Statistical reports have been updated to a new organizational format. ***Statistical analysis remains the same and there are the same number of reports for each sample in a round.***

This file contains the Method Summary Statistics Report and the Method All Tests Report. Information on the content of the reports are included as appendices to each report.

Magruder Fertilizer Proficiency Testing

METHOD Summary Statistics

250911 (Urea, Regular Scheme)

Issue Date: 10/31/2025

		Trueness (Lab Value)							Precision (range)	
Code	Analyte / Method	Robust Mean	# Obs	Robust StDev	Robust Uncert.	Robust %RSD	Horwitz %RSD	IA ratio	Robust Mean	# Obs
005.99	Urea N, Other (%)	**45.62**	**7**	**1.328**	**0.6276**	**2.91**	**1.48**		**0.1425**	**7**
008.10	Biuret, Spectrophotometric (as Biuret) (%)	0.9896	5	0.1623	0.0907	16.4	4		0.0224	4
008.99	Biuret, Other (%)	0.9484	4	0.1402	0.0876	14.8	4.02		0.0843	4
010.12	**Total N, Salicylic (46%)**	45.98	3	0.1922	0.1387	0.42	1.47	0.51	0.13	3
010.60	**Total N, Combustion (46%)**	**46.41**	**48**	**0.389**	**0.0702**	**0.84**	**1.47**	**1.03**	**0.213**	**43**
010.99	**Total N, Other (46%)**	**46.12**	**13**	**0.1915**	**0.0664**	**0.42**	**1.47**	**0.51**	**0.1472**	**13**

Statistical parameters of the population: 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 Analyte and Method Summary Statistics Report

Data collected from all the labs provides an estimate of trueness and precision for determination of an analyte regardless of method (Analyte Summary Statistics) or for determination of analyte by specific methods (Method Summary Statistics). 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 outlying data can have 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 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 undo influence of entries from labs reporting one result twice.

Magruder Fertilizer Proficiency Testing

METHOD All Tests Report

250911 (Urea, Regular Scheme)

Issue Date: 10/31/2025

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
	Ammoniacal N, Other (%)									
001.99	Ammoniacal N, Other (%)	**524**	0.6073	0.8297	**0.7185**					
	Urea N, Urease (as N) (%)									
005.00	Urea N, Urease (as N) (%)	**389**	44	44.05	**44.02**					
005.00	Urea N, Urease (as N) (%)	**368**	46.237	46.179	**46.21**					
	Urea N, Other (%)									
005.99	Urea N, Other (%)	**524**	39.9809	40.053	**40.02**	-3.81	45.62	1.328	7	
005.99	Urea N, Other (%)	**29**	44.34	44.37	**44.36**	-0.86	45.62	1.328	7	
005.99	Urea N, Other (%)	**476**	45.915	45.8878	**45.9**	0.19	45.62	1.328	7	
005.99	Urea N, Other (%)	**584**	46.24	45.68	**45.96**	0.23	45.62	1.328	7	
005.99	Urea N, Other (%)	**602**	46.16	46.25	**46.2**	0.40	45.62	1.328	7	
005.99	Urea N, Other (%)	**605**	46.61	46.34	**46.48**	0.58	45.62	1.328	7	
005.99	Urea N, Other (%)	**309**	46.72	46.87	**46.8**	0.80	45.62	1.328	7	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
	Biuret N, Other (%)									
006.99	Biuret N, Other (%)	**558**	0.75	0.76	**0.755**					
006.99	Biuret N, Other (%)	**534**	1	1	**1**					
	Urea, HPLC, H2O mobile phase (%)									
007.10	Urea, HPLC, H2O mobile phase (%)	**394**	46.135	46.195	**46.16**					
	Urea, Other (%)									
007.99	Urea, Other (%)	**602**	46.16	46.25	**46.2**					
007.99	Urea, Other (%)	**536**	46.15	46.28	**46.22**					
	Biuret, AA (as Biuret) (%)									
008.00	Biuret, AA (as Biuret) (%)	**498**	0.79	0.79	**0.79**					
	Biuret, Spectrophotometric (as Biuret) (%)									
008.10	Biuret, Spectrophotometric (as Biuret) (%)	**572**	0.86	0.85	**0.855**	-0.83	0.9896	0.1623	5	
008.10	Biuret, Spectrophotometric (as Biuret) (%)	**405**	0.89	0.89	**0.89**	-0.61	0.9896	0.1623	5	
008.10	Biuret, Spectrophotometric (as Biuret) (%)	**510**	0.9357	0.9697	**0.9527**	-0.23	0.9896	0.1623	5	
008.10	Biuret, Spectrophotometric (as Biuret) (%)	**513**	0.98	0.99	**0.985**	-0.03	0.9896	0.1623	5	
008.10	Biuret, Spectrophotometric (as Biuret) (%)	**476**	1.2828	1.2474	**1.265**	1.70	0.9896	0.1623	5	
	Biuret, Other (%)									
008.99	Biuret, Other (%)	**394**	0.8049	0.8422	**0.8236**	-0.89	0.9484	0.1402	4	
008.99	Biuret, Other (%)	**220**	0.81	0.91	**0.86**	-0.63	0.9484	0.1402	4	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
008.99	Biuret, Other (%)	**548**	0.96	0.99	**0.975**	0.19	0.9484	0.1402	4	
008.99	Biuret, Other (%)	**536**	1.05	1.22	**1.135**	1.33	0.9484	0.1402	4	
	Total N, Reduced Iron (46 %)									
010.10	Total N, Reduced Iron (%)	**548**	46.45	46.39	**46.42**					
	Total N, Modified Comprehensive (46 %)									
010.11	Total N, Modified Comprehensive (%)	**510**	46.0611	46.1983	**46.13**					
	Total N, Salicylic (46 %)									
010.12	Total N, Salicylic (%)	**117**	45.9	45.8	**45.85**	-0.70	45.98	0.1922	3	
010.12	Total N, Salicylic (%)	**498**	45.8	46	**45.9**	-0.44	45.98	0.1922	3	
010.12	Total N, Salicylic (%)	**602**	46.16	46.25	**46.2**	1.14	45.98	0.1922	3	
	Total N, Combustion (46 %)									
010.60	Total N, Combustion (%)	**360**	43.35	42.67	43.01 †	**-8.74**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**35**	45.1	45.2	45.15 †	**-3.23**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**292**	45.43	45.45	45.44 †	**-2.49**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**389**	45.93	45.62	**45.78**	**-1.63**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**612**	45.61	46.14	**45.88**	**-1.37**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**234**	45.79	46.06	**45.92**	**-1.24**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**423**	45.99	46.09	**46.04**	**-0.95**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**561**	46.04	46.07	**46.06**	**-0.91**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**307**	46.6	45.69	**46.14**	**-0.68**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**521**	46.171	46.171	**46.17**	**-0.61**	46.41	0.389	48	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values			
							Robust Mean	Robust StDev	# Obs	Flag
010.60	Total N, Combustion (%)	**405**	46.17	46.19	**46.18**	**-0.59**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**291**	46.18	46.19	**46.18**	**-0.57**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**422**	46.14	46.25	**46.2**	**-0.55**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**451**	46.1	46.3	**46.2**	**-0.54**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**368**	46.237	46.179	**46.21**	**-0.51**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**624**	46.196	46.311	**46.25**	**-0.40**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**34**	46.11	46.4	**46.26**	**-0.39**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**86**	46.415	46.13	**46.27**	**-0.35**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**169**	46.26	46.3	**46.28**	**-0.33**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**43**	46.08	46.49	**46.28**	**-0.32**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**231**	46.3	46.3	**46.3**	**-0.28**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**95**	46.27	46.33	**46.3**	**-0.28**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**572**	46.31	46.31	**46.31**	**-0.25**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**220**	46.39	46.29	**46.34**	**-0.18**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**136**	46.65	46.07	**46.36**	**-0.12**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**255**	45.909	46.907	**46.41**	**0.00**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**233**	46.5	46.33	**46.42**	**0.02**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**421**	46.67	46.21	**46.44**	**0.08**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**106**	46.55	46.44	**46.5**	**0.22**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**40**	46.5	46.5	**46.5**	**0.24**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**55**	46.41	46.6	**46.5**	**0.25**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**452**	46.53	46.6	**46.56**	**0.40**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**177**	46.461	46.726	**46.59**	**0.48**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**534**	46.7	46.5	**46.6**	**0.49**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**527**	46.66	46.56	**46.61**	**0.52**	46.41	0.389	48	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
010.60	Total N, Combustion (%)	**377**	46.72	46.57	**46.64**	**0.61**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**543**	46.83	46.5	**46.66**	**0.66**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**29**	46.81	46.59	**46.7**	**0.75**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**131**	46.782	46.724	**46.75**	**0.89**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**49**	47.15	46.39	**46.77**	**0.93**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**494**	46.79	46.77	**46.78**	**0.96**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**324**	46.7	47.1	**46.9**	**1.26**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**354**	46.9	46.9	**46.9**	**1.26**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**27**	46.92	46.98	**46.95**	**1.39**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**260**	47.4	46.9	**47.15**	**1.91**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**23**	47.192	47.267	**47.23**	**2.11**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**25**	46.48	48.63	**47.56 ‡**	**2.95**	46.41	0.389	48	1
010.60	Total N, Combustion (%)	**542**	47.59	47.58	**47.58 ‡**	**3.02**	46.41	0.389	48	
010.60	Total N, Combustion (%)	**472**	49.1	49.3	**49.2 ‡**	**7.18**	46.41	0.389	48	

Total N, Other (46 %)

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
010.99	Total N, Other (%)	**524**	44.5898	44.9674	**44.78 †**	**-7.00**	46.12	0.1915	13	
010.99	Total N, Other (%)	**577**	45.82	45.9	**45.86**	**-1.35**	46.12	0.1915	13	
010.99	Total N, Other (%)	**558**	45.6	46.3	**45.95**	**-0.88**	46.12	0.1915	13	
010.99	Total N, Other (%)	**538**	45.9	46.1	**46**	**-0.62**	46.12	0.1915	13	
010.99	Total N, Other (%)	**553**	45.94	46.16	**46.05**	**-0.36**	46.12	0.1915	13	
010.99	Total N, Other (%)	**600**	46.1	46.2	**46.15**	**0.16**	46.12	0.1915	13	
010.99	Total N, Other (%)	**551**	46.16	46.17	**46.16**	**0.24**	46.12	0.1915	13	
010.99	Total N, Other (%)	**602**	46.16	46.25	**46.2**	**0.45**	46.12	0.1915	13	
010.99	Total N, Other (%)	**371**	46.35	46.1	**46.22**	**0.55**	46.12	0.1915	13	

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
010.99	Total N, Other (%)	**559**	46.23	46.22	**46.22**	0.55	46.12	0.1915	13	
010.99	Total N, Other (%)	**513**	46.28	46.2	**46.24**	0.63	46.12	0.1915	13	
010.99	Total N, Other (%)	**394**	46.184	46.299	**46.24**	0.64	46.12	0.1915	13	
010.99	Total N, Other (%)	**545**	46.99	46.9	**46.94**	4.31	46.12	0.1915	13	
	Total P2O5, ICP (%)									
020.50	Total P2O5, ICP (%)	**422**	0.0007	0	**0.0004**					5
020.50	Total P2O5, ICP (%)	**524**	0.0011	0.005	**0.003**					
020.50	Total P2O5, ICP (%)	**472**	0.06	0.09	**0.075**					
	Direct Available P2O5, Spectrophotometric, Citrate-EDTA Ext. (%)									
041.21	Direct Available P2O5, Spectrophotometric, Citrate-EDTA Ext.	**472**	<0.1	<0.1	**<0.1**					6
041.21	Direct Available P2O5, Spectrophotometric, Citrate-EDTA Ext.	**354**	0.011	0.011	**0.011**					
	Water Soluble P2O5, Spectrophotometric (%)									
048.20	Water Soluble P2O5, Spectrophotometric (%)	**472**	<0.1	<0.1	**<0.1**					6
	Soluble K2O, AA (Citrate-EDTA) (%)									
050.32	Soluble K2O, AA (Citrate-EDTA) (%)	**472**	<0.1	<0.1	**<0.1**					6
	Soluble K2O, ICP (Oxalate) (%)									
050.50	Soluble K2O, ICP (Oxalate) (%)	**422**	0.0858	0.036	**0.0609**					
	Soluble K2O, ICP (Citrate-EDTA) (%)									
050.52	Soluble K2O, ICP (Citrate-EDTA) (%)	**354**	0.015	0.016	**0.0155**					

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
Soluble K2O, Other (%)										
050.99	Soluble K2O, Other (%)	**524**	0.0101	0.0127	**0.0114**					
Water (Free), Vacuum Oven (%)										
060.00	Water (Free), Vacuum Oven (%)	**405**	0.14	0.14	**0.14**	-0.67	0.2633	0.1841	3	
060.00	Water (Free), Vacuum Oven (%)	**220**	0.17	0.18	**0.175**	-0.48	0.2633	0.1841	3	
060.00	Water (Free), Vacuum Oven (%)	**561**	0.49	0.46	**0.475**	1.15	0.2633	0.1841	3	
Water (Free), Karl Fischer (%)										
060.20	Water (Free), Karl Fischer (%)	**498**	0.135	0.129	**0.132**	-1.06	0.2758	0.1351	3	
060.20	Water (Free), Karl Fischer (%)	**513**	0.294	0.297	**0.2955**	0.15	0.2758	0.1351	3	
060.20	Water (Free), Karl Fischer (%)	**234**	0.4	0.4	**0.4**	0.92	0.2758	0.1351	3	
Water (Free), AFPC No. 2B (105°C oven for 2 hours, 5g sample) (%)										
060.30	Water (Free), AFPC No. 2B (105°C oven for 2 hours, 5g sampl	**394**	0.132	0.131	**0.1315**					
Water (Free), Other (%)										
060.99	Water (Free), Other (%)	**136**	0.2	0.2	**0.2**	-0.66	1.915	2.594	3	
060.99	Water (Free), Other (%)	**510**	0.5984	0.6936	**0.646**	-0.49	1.915	2.594	3	
060.99	Water (Free), Other (%)	**572**	5	4.8	**4.9**	1.15	1.915	2.594	3	1
Acid Soluble Ca, ICP, test portion inorganic 965.09 (%)										
101.30	Acid Soluble Ca, ICP, test portion inorganic 965.09 (%)	**354**	0.08	0.1	**0.09**					

Code	Analyte and Method	Lab Num	Result1	Result2	Lab Value	Z score	Population of Lab Values: Robust Mean	Robust StDev	# Obs	Flag
Acid Soluble Ca, ICP, 2017.02 (%)										
101.33	Acid Soluble Ca, ICP, 2017.02 (%)	**472**	0.01	0.01	**0.01**					
Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)										
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	**354**	<0.01	0.02	**<0.01**					6
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	**371**	0.12	0.1	**0.11**					
Acid Soluble Mg, ICP, 2017.02 (%)										
121.33	Acid Soluble Mg, ICP, 2017.02 (%)	**472**	0.06	0.08	**0.07**					
Acid Soluble Mg, Other (%)										
121.99	Acid Soluble Mg, Other (%)	**524**	0.0002	0.0005	**0.0004**					
Total S, ICP, test portion as in 2017.02 (%)										
148.07	Total S, ICP, test portion as in 2017.02 (%)	**472**	0.03	0.03	**0.03**					
Total S, Other (%)										
148.99	Total S, Other (%)	**422**	0	0.0157	**0.0078**					5
148.99	Total S, Other (%)	**354**	0.09	0.05	**0.07**					
S - HNO3 soluble, ICP (%)										
149.04	S - HNO3 soluble, ICP (%)	**524**	0.0004	0.0008	**0.0006**					

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 (ppm)										
151.30	Acid Soluble As, ICP (ppm)	**524**	0.0008	0.0017	**0.0012**					
Acid Soluble B, ICP, test portion in 982.01 (%)										
165.30	Acid Soluble B, ICP, test portion in 982.01 (%)	**354**	<0.01	<0.01	**<0.01**					6
165.30	Acid Soluble B, ICP, test portion in 982.01 (%)	**371**	0	0	**0**					5
Acid Soluble B, Other (%)										
165.99	Acid Soluble B, Other (%)	**472**	<0.01	<0.01	**<0.01**					6
Acid Soluble Cd, ICP (ppm)										
181.30	Acid Soluble Cd, ICP (ppm)	**524**	0.0152	0.0399	**0.0276**					
Acid Soluble Cr, ICP (ppm)										
191.30	Acid Soluble Cr, ICP (ppm)	**524**	0.3236	0.3536	**0.3386**					
Acid Soluble Co, ICP (ppm)										
202.30	Acid Soluble Co, ICP (ppm)	**524**	0.0373	0.1455	**0.0914**					
Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)										
221.30	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)	**354**	<0.01	<0.01	**<0.01**					6
221.30	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)	**371**	0	0	**0**					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 Cu, ICP, 2017.02 (%)									
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	**472**	<0.01	<0.01	**<0.01**					6
	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)									
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	**354**	<0.01	<0.01	**<0.01**					6
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	**371**	0.01	0.01	**0.01**					
	Acid Soluble Fe, ICP, 2017.02 (%)									
241.33	Acid Soluble Fe, ICP, 2017.02 (%)	**472**	<0.01	<0.01	**<0.01**					6
	Acid Soluble Fe, Other (%)									
241.99	Acid Soluble Fe, Other (%)	**524**	0.0003	0.0007	**0.0005**					
	Acid Soluble Pb, ICP (ppm)									
251.30	Acid Soluble Pb, ICP (ppm)	**524**	0.2392	0.3058	**0.2725**					
	Acid Soluble Mn, ICP, test portion 972.02a (%)									
261.30	Acid Soluble Mn, ICP, test portion 972.02a (%)	**354**	<0.01	<0.01	**<0.01**					6
	Acid Soluble Mn, ICP, test portion inorganic 965.09 (%)									
261.32	Acid Soluble Mn, ICP, test portion inorganic 965.09 (%)	**371**	0	0	**0**					5
	Acid Soluble Mn, ICP, 2017.02 (%)									
261.35	Acid Soluble Mn, ICP, 2017.02 (%)	**472**	<0.01	<0.01	**<0.01**					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 Mo, ICP (ppm)									
289.30	Acid Soluble Mo, ICP (ppm)	**524**	0.2095	0.3284	**0.269**					
	Acid Soluble Ni, ICP (ppm)									
291.30	Acid Soluble Ni, ICP (ppm)	**524**	0.2971	0.3813	**0.3392**					
	Acid Soluble Se, ICP (ppm)									
301.30	Acid Soluble Se, ICP (ppm)	**524**	0.0089	0.0043	**0.0066**					
	Sodium, Other (%)									
311.99	Sodium, Other (%)	**354**	0.03	0.04	**0.035**					
	Acid Soluble Zn, ICP, test portion inorganic 965.09 (%)									
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (%)	**354**	<0.01	<0.01	**<0.01**					6
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (%)	**371**	0.01	0.01	**0.01**					
	Acid Soluble Zn, ICP, 2017.02 (%)									
321.33	Acid Soluble Zn, ICP, 2017.02 (%)	**472**	<0.01	<0.01	**<0.01**					6

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 outier, 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 Analyte and Method All Tests Report

The All Tests reports have results listed for every lab grouped by Analyte or 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 Analyte or 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 outlying data can have 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.