

Method PT For All Labs

Magruder Fertilizer Proficiency Testing Program

# Methods: 49

Sample # 221031

Nitrogen Select PT Scheme

# Labs Reporting: 19

(NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>

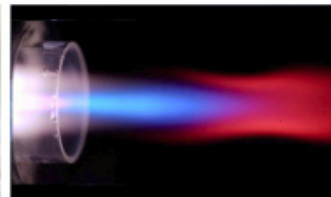
Statistical Summary

Issue Date : 11/30/2022

Method Code	Analyte & Method Sample # 221031	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Method Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Method IA Ratio	Average Range (R-bar)	Horwitz %RSD
001.10	Ammoniacal N, Magnesium Oxide Method (%)	1		21.03									
001.99	Ammoniacal N, Other (%)	6	6	21.04	0.1730	21.07		0.1125	0.0574	0.53%		0.0567	2.18%
010.17	Total N, Comprehensive (21%)	1		21.03									
010.60	Total N, Combustion (21%)	13	13	21.15	0.3716	21.18	0.7418	0.2830	0.0981	1.34%	0.89	0.1585	2.17%
010.99	Total N, Other (21%)	3	3	21.36	0.5532	21.36	0.7436	0.5532	0.3992	2.59%	1.73	0.0733	2.16%
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	1		0.0005									
143.00	Elemental S, Gravimetric Sulfur - carbon disulfide soluble sulfu	1		0.0300									
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	4	4	23.52	1.556	23.52		1.556	0.9724	6.61%		0.1550	2.06%
145.99	Sulfate S, HCl soluble, Other (%)	2	2	23.55	0.0707								
148.00	Total S, Combustion (24%)	3	3	23.73	0.9485	23.73	1.0000	0.9485	0.6845	4.00%	2.21	0.3333	2.05%
148.01	Total S, Gravimetric - sulfate and elemental (24%)	5	5	23.97	1.535	23.97	1.0000	1.535	0.8582	6.41%	3.58	0.0479	2.04%
148.07	Total S, ICP, test portion as in 2017.02 (24%)	4	4	25.09	1.335	25.09	1.0000	1.335	0.8344	5.32%	3.11	0.3017	2.00%
148.99	Total S, Other (24%)	5	5	24.12	0.7493	24.12	1.0000	0.7493	0.4189	3.11%	1.75	0.0340	2.04%
151.30	Acid Soluble As, ICP (ppm)	4	2	0.4263	0.6627	0.1475		0.2015	0.1781	136.63%		0.0400	21.34%
151.32	Acid Soluble As, ICP, 2006.03 (ppm)	1		3.000									
151.99	Acid Soluble As, Other (ppm)	1		0.6000									
181.30	Acid Soluble Cd, ICP (ppm)	4	2	1.379	2.748	2.752		3.886	3.435	141.19%		1.501	13.74%
181.32	Acid Soluble Cd, ICP, 2006.03 (ppm)	1		1.000									
181.99	Acid Soluble Cd, Other (ppm)	1		0.1000									
191.30	Acid Soluble Cr, ICP (ppm)	4	4	1.662	2.565	1.662		2.565	1.603	154.31%		0.7528	14.82%
191.32	Acid Soluble Cr, ICP, 2006.03 (ppm)	1		1.000									
191.99	Acid Soluble Cr, Other (ppm)	1		2.000									
202.30	Acid Soluble Co, ICP (ppm)	4	2	0.7534	1.498	1.502	1.4505	2.119	1.873	141.09%	3.40	1.002	15.05%
202.32	Acid Soluble Co, ICP, 2006.03 (ppm)	1		1.000									
202.99	Acid Soluble Co, Other (ppm)	1		0.1000									
221.30	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)	1		0.0000									
221.32	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)	1		0.0006									
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	1		0.0000									
221.99	Acid Soluble Cu, Other (%)	2	0	0.0006	0.0006								

Method Code	Analyte & Method Sample # 221031	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Method Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Method IA Ratio	Average Range (R-bar)	Horwitz %RSD
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	1		0.0009									
251.30	Acid Soluble Pb, ICP (ppm)	4	2	1.128	2.248	2.251		3.181	2.812	141.33%		1.501	14.16%
251.32	Acid Soluble Pb, ICP, 2006.03 (ppm)	1		4.000									
261.32	Acid Soluble Mn, ICP, test portion inorganic 965.09 (%)	1		0.0000									
281.30	Acid Soluble Hg, ICP (ppm)	3	1	0.6710	1.151	2.251		3.181	3.976	141.33%		0.0040	14.16%
281.99	Acid Soluble Hg, Other (ppm)	1		0.0100									
289.30	Acid Soluble Mo, ICP (ppm)	3	3	2.640	4.426	2.640	1.7920	4.426	3.194	167.64%	5.75	1.180	13.82%
289.32	Acid Soluble Mo, ICP, 2006.03 (ppm)	1		1.000									
289.99	Acid Soluble Mo, Other (ppm)	1		0.3000									
291.30	Acid Soluble Ni, ICP (ppm)	3	2	0.7600	1.082	1.135		1.223	1.081	107.78%		1.010	15.69%
291.32	Acid Soluble Ni, ICP, 2006.03 (ppm)	1		1.000									
291.33	Acid Soluble Ni, ICP, 2017.02 (ppm)	1		2.440									
291.99	Acid Soluble Ni, Other (ppm)	1		0.1000									
301.30	Acid Soluble Se, ICP (ppm)	3	3	0.0867	0.1040	0.0867		0.1040	0.0750	119.96%		0.0707	22.00%
301.32	Acid Soluble Se, ICP, 2006.03 (ppm)	1		10.00									
301.99	Acid Soluble Se, Other (ppm)	1		0.3000									
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (%)	1		0.0000									
321.32	Acid Soluble Zn, ICP, test portion 2006.03A-C (%)	1		0.0003									
321.33	Acid Soluble Zn, ICP, 2017.02 (%)	2	0	0.0250	0.0354								
321.99	Acid Soluble Zn, Other (%)	2	0	0.0006	0.0006								

The Method IA Ratio =  $2.33 * \text{Robust SD} / \text{IA at the Method Assigned Value}$ . IA ratios of 1 and less indicate participant data dispersion is as good or less than the IA. Red indicates the IA ratio is significantly greater than 1, Orange indicates marginally greater than 1, Green indicates IA ratio is not significantly greater than 1 and Grey indicates < 6 labs reporting. The Horwitz %RSD is calculated using the Thompson Modification, Analyst,2000,125,385-386.



Method PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

Sample # 221031

Nitrogen Select PT Scheme

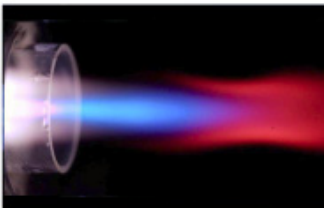
(NH4)2SO4

### Method Precision Report

Issue Date : 11/30/2022

Method Code	Analyte & Method	# Tests Submitted	# Tests Used in Precision Calcs	Mean	SD	Between Labs sL	Within Labs sr	Reproducibility sR	Between Labs %RSD	Within Labs %rsd	Reproducibility %RSD	sR/sr
001.99	Ammoniacal N, Other (%)	6	5	21.10	0.0613	0.0545	0.0397	0.0674	0.26%	0.19%	0.32%	1.697
010.60	Total N, Combustion (21%)	13	12	21.23	0.2477	0.2208	0.1588	0.2719	1.04%	0.75%	1.28%	1.712
148.99	Total S, Other (24%)	5	5	24.12	0.7493	0.7489	0.0354	0.7498	3.10%	0.15%	3.11%	21.21

Notes: Precision data calculated when 5 or more Tests included.



Method PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

# Methods: 49

Sample # 221031

Nitrogen Select PT Scheme

# Labs Reporting: 19

(NH4)2SO4

Lab Values

Issue Date : 11/30/2022

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Range				
001.10	Ammoniacal N, Magnesium Oxide Method (%)	0585	21.03	0.0300				1			0
001.99	Ammoniacal N, Other (%)	0220	20.70	0.1000	21.07	0.1125	0.0567	6	-2.92	NA	0
001.99	Ammoniacal N, Other (%)	0513	21.01	0.0200	21.07	0.1125	0.0567	6	-0.46	NA	0
001.99	Ammoniacal N, Other (%)	0585	21.09	0.0200	21.07	0.1125	0.0567	6	0.17	NA	0
001.99	Ammoniacal N, Other (%)	0493	21.10	0.1000	21.07	0.1125	0.0567	6	0.25	NA	0
001.99	Ammoniacal N, Other (%)	0027	21.14	0.0500	21.07	0.1125	0.0567	6	0.53	NA	0
001.99	Ammoniacal N, Other (%)	0586	21.18	0.0500	21.07	0.1125	0.0567	6	0.85	NA	0
010.17	Total N, Comprehensive (21%)	0585	21.03	0.0200				1			0
010.60	Total N, Combustion (21%)	0450	20.20	0.2000	21.18	0.2830	0.1585	13	-3.48	Low	0
010.60	Total N, Combustion (21%)	0494	20.91	0.3600	21.18	0.2830	0.1585	13	-0.97	OK	0
010.60	Total N, Combustion (21%)	0027	20.97	0.0400	21.18	0.2830	0.1585	13	-0.76	OK	0
010.60	Total N, Combustion (21%)	0561	21.06	0.0300	21.18	0.2830	0.1585	13	-0.46	OK	0
010.60	Total N, Combustion (21%)	0220	21.06	0.0400	21.18	0.2830	0.1585	13	-0.44	OK	0
010.60	Total N, Combustion (21%)	0042	21.10	0.4000	21.18	0.2830	0.1585	13	-0.30	OK	0
010.60	Total N, Combustion (21%)	0025	21.15	0.0700	21.18	0.2830	0.1585	13	-0.14	OK	0
010.60	Total N, Combustion (21%)	0405	21.23	0.0200	21.18	0.2830	0.1585	13	0.16	OK	0
010.60	Total N, Combustion (21%)	0040	21.25	0.1000	21.18	0.2830	0.1585	13	0.23	OK	0
010.60	Total N, Combustion (21%)	0073	21.33	0.0100	21.18	0.2830	0.1585	13	0.49	OK	0
010.60	Total N, Combustion (21%)	0421	21.44	0.5000	21.18	0.2830	0.1585	13	0.90	OK	0
010.60	Total N, Combustion (21%)	0594	21.55	0.1000	21.18	0.2830	0.1585	13	1.29	OK	0
010.60	Total N, Combustion (21%)	0593	21.75	0.1900	21.18	0.2830	0.1585	13	1.98	OK	0
010.99	Total N, Other (21%)	0371	21.00	0.2000	21.36	0.5532	0.0733	3	-0.66		0
010.99	Total N, Other (21%)	0585	21.09	0.0200	21.36	0.5532	0.0733	3	-0.49		0
010.99	Total N, Other (21%)	0576	22.00	0.0000	21.36	0.5532	0.0733	3	1.15		0
121.30	Acid Soluble Mg, ICP, test portion inorganic 965.09 (%)	0371	0.0005	0.0000				1			0
143.00	Elemental S, Gravimetric Sulfur - carbon disulfide soluble sulfu	0405	0.0300	0.0000				1			0
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	0494	21.23	0.1200	23.52	1.556	0.1550	4	-1.48		0
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	0561	23.98	0.4500	23.52	1.556	0.1550	4	0.29		0
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	0027	24.23	0.0400	23.52	1.556	0.1550	4	0.46		0
145.00	Sulfate S, HCl soluble, Gravimetric Sulfur - sulfate form (%)	0405	24.66	0.0100	23.52	1.556	0.1550	4	0.73		0
145.99	Sulfate S, HCl soluble, Other (%)	0593	23.50	0.1600				2			0
145.99	Sulfate S, HCl soluble, Other (%)	0586	23.60	0.1800				2			0

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Range				
148.00	Total S. Combustion (24%)	0073	22.99	0.7500	23.73	0.9485	0.3333	3	-0.79		0
148.00	Total S. Combustion (24%)	0593	23.42	0.2500	23.73	0.9485	0.3333	3	-0.34		0
148.00	Total S. Combustion (24%)	0594	24.80	0.0000	23.73	0.9485	0.3333	3	1.12		0
148.01	Total S. Gravimetric - sulfate and elemental (24%)	0494	21.28	0.0996	23.97	1.535	0.0479	5	-1.75		0
148.01	Total S. Gravimetric - sulfate and elemental (24%)	0585	24.13	0.0500	23.97	1.535	0.0479	5	0.10		0
148.01	Total S. Gravimetric - sulfate and elemental (24%)	0405	24.69	0.0100	23.97	1.535	0.0479	5	0.47		0
148.01	Total S. Gravimetric - sulfate and elemental (24%)	0513	24.84	0.0600	23.97	1.535	0.0479	5	0.57		0
148.01	Total S. Gravimetric - sulfate and elemental (24%)	0220	24.91	0.0200	23.97	1.535	0.0479	5	0.61		0
148.07	Total S. ICP, test portion as in 2017.02 (24%)	0040	24.15	0.1000	25.09	1.335	0.3017	4	-0.70		0
148.07	Total S. ICP, test portion as in 2017.02 (24%)	0494	24.39	0.6569	25.09	1.335	0.3017	4	-0.52		0
148.07	Total S. ICP, test portion as in 2017.02 (24%)	0513	24.76	0.0800	25.09	1.335	0.3017	4	-0.25		0
148.07	Total S. ICP, test portion as in 2017.02 (24%)	0421	27.06	0.3700	25.09	1.335	0.3017	4	1.47		0
148.99	Total S. Other (24%)	0576	23.00	0.0000	24.12	0.7493	0.0340	5	-1.50		0
148.99	Total S. Other (24%)	0585	24.00	0.0000	24.12	0.7493	0.0340	5	-0.16		0
148.99	Total S. Other (24%)	0371	24.05	0.1000	24.12	0.7493	0.0340	5	-0.10		0
148.99	Total S. Other (24%)	0450	24.57	0.0300	24.12	0.7493	0.0340	5	0.59		0
148.99	Total S. Other (24%)	0220	25.00	0.0400	24.12	0.7493	0.0340	5	1.17		0
151.30	Acid Soluble As, ICP (ppm)	0371	0.0050	0.0000				2			0
151.30	Acid Soluble As, ICP (ppm)	0594	0.2900	0.0800				2			0
151.30	Acid Soluble As, ICP (ppm)	0585	< 0.01					2			5
151.30	Acid Soluble As, ICP (ppm)	0586	< 1.4					2			5
151.32	Acid Soluble As, ICP, 2006.03 (ppm)	0405	< 3					0			5
151.99	Acid Soluble As, Other (ppm)	0220	0.6000	0.2000				1			0
181.30	Acid Soluble Cd, ICP (ppm)	0371	0.0045	0.0010				2			0
181.30	Acid Soluble Cd, ICP (ppm)	0586	5.500	3.000				2			0
181.30	Acid Soluble Cd, ICP (ppm)	0594	0.0000	0.0000				2			4
181.30	Acid Soluble Cd, ICP (ppm)	0585	< 0.01					2			5
181.32	Acid Soluble Cd, ICP, 2006.03 (ppm)	0405	< 1					0			5
181.99	Acid Soluble Cd, Other (ppm)	0220	< 0.1					0			5
191.30	Acid Soluble Cr, ICP (ppm)	0585	0.1200	0.0000	1.662	2.565	0.7528	4	-0.60		0
191.30	Acid Soluble Cr, ICP (ppm)	0594	0.5000	0.0000	1.662	2.565	0.7528	4	-0.45		0
191.30	Acid Soluble Cr, ICP (ppm)	0371	0.5295	0.0110	1.662	2.565	0.7528	4	-0.44		0
191.30	Acid Soluble Cr, ICP (ppm)	0586	5.500	3.000	1.662	2.565	0.7528	4	1.50		0
191.32	Acid Soluble Cr, ICP, 2006.03 (ppm)	0405	< 1					0			5
191.99	Acid Soluble Cr, Other (ppm)	0220	2.000	0.2000				1			0
202.30	Acid Soluble Co, ICP (ppm)	0371	0.0035	0.0030				2			0
202.30	Acid Soluble Co, ICP (ppm)	0586	3.000	2.000				2			0
202.30	Acid Soluble Co, ICP (ppm)	0594	0.0000	0.0000				2			4
202.30	Acid Soluble Co, ICP (ppm)	0585	< 0.01					2			5
202.32	Acid Soluble Co, ICP, 2006.03 (ppm)	0405	< 1					0			5
202.99	Acid Soluble Co, Other (ppm)	0220	< 0.1					0			5
221.30	Acid Soluble Cu, ICP, test portion inorganic 965.09 (%)	0371	0.0000	0.0000				0			4
221.32	Acid Soluble Cu, ICP, test portion 2006.03A-C (%)	0405	0.0006	0.0005				1			0

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Range				
221.33	Acid Soluble Cu, ICP, 2017.02 (%)	0594	0.0000	0.0000				0			4
221.99	Acid Soluble Cu, Other (%)	0585	< 0.0001					0			5
221.99	Acid Soluble Cu, Other (%)	0586	< 0.001					0			5
241.30	Acid Soluble Fe, ICP, test portion inorganic 965.09 (%)	0371	0.0009	0.0001				1			0
251.30	Acid Soluble Pb, ICP (ppm)	0371	0.0015	0.0010				2			0
251.30	Acid Soluble Pb, ICP (ppm)	0586	4.500	3.000				2			0
251.30	Acid Soluble Pb, ICP (ppm)	0594	0.0000	0.0000				2			4
251.30	Acid Soluble Pb, ICP (ppm)	0585	< 0.01					2			5
251.32	Acid Soluble Pb, ICP, 2006.03 (ppm)	0405	< 4					0			5
261.32	Acid Soluble Mn, ICP, test portion inorganic 965.09 (%)	0371	0.0000	0.0000				0			4
281.30	Acid Soluble Hg, ICP (ppm)	0371	0.0030	0.0040				1			0
281.30	Acid Soluble Hg, ICP (ppm)	0585	< 0.01					1			5
281.30	Acid Soluble Hg, ICP (ppm)	0405	< 2					1			5
281.99	Acid Soluble Hg, Other (ppm)	0220	< 0.01					0			5
289.30	Acid Soluble Mo, ICP (ppm)	0585	0.0450	0.0100	2.640	4.426	1.180	3	-0.59		0
289.30	Acid Soluble Mo, ICP (ppm)	0594	0.1250	0.0300	2.640	4.426	1.180	3	-0.57		0
289.30	Acid Soluble Mo, ICP (ppm)	0586	7.750	3.500	2.640	4.426	1.180	3	1.15		0
289.32	Acid Soluble Mo, ICP, 2006.03 (ppm)	0405	< 1					0			5
289.99	Acid Soluble Mo, Other (ppm)	0220	< 0.3					0			5
291.30	Acid Soluble Ni, ICP (ppm)	0594	0.2700	0.0200				2			0
291.30	Acid Soluble Ni, ICP (ppm)	0586	2.000	2.000				2			0
291.30	Acid Soluble Ni, ICP (ppm)	0585	< 0.01					2			5
291.32	Acid Soluble Ni, ICP, 2006.03 (ppm)	0405	< 1					0			5
291.33	Acid Soluble Ni, ICP, 2017.02 (ppm)	0494	2.440	0.3400				1			0
291.99	Acid Soluble Ni, Other (ppm)	0220	< 0.1					0			5
301.30	Acid Soluble Se, ICP (ppm)	0371	0.0100	0.0120	0.0867	0.1040	0.0707	3	-0.74		0
301.30	Acid Soluble Se, ICP (ppm)	0585	0.0450	0.0300	0.0867	0.1040	0.0707	3	-0.40		0
301.30	Acid Soluble Se, ICP (ppm)	0594	0.2050	0.1700	0.0867	0.1040	0.0707	3	1.14		0
301.32	Acid Soluble Se, ICP, 2006.03 (ppm)	0405	< 10					0			5
301.99	Acid Soluble Se, Other (ppm)	0220	< 0.3					0			5
321.30	Acid Soluble Zn, ICP, test portion inorganic 965.09 (%)	0371	0.0000	0.0000				0			4
321.32	Acid Soluble Zn, ICP, test portion 2006.03A-C (%)	0405	< 0.0003					0			5
321.33	Acid Soluble Zn, ICP, 2017.02 (%)	0594	0.0000	0.0000				0			4
321.33	Acid Soluble Zn, ICP, 2017.02 (%)	0593	< 0.05					0			5
321.99	Acid Soluble Zn, Other (%)	0585	< 0.0001					0			5
321.99	Acid Soluble Zn, Other (%)	0586	< 0.001					0			5

### Interpreting Z Scores and Flags:

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, 3 = removed from stats, 4 = rejected due to 0s submitted and 5 = LOD. A 9 flag indicates a data problem - scores not calculated.

### Notes:

Robust statistics not used if < 6 labs used in calculations, in this case Values and Z Scores are grayed out and should be interpreted with extreme caution. IA Status describes where your result is relative to the Assigned Value ± IA. Red indicates Higher or Lower and Green indicates within the IA range about the Robust mean. Method codes in light

Method Code	Analyte Name and Method (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Method IA Status	Flag
			Value	Range	Rob Mean	Rob SD	Range				

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.