



Magruder Fertilizer Proficiency Testing

METHOD Summary Statistics

251141 (Phosphate Rock, P Scheme)



Issue Date: 12/31/2025

Code	Analyte / Method (Guarantees in green)	Trueness (Lab Value)						Precision (range)	
		Robust Mean	# Obs	Robust StDev	Robust Uncert.	Robust %RSD	Horwitz %RSD	IA ratio	Robust Mean
020.20	Total P ₂ O ₅ , Spectrophotometric MolybdovanadoP (%)	24.42	4	7.394	4.621	30.3	2.02		0.27
020.50	Total P ₂ O ₅ , ICP (%)	28.24	3	2.532	1.827	8.97	1.88		0.2752
041.11	Direct Available P ₂ O ₅ , Gravimetric Quinolinium, Ci	9.352	3	3.649	2.634	39	2.85		
101.32	Acid Soluble Ca, ICP, test portion 2006.03A-C (%)	33.8	3	7.563	5.458	22.4	1.72		0.14
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.0	0.4605	3	0.1343	0.0969	29.2	4.48		0.0123
121.33	Acid Soluble Mg, ICP, 2017.02 (%)	0.3394	3	0.0036	0.0026	1.05	4.69		0.0195
221.99	Acid Soluble Cu, Other (%)	0.002	3	0.0005	0.0004	23.9	10.11		0.0004
321.99	Acid Soluble Zn, Other (%)	0.0067	3	0.0014	0.001	20.7	8.45		

Statistical parameters of the population: Parameters shown for number of observations (# Obs) > 2. Robust statistics was used if number of observations >=6 for estimate of trueness (blue background) and precision (green background). Classical statistics was used if number of observations = 3, 4, or 5 (no color background)

Horwitz %RSD and IA ratio: These values are benchmarks that can be used to evaluate the variability of a population of data in the round. Horwitz %RSD is a standard benchmark on variability from proficiency testing programs. IA ratio is population variability divided by variability expected from AAPFCO investigational allowance. IA ratios greater than 1 indicate population variability is greater than that expected from the IA.

Appendix

Content Description of Method Summary Statistics Report

Data collected from all the labs provides an estimate of trueness and precision for determination of analyte by specific methods on the Method Summary Statistics report. Determination of summary statistics followed protocols in ISO 13528:2015(E) (Statistical methods for use in proficiency testing by interlaboratory comparison). Robust statistics was used to determine statistical parameters for sets with 6 or more observations. Classical statistics was used for sets with 3, 4, or 5 observations. Robust statistics has an advantage of removing undesired influence of outlying data on the mean and standard deviation without removing data from the statistical analysis.

For trueness, the mean and standard deviation are presented for the number of observations in the population. The uncertainty (Uncert.) is a measure of where the “real” value for the concentration lies around the mean with a 68% certainty. The larger the number of observations, the smaller the uncertainty. The relative standard deviation (%RSD) is a percentage of the standard deviation divided by the mean. The Horwitz %RSD is a standard benchmark on variability developed by Horwitz (https://www.rsc.org/images/horwitz-function-technical-brief-17_tcm18-214859.pdf) that can be used to compare program results with Horwitz expectation. The IA ratio is a measure of how disperse the data is in a population compared to dispersion expected by the AAPFCO investigational allowance (IA). The ratio is the data dispersion in the population divided by IA expected data dispersion. Values greater than 1 indicate data dispersion was greater than IA expected dispersion.

Precision in the data populations is estimated by the range of duplicate results reported. The robust or classical mean is presented along with the number of observations. Any duplicate results that are exactly the same are removed in the determination of the mean to remove undue influence of entries from labs reporting one result twice.



Magruder Fertilizer Proficiency Testing

METHOD All Tests Report

251141 (Phosphate Rock, P Scheme)



Issue Date: 12/31/2025

							Population of Lab Values			
Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Robust Mean	Robust StDev	# Obs	Flag
Ammoniacal N, Other (%)										
001.99	Ammoniacal N, Other (%)	581	0.1	0.1	0.1					
Total P2O5, Spectrophotometric MolybdovanadoP (%)										
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	371	13.2	13.5	13.35	-1.50	24.42	7.394	4	
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	405	27.59	27.62	27.6	0.43	24.42	7.394	4	
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	220	28.02	28.33	28.18	0.51	24.42	7.394	4	
020.20	Total P2O5, Spectrophotometric MolybdovanadoP (%)	581	28.35	28.79	28.57	0.56	24.42	7.394	4	
Total P2O5, Automated (%)										
020.40	Total P2O5, Automated (%)	586	27.75	27.69	27.72					
Total P2O5, ICP (%)										
020.50	Total P2O5, ICP (%)	390	25	25.7	25.35	-1.14	28.24	2.532	3	
020.50	Total P2O5, ICP (%)	368	29.3337	29.2605	29.3	0.42	28.24	2.532	3	
020.50	Total P2O5, ICP (%)	527	30.0438	30.0962	30.07	0.72	28.24	2.532	3	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Total P2O5, Other (%)									
020.99	Total P2O5, Other (%)	513	27.8	27.78	27.79					
020.99	Total P2O5, Other (%)	517	27.8	27.85	27.82					
	Citrate Insoluble P2O5, ICP, test portion 963.03 A-B (%)									
030.50	Citrate Insoluble P2O5, ICP, test portion 963.03 A-B (%)	581	21.76	20.64	21.2					
	Direct Available P2O5, Gravimetric Quinolinium (%)									
041.10	Direct Available P2O5, Gravimetric Quinolinium (%)	494	6.23	6.51	6.37					
	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA Ext. (%)									
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA	185	5.41	5.21	5.31	-1.11	9.352	3.649	3	
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA	220	10.34	10.34	10.34	0.27	9.352	3.649	3	
041.11	Direct Available P2O5, Gravimetric Quinolinium, Citrate-EDTA	405	12.4	12.41	12.4	0.84	9.352	3.649	3	
	Direct Available P2O5, Spectrophotometric, Citrate-EDTA Ext. (%)									
041.21	Direct Available P2O5, Spectrophotometric, Citrate-EDTA Ext.	405	14.8	14.8	14.8					
	Direct Available P2O5, ICP, Citrate-EDTA Ext. (%)									
041.51	Direct Available P2O5, ICP, Citrate-EDTA Ext. (%)	40	14.2	15.3	14.75					
041.51	Direct Available P2O5, ICP, Citrate-EDTA Ext. (%)	494	15.89	16.36	16.12					
	Water Soluble P2O5, Spectrophotometric (%)									
048.20	Water Soluble P2O5, Spectrophotometric (%)	581	0.45	0.61	0.53					

							Population of Lab Values			
Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Robust Mean	Robust StDev	# Obs	Flag
	Soluble K2O, Other (%)									
050.99	Soluble K2O, Other (%)	527	0.1271	0.1305	0.1288					
050.99	Soluble K2O, Other (%)	513	0.16	0.16	0.16					
	Water (Free), Other (%)									
060.99	Water (Free), Other (%)	513	1.27	1.3	1.285					
	Acid Soluble Ca, ICP, test portion inorganic 965.09 (%)									
101.30	Acid Soluble Ca, ICP, test portion inorganic 965.09 (%)	513	29.92	29.7	29.81					
	Acid Soluble Ca, ICP, test portion 2006.03A-C (%)									
101.32	Acid Soluble Ca, ICP, test portion 2006.03A-C (%)	405	28.9	29	28.95	-0.64	33.8	7.563	3	
101.32	Acid Soluble Ca, ICP, test portion 2006.03A-C (%)	220	30.05	29.82	29.94	-0.51	33.8	7.563	3	
101.32	Acid Soluble Ca, ICP, test portion 2006.03A-C (%)	581	42.47	42.56	42.52	1.15	33.8	7.563	3	
	Acid Soluble Ca, ICP, 2017.02 (%)									
101.33	Acid Soluble Ca, ICP, 2017.02 (%)	40	29.77	29.13	29.45					
101.33	Acid Soluble Ca, ICP, 2017.02 (%)	527	30.7611	30.6393	30.7					
	Acid Soluble Ca, Other (%)									
101.99	Acid Soluble Ca, Other (%)	368	25.6322	25.685	25.66					
101.99	Acid Soluble Ca, Other (%)	586	28.6	28.5	28.55					
	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)									
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	390	0.38	0.363	0.3715	-0.66	0.4605	0.1343	3	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	513	0.39	0.4	0.395	-0.49	0.4605	0.1343	3	
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	581	0.62	0.61	0.615	1.15	0.4605	0.1343	3	
Acid Soluble Mg, ICP, test portion 2006.03A-C (%)										
121.32	Acid Soluble Mg, ICP, test portion 2006.03A-C (%)	405	0.347	0.344	0.3455					
121.32	Acid Soluble Mg, ICP, test portion 2006.03A-C (%)	220	0.38	0.37	0.375					
Acid Soluble Mg, ICP, 2017.02 (%)										
121.33	Acid Soluble Mg, ICP, 2017.02 (%)	527	0.3322	0.3388	0.3355	-1.08	0.3394	0.0036	3	
121.33	Acid Soluble Mg, ICP, 2017.02 (%)	40	0.33	0.35	0.34	0.18	0.3394	0.0036	3	
121.33	Acid Soluble Mg, ICP, 2017.02 (%)	494	0.3266	0.3585	0.3426	0.90	0.3394	0.0036	3	
Acid Soluble Mg, Other (%)										
121.99	Acid Soluble Mg, Other (%)	368	0.3454	0.3465	0.346					
121.99	Acid Soluble Mg, Other (%)	586	0.42	0.41	0.415					
Elemental S, Other (%)										
143.99	Elemental S, Other (%)	390	1.05	1.05	1.05					
Total S, ICP, test portion as in 2017.02 (%)										
148.07	Total S, ICP, test portion as in 2017.02 (%)	494	0.884	0.9473	0.9156					
148.07	Total S, ICP, test portion as in 2017.02 (%)	513	1.1	1.1	1.1					
Acid Soluble As, ICP (ppm)										
151.30	Acid Soluble As, ICP (ppm)	513	17.86	19.74	18.8					
151.30	Acid Soluble As, ICP (ppm)	586	25	21	23					

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Acid Soluble As, ICP, 2006.03 (ppm)									
151.32	Acid Soluble As, ICP, 2006.03 (ppm)	220	21.1	21.3	21.2					
151.32	Acid Soluble As, ICP, 2006.03 (ppm)	405	31	32	31.5					
	Acid Soluble As, ICP, 2017.02 (ppm)									
151.33	Acid Soluble As, ICP, 2017.02 (ppm)	494	22.2	20.6	21.4					
151.33	Acid Soluble As, ICP, 2017.02 (ppm)	527	22.8133	23.0822	22.95					
	Acid Soluble As, ICP, EPA 3050B/6010C (ppm)									
151.34	Acid Soluble As, ICP, EPA 3050B/6010C (ppm)	368	27.3	26.3	26.8					
	Acid Soluble As, Other (ppm)									
151.99	Acid Soluble As, Other (ppm)	220	21.5	21.5	21.5					
	Acid Soluble B, Other (%)									
165.99	Acid Soluble B, Other (%)	527	<0.001	<0.001	<0.001				6	
	Acid Soluble Cd, ICP (ppm)									
181.30	Acid Soluble Cd, ICP (ppm)	513	7.54	7.9	7.72					
181.30	Acid Soluble Cd, ICP (ppm)	586	16	23	19.5				1	
	Acid Soluble Cd, ICP, 2006.03 (ppm)									
181.32	Acid Soluble Cd, ICP, 2006.03 (ppm)	220	12.6	12.3	12.45					
181.32	Acid Soluble Cd, ICP, 2006.03 (ppm)	405	14	15	14.5					

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Acid Soluble Cd, ICP, 2017.02 (ppm)									
181.33	Acid Soluble Cd, ICP, 2017.02 (ppm)	494	11.3	11.9	11.6					
181.33	Acid Soluble Cd, ICP, 2017.02 (ppm)	527	14.9967	15.4361	15.22					
	Acid Soluble Cd, ICP, EPA 3050B/6010C (ppm)									
181.34	Acid Soluble Cd, ICP, EPA 3050B/6010C (ppm)	368	12.6	12.5	12.55					
	Acid Soluble Cd, Other (ppm)									
181.99	Acid Soluble Cd, Other (ppm)	220	12.2	12.1	12.15					
	Acid Soluble Cr, ICP (ppm)									
191.30	Acid Soluble Cr, ICP (ppm)	513	43.25	48.18	45.72					
191.30	Acid Soluble Cr, ICP (ppm)	586	67	77	72					
	Acid Soluble Cr, ICP, 2006.03 (ppm)									
191.32	Acid Soluble Cr, ICP, 2006.03 (ppm)	220	64.6	65.1	64.85					
191.32	Acid Soluble Cr, ICP, 2006.03 (ppm)	405	72	72	72					
	Acid Soluble Cr, ICP, 2017.02 (ppm)									
191.33	Acid Soluble Cr, ICP, 2017.02 (ppm)	494	72.9	66.1	69.5					
191.33	Acid Soluble Cr, ICP, 2017.02 (ppm)	527	74.1213	72.9976	73.56					
	Acid Soluble Cr, ICP, EPA 3050B/6010C (ppm)									
191.34	Acid Soluble Cr, ICP, EPA 3050B/6010C (ppm)	368	61.4	60.9	61.15					

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Acid Soluble Cr, Other (ppm)									
191.99	Acid Soluble Cr, Other (ppm)	220	64.7	65.4	65.05					
	Acid Soluble Co, ICP (ppm)									
202.30	Acid Soluble Co, ICP (ppm)	513	0.8	0.79	0.795					
202.30	Acid Soluble Co, ICP (ppm)	586	5	10	7.5				1	
	Acid Soluble Co, ICP, 2006.03 (ppm)									
202.32	Acid Soluble Co, ICP, 2006.03 (ppm)	220	2.95	2.89	2.92					
202.32	Acid Soluble Co, ICP, 2006.03 (ppm)	405	4	4	4					
	Acid Soluble Co, ICP, 2017.02 (ppm)									
202.33	Acid Soluble Co, ICP, 2017.02 (ppm)	527	3.6725	3.6277	3.65					
	Acid Soluble Co, ICP, EPA 3050B/6010C (ppm)									
202.34	Acid Soluble Co, ICP, EPA 3050B/6010C (ppm)	368	3	3.1	3.05					
	Acid Soluble Co, Other (ppm)									
202.99	Acid Soluble Co, Other (ppm)	220	2.99	2.98	2.985					
	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)									
221.30	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)	513	0.0025	0.0026	0.0026					
	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)									
221.32	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)	220	0.0022	0.0022	0.0022					

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
221.32	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)	405	0.0028	0.0029	0.0028					
Acid Soluble Cu, ICP, 2017.02 (%)										
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	527	0.0024	0.0023	0.0024					
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	40	0.0024	0.0023	0.0024					
Acid Soluble Cu, Other (%)										
221.99	Acid Soluble Cu, Other (%)	586	0.002	0.001	0.0015	-1.10	0.002	0.0005	3	1
221.99	Acid Soluble Cu, Other (%)	220	0.0022	0.0021	0.0022	0.24	0.002	0.0005	3	
221.99	Acid Soluble Cu, Other (%)	368	0.0025	0.0024	0.0024	0.86	0.002	0.0005	3	
Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)										
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	390	0.863	0.832	0.8475					
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	513	1.05	1.06	1.055					
Acid Soluble Fe, ICP, test portion 2006.03A-C (%)										
241.32	Acid Soluble Fe, ICP, test portion 2006.03A-C (%)	220	0.97	0.99	0.98					
241.32	Acid Soluble Fe, ICP, test portion 2006.03A-C (%)	581	1.21	1.24	1.225					
Acid Soluble Fe, ICP, 2017.02 (%)										
241.33	Acid Soluble Fe, ICP, 2017.02 (%)	494	0.8929	0.884	0.8884					
241.33	Acid Soluble Fe, ICP, 2017.02 (%)	527	0.9786	1.0074	0.993					
Acid Soluble Pb, ICP (ppm)										
251.30	Acid Soluble Pb, ICP (ppm)	513	6.75	7.11	6.93					
251.30	Acid Soluble Pb, ICP (ppm)	586	13	19	16					1

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Acid Soluble Pb, ICP, 2006.03 (ppm)									
251.32	Acid Soluble Pb, ICP, 2006.03 (ppm)	220	10.5	10.7	10.6					
251.32	Acid Soluble Pb, ICP, 2006.03 (ppm)	405	14	14	14					
	Acid Soluble Pb, ICP, 2017.02 (ppm)									
251.33	Acid Soluble Pb, ICP, 2017.02 (ppm)	494	9.41	10.8	10.1					
251.33	Acid Soluble Pb, ICP, 2017.02 (ppm)	527	11.8309	12.4262	12.13					
	Acid Soluble Pb, ICP, EPA 3050B/6010C (ppm)									
251.34	Acid Soluble Pb, ICP, EPA 3050B/6010C (ppm)	368	19	18.5	18.75					
	Acid Soluble Pb, Other (ppm)									
251.99	Acid Soluble Pb, Other (ppm)	220	10.8	10.8	10.8					
	Acid Soluble Mn, ICP, test portion 972.02a (%)									
261.30	Acid Soluble Mn, ICP, test portion 972.02a (%)	390	0.0076	0.0089	0.0082					
	Acid Soluble Mn, ICP, 2017.02 (%)									
261.35	Acid Soluble Mn, ICP, 2017.02 (%)	527	0.0156	0.0153	0.0154					
	Acid Soluble Hg, ICP (ppm)									
281.30	Acid Soluble Hg, ICP (ppm)	527	<0.001	<0.001	<0.001				6	
281.30	Acid Soluble Hg, ICP (ppm)	405	<2	<2	<2				6	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Acid Soluble Hg, Other (ppm)									
281.99	Acid Soluble Hg, Other (ppm)	220	0.03	0.03	0.03					
	Acid Soluble Mo, ICP (ppm)									
289.30	Acid Soluble Mo, ICP (ppm)	513	9.52	10.27	9.895					
289.30	Acid Soluble Mo, ICP (ppm)	586	21	25	23				1	
	Acid Soluble Mo, ICP, 2006.03 (ppm)									
289.32	Acid Soluble Mo, ICP, 2006.03 (ppm)	220	14.2	14.5	14.35					
289.32	Acid Soluble Mo, ICP, 2006.03 (ppm)	405	16	16	16					
	Acid Soluble Mo, ICP, 2017.02 (ppm)									
289.33	Acid Soluble Mo, ICP, 2017.02 (ppm)	527	14.1286	14.9099	14.52					
289.33	Acid Soluble Mo, ICP, 2017.02 (ppm)	494	14.8	14.3	14.55					
	Acid Soluble Mo, ICP, EPA 3050B/6010C (ppm)									
289.34	Acid Soluble Mo, ICP, EPA 3050B/6010C (ppm)	368	14.2	14.2	14.2					
	Acid Soluble Mo, Other (ppm)									
289.99	Acid Soluble Mo, Other (ppm)	220	14.8	14.4	14.6					
	Acid Soluble Ni, ICP (ppm)									
291.30	Acid Soluble Ni, ICP (ppm)	513	9.52	10.27	9.895					
291.30	Acid Soluble Ni, ICP (ppm)	586	16	20	18				1	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Acid Soluble Ni, ICP, 2006.03 (ppm)									
291.32	Acid Soluble Ni, ICP, 2006.03 (ppm)	220	15.2	15.3	15.25					
291.32	Acid Soluble Ni, ICP, 2006.03 (ppm)	405	22	22	22					
	Acid Soluble Ni, ICP, 2017.02 (ppm)									
291.33	Acid Soluble Ni, ICP, 2017.02 (ppm)	527	15.6928	15.2821	15.49					
	Acid Soluble Ni, ICP, EPA 3050B/6010C (ppm)									
291.34	Acid Soluble Ni, ICP, EPA 3050B/6010C (ppm)	368	15.5	15.6	15.55					
	Acid Soluble Ni, Other (ppm)									
291.99	Acid Soluble Ni, Other (ppm)	220	15.4	15.4	15.4					
	Acid Soluble Se, ICP (ppm)									
301.30	Acid Soluble Se, ICP (ppm)	513	1.6	1.39	1.495					
	Acid Soluble Se, ICP, 2006.03 (ppm)									
301.32	Acid Soluble Se, ICP, 2006.03 (ppm)	220	2	2.1	2.05					
301.32	Acid Soluble Se, ICP, 2006.03 (ppm)	405	11	10	10.5					
	Acid Soluble Se, ICP, 2017.02 (ppm)									
301.33	Acid Soluble Se, ICP, 2017.02 (ppm)	527	<0.001	<0.001	<0.001				6	
	Acid Soluble Se, ICP, EPA 3050B/6010C (ppm)									
301.34	Acid Soluble Se, ICP, EPA 3050B/6010C (ppm)	368	2.1	2.7	2.4					

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Acid Soluble Se, Other (ppm)									
301.99	Acid Soluble Se, Other (ppm)	220	1.96	2.19	2.075					
	Sodium, ICP, test portion as in 2017.02 (%)									
311.33	Sodium, ICP, test portion as in 2017.02 (%)	527	0.6517	0.6584	0.655					
	Sodium, Other (%)									
311.99	Sodium, Other (%)	513	0.28	0.28	0.28					
	Acid Soluble Zn, ICP, test portion inorganic 965.09 (%)									
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (%)	390	0.039	0.0041	0.0216				1	
	Acid Soluble Zn, ICP, test portion 2006.03A-C (%)									
321.32	Acid Soluble Zn, ICP, test portion 2006.03A-C (%)	405	0.0065	0.0064	0.0064					
321.32	Acid Soluble Zn, ICP, test portion 2006.03A-C (%)	220	0.0087	0.0084	0.0086					
	Acid Soluble Zn, ICP, 2017.02 (%)									
321.33	Acid Soluble Zn, ICP, 2017.02 (%)	40	0.004	0.004	0.004					
321.33	Acid Soluble Zn, ICP, 2017.02 (%)	527	0.0072	0.0071	0.0072					
	Acid Soluble Zn, Other (%)									
321.99	Acid Soluble Zn, Other (%)	368	0.0053	0.0056	0.0054	-0.91	0.0067	0.0014	3	
321.99	Acid Soluble Zn, Other (%)	586	0.004	0.009	0.0065	-0.16	0.0067	0.0014	3	
321.99	Acid Soluble Zn, Other (%)	220	0.0082	0.0082	0.0082	1.07	0.0067	0.0014	3	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
	Water Soluble Zn, ICP (%)									
325.30	Water Soluble Zn, ICP (%)	513	0.0053	0.0054	0.0054					

Lab Data: Value is the average of 2 reported lab results. † or ‡ beside Lab Value denotes the value exceeds the investigational allowance (IA) around the analyte mean. † denotes value is less than IA and ‡ denotes value is greater than IA. This is noted for guaranteed analytes with # of observations >= 6. Method code and analyte name are shown in green for guaranteed analytes along with guaranteed concentration.

Statistical parameters of the population: Robust statistics was used to determine mean, %RSD, and range if number of observations >=6 (blue background). Classical statistics was used if number of observations = 3, 4, or 5 (pink background). The number of observations in parantheses is the number of values used in the statistical calculation. Footnote on flags below identifies flag numberd where data was rejected and the reason why.

Z scores: Red = Z value >3 or <-3 (action required), Orange = Z value between 2 and 3 or -2 and -3 (warning), Green = Z value between -2 and 2 (pass). Z values are determined for data populations with number of observation >= 3 for values that are not an analytical limit or 0. Color ratings shown for number of observations >=6.

Flags: Flag number denotes whether or not Lab Value was used in the population to determine statistical parameters. No flag number indicates data was used, 1 = data rejected for dups too far apart, 2 = rejected as extreme outlier, 3 = rejected for both dups too far apart and extreme outlier, 4 = removed after manual inspection, 5 = rejected due to zero(s) submitted, 6 = rejected due to analytical limit submitted (eg "<0.1").

Other Method: Unspecified methods are shown without color ratings on Z-score.

Appendix

Content Description of Method All Tests Report

The All Tests reports have results listed for every lab grouped by Method with data in each group sorted by lab value. The reports are helpful to see where your lab result fell within the whole set of data for the Method by identifying your results by your lab number. Data on the right side of the report shows the mean, standard deviation, and number of observations (obs) used in the analysis of each group. An observation was a lab value for a test which was the average of reported duplicate results. Determination of mean and standard deviation followed protocols in ISO 13528:2015(E) (Statistical methods for use in proficiency testing by interlaboratory comparison) where robust statistics was used to determine the mean and standard deviation for 6 or more observations. Robust statistics has an advantage of removing undesired influence of outlying data on the mean and standard deviation without removing data from the statistical analysis. Robust statistics is only appropriate for use on data sets with 6 or more observations. For data sets with 3, 4, or 5 observations, classical calculation of mean and standard deviation was performed. Z scores for data sets with a small number of observations are given less importance as indicated by no color coding of Z score with less than 6 observations. No Z scores were determined for 1 or 2 observations.

Before determining mean and standard deviation for a set of data, data was removed from statistical analysis for various reasons. Mandel statistical analysis was used to identify and remove extreme outliers and lab values from duplicate results that were too far apart (ISO 5725-2:1994, Accuracy (trueness and precision) of measurement methods and results – Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.). Any individual result report of zero or less than a limit had lab value removed from analysis. The lab values removed from analysis are denoted with numerical flags on the far right-hand side of the report. Z scores are reported for data removed due to extreme outlier or duplicates too far apart even though data was not used in the determination of mean and standard deviation. However, Z scores are not reported for results reported as 0 or less than a limit. Also, any submission of just one lab result is removed for consideration in statistical analysis and presentation on reports.

The American Association of Plant Food Control Officials (AAPFCO) recommends limits around a nutrient guarantee that should initiate an investigation if observed nutrient concentration falls outside of the limits. These limits are referred to as Investigational Allowances (IAs). Lab Values that fall outside of the IA limits around the analyte mean are denoted with † (below limit) or ‡ (above limit). These same symbols are also used to denote Lab Values beyond IA limits on Laboratory Report Cards.