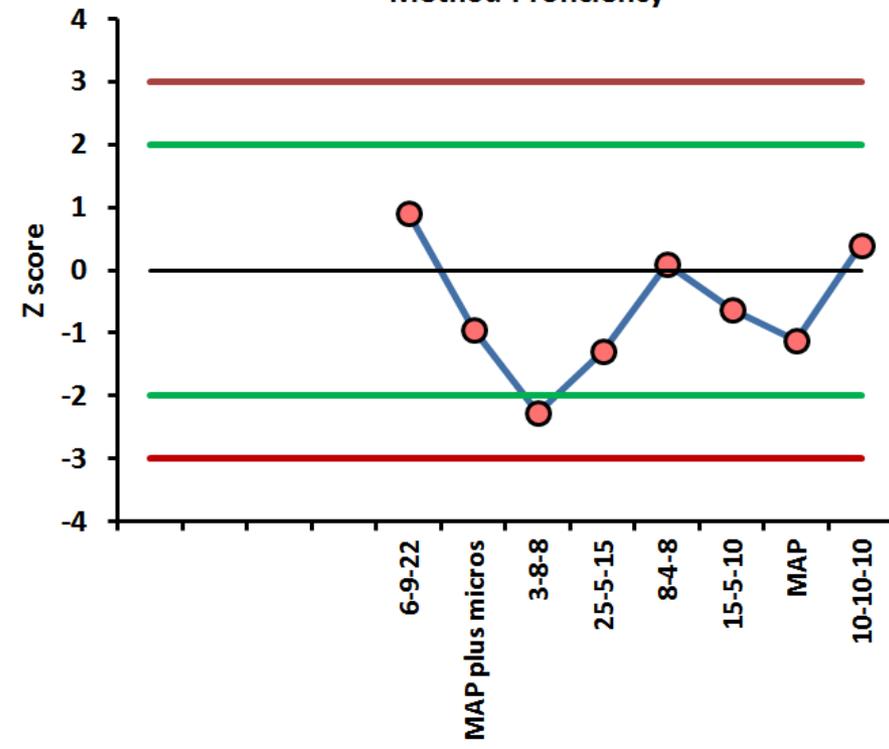
Direct available P as P2O5

Direct Available P as P2O5, ICP, citrate-extraction

Analyte Proficiency



Method Proficiency



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Magruder Check Sample Z Control Charts For Lab 0494

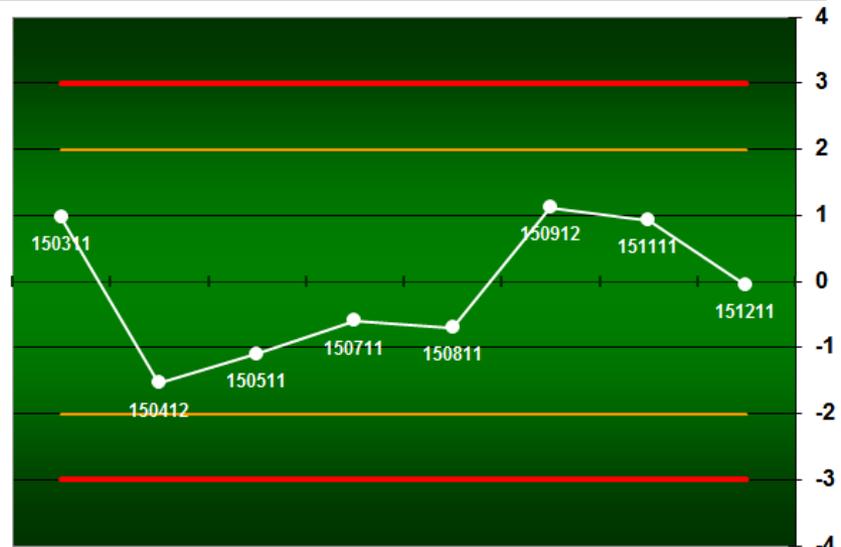
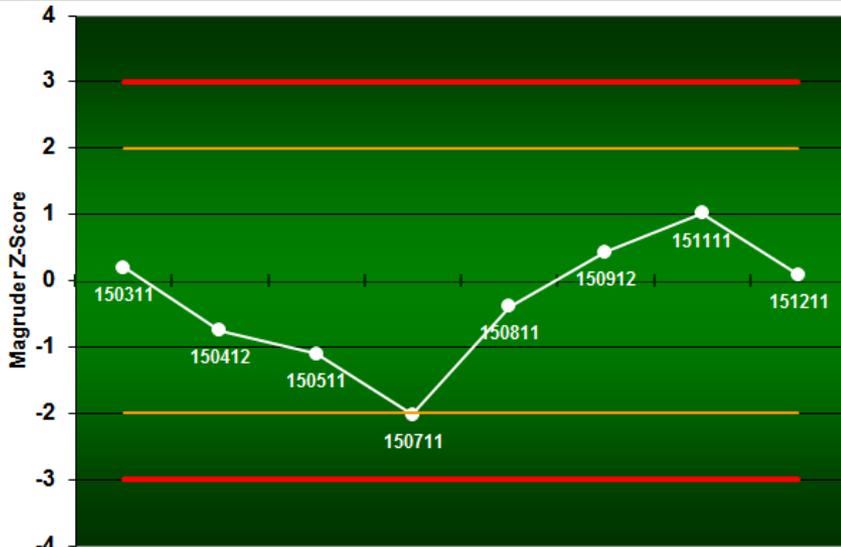
Analyte Code 050

Chart 5 of 41

Method Code 050.00

Soluble Potassium as K2O (%)

Soluble Potassium as K2O, STPB Oxalate (%)



Tap To Scroll Through Charts

- 003.10
- 010.60
- 041.10
- 041.60
- 050.00
- 050.61
- 101.30
- 101.31
- 101.33
- 121.30
- 121.31
- 121.33
- 144.99
- 148.07
- 151.33
- 165.30
- 181.33
- 190.00

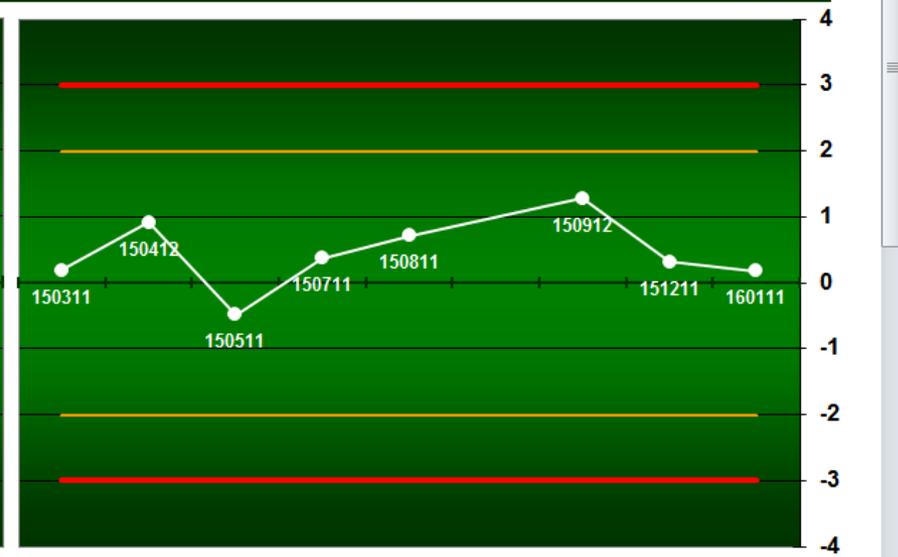
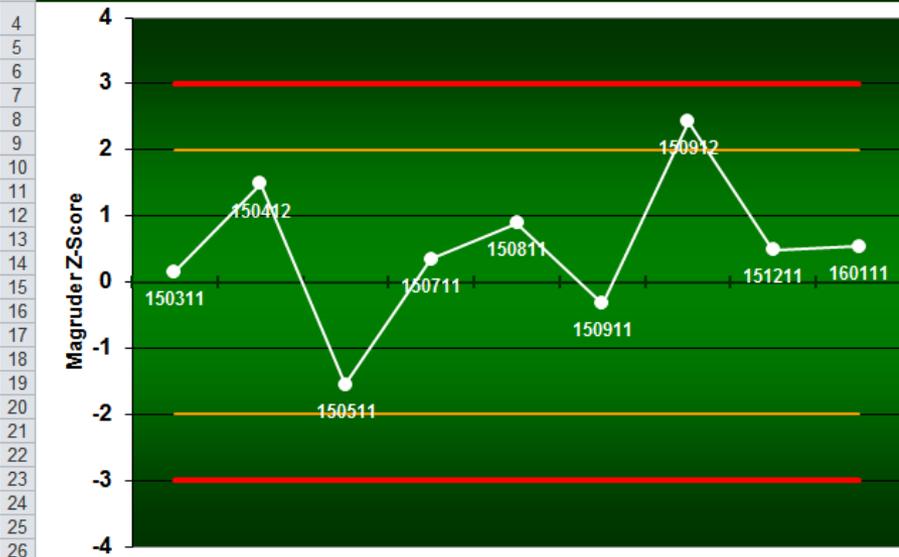
Number of Samples	Analyte Code and Name					Method Code and Name									
	050 Soluble Potassium as K2O (%)					050.00 Soluble Potassium as K2O, STPB Oxalate (%)									
	Sample Name & Code	Z	# Labs	Rob Mean	Rob SD	Method	Code	Z	# Labs	Value	Range	Rob Mean	Rob SD	R-bar	
8	Grade 6-9-22	150311	0.19	81	20.99	0.7683	050.00	150311	0.97	11	21.14	0.4100	20.93	0.2106	0.1118
	SPM	150412	-0.75	78	22.23	0.5984	050.00	150412	-1.54	12	21.78	0.2600	22.13	0.2250	0.1360
	Grade 32-0-4	150511	-1.11	84	3.957	0.1684	050.00	150511	-1.10	14	3.770	0.1200	3.983	0.1938	0.0811
	Grade 3-8-8	150711	-2.02	82	8.324	0.4679	050.00	150711	-0.60	13	7.380*	0.2800	7.819	0.7334	0.1192
	Grade 25-5-15	150811	-0.39	80	15.08	0.6334	050.00	150811	-0.70	12	14.83	0.9200	15.20	0.5261	0.2075
	Grade 8-4-8	150912	0.44	76	8.086	0.2847	050.00	150912	1.12	11	8.210	0.1400	8.099	0.0990	0.0773
	KCl	151111	1.01	76	60.54	0.9397	050.00	151111	0.92	11	61.49	0.3400	60.80	0.7417	0.2291
	Grade 10-10-10	151211	0.09	80	10.27	0.3789	050.00	151211	-0.06	12	10.31	0.1900	10.32	0.1819	0.0800

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B2

magruder fertilizer check sample program
 Magruder Check Sample Z Control Charts For Lab 0494
 Analyte Code 148 Chart 14 of 41 Method Code 148.07



- Tap To Scroll Through Charts
- 003.10
 - 010.60
 - 041.10
 - 041.60
 - 050.61
 - 101.30
 - 101.31
 - 101.33
 - 121.30
 - 121.31
 - 121.33
 - 144.99
 - 148.07**
 - 151.33
 - 165.30
 - 181.33
 - 190.00

Analyte Code and Name							Method Code and Name							
148 Total Sulfur (%)							148.07 Total Sulfur, ICP, test portion as in 2006.03... (%)							
Number of Samples		9		Method Values		Your	Lab Data		Method Values					
Sample Name & Code	Z	# Labs	Rob Mean	Rob SD	Method	Code	Z	# Labs	Value	Range	Rob Mean	Rob SD	R-bar	
Grade 6-9-22	150311	0.15	35	10.23	0.5069	148.07	150311	0.19	8	10.31	1.018	10.23	0.3852	0.3251
SPM	150412	1.48	37	22.59	0.8269	148.07	150412	0.91	10	23.82	1.515	22.72	1.200	0.5122
Grade 32-0-4	150511	-1.55	46	7.625	0.2973	148.07	150511	-0.49	12	7.164	0.1175	7.373	0.4302	0.1753
Grade 3-8-8	150711	0.35	15	7.993	0.6911	148.07	150711	0.37	6	8.233	0.3881	7.983	0.6689	0.2265
Grade 25-5-15	150811	0.89	29	0.2921	0.0654	148.07	150811	0.71	9	0.3504	0.0599	0.3138	0.0515	0.0322
Boron	150911	-0.32	3	0.2005	0.1155	148.07	150911		1	0.1635	0.0011			
Grade 8-4-8	150912	2.43	33	8.768	0.5910	148.07	150912	1.28	9	10.20	0.3555	8.785	1.113	0.3218
Grade 10-10-10	151211	0.48	42	12.00	1.083	148.07	151211	0.32	11	12.52	0.1083	12.23	0.9113	0.1641
Micro Mix	160111	0.53	7	0.2010	0.1211	148.07	160111	0.18	3	0.2702	0.0101	0.2627	0.0415	0.0107



Association of
American Plant
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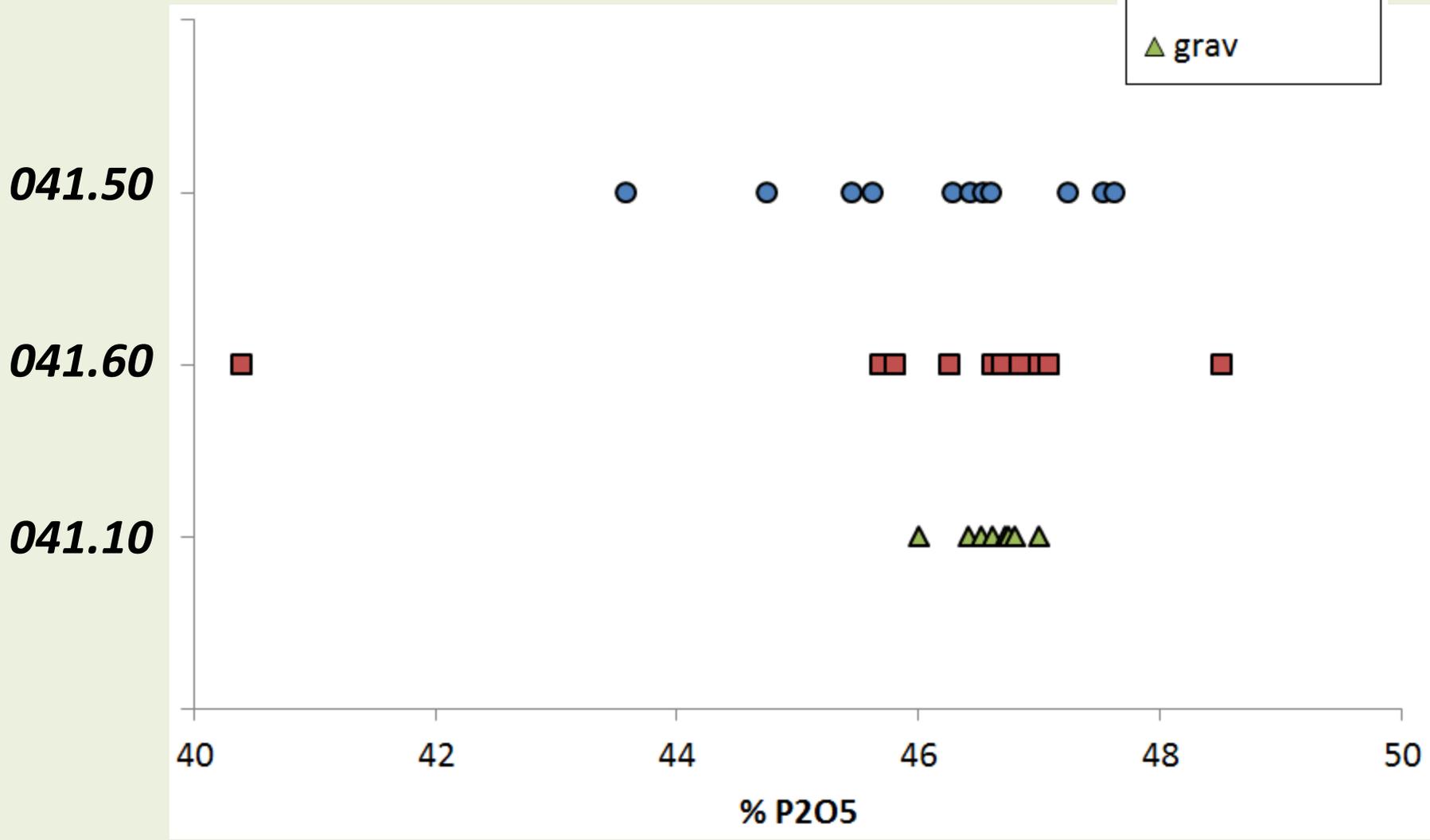
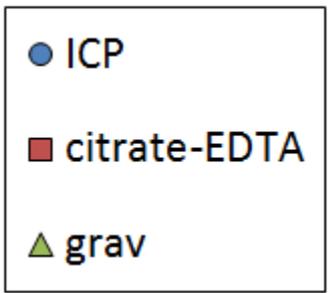
\$300 per year

**1 to 2 samples
per month**

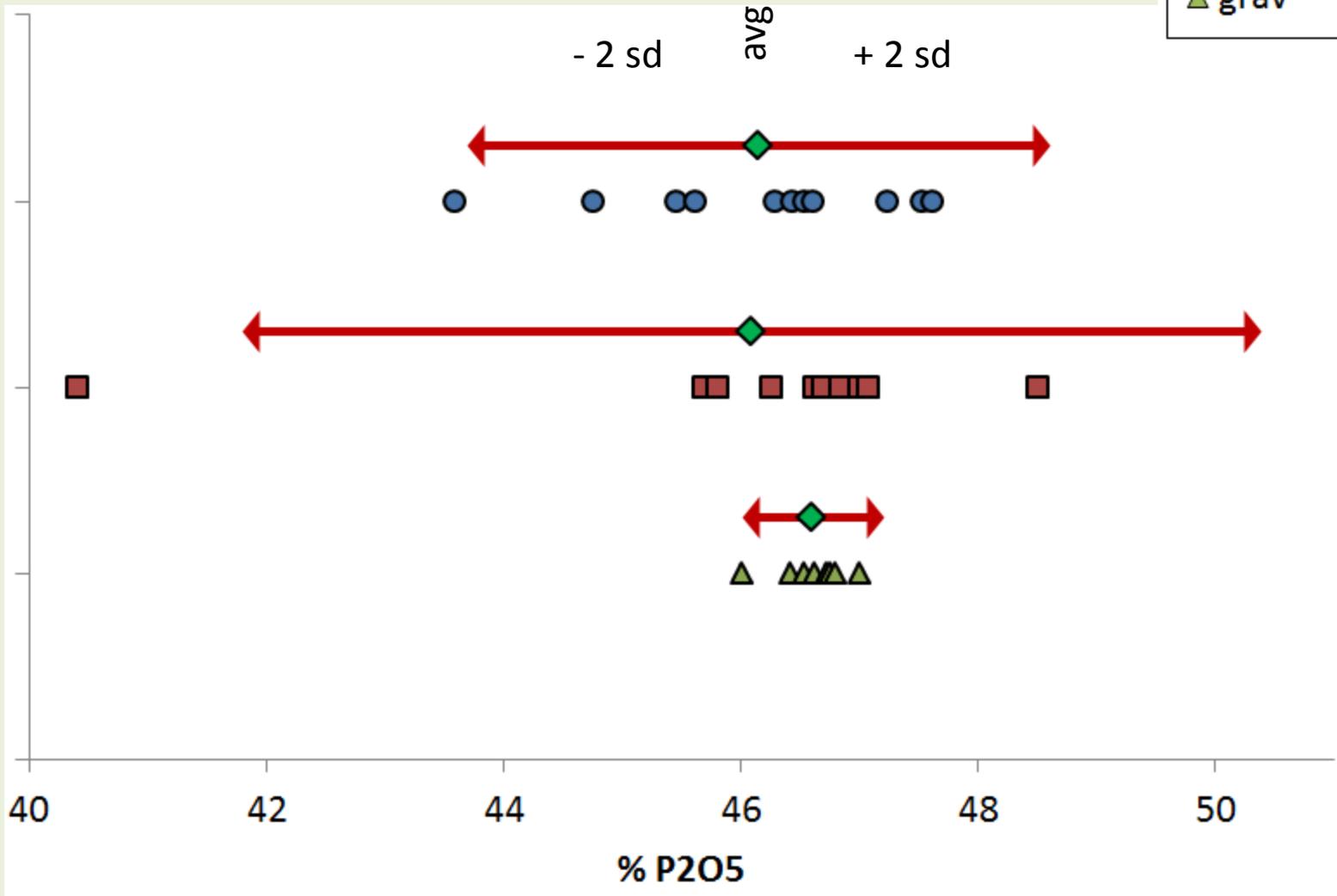
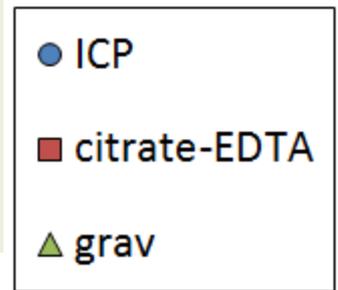
Questions ?



Robust Statistics



Raw statistics



Robust statistics

- ICP
- citrate-EDTA
- ▲ grav

