

Analyte PT For All Labs  
 Sample # 230851  
 K-Mg-SO4

**Magruder Fertilizer Proficiency Testing Program**  
**Potassium Select PT Scheme**  
**Statistical Summary**

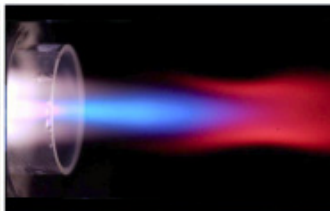
# Analytes: 27  
 # Labs Reporting: 12  
 Issue Date : 09/30/2023

Analyte Code	Analyte Sample # 230851	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Analyte Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Analyte IA Ratio	Average Range (R-bar)	Horwitz %RSD
050	Soluble K2O (21.5%)	14	14	22.76	1.446	22.61	1.1682	1.119	0.3740	4.95%	2.23	0.2148	2.10%
101	Acid Soluble Ca (%)	1		0.1093									
121	Acid Soluble Mg (10.8%)	8	8	11.19	0.4727	11.22	0.7608	0.4864	0.2150	4.34%	1.49	0.4768	2.78%
131	Water Soluble Mg (%)	1		11.25									
143	Elemental S (%)	1		0.0200									
145	Sulfate S, HCl soluble (%)	3	3	23.23	0.4217	23.23		0.4217	0.3044	1.82%		0.0367	2.07%
148	Total S (22%)	7	6	22.84	0.5558	22.79	1.0000	0.6649	0.3393	2.92%	1.55	0.1440	2.09%
149	S - HNO3 soluble (%)	1		23.81									
151	Acid Soluble As (ppm)	4	0	1.355	1.179	22.79		0.6649		2.92%		0.0200	9.99%
165	Acid Soluble B (%)	2	0	0.0055	0.0064								
171	Water Soluble B (%)	2	0	0.0055	0.0064								
181	Acid Soluble Cd (ppm)	7	3	0.5113	0.4588	0.1363		0.0628	0.0453	46.08%		0.0081	21.59%
190	Water Soluble Cl (1.5%)	6	5	0.8612	0.2119	0.8795	0.0929	0.2315	0.1294	26.33%	5.80	0.0074	4.08%
191	Acid Soluble Cr (ppm)	7	3	2.204	1.915	1.169		0.1493	0.1078	12.78%		0.3612	15.63%
202	Acid Soluble Co (ppm)	7	3	1.745	2.247	0.1722	1.0517	0.1251	0.0903	72.62%	0.28	0.1294	20.85%
221	Acid Soluble Cu (%)	5	1	0.6883	1.538	0.1722	0.0222	0.1251	0.1563	72.62%	13.11	0.0000	5.21%
241	Acid Soluble Fe (%)	3	3	0.0071	0.0016	0.0071	0.0057	0.0016	0.0011	22.31%	0.65	0.0003	8.42%
251	Acid Soluble Pb (ppm)	7	1	3.213	3.462	0.0071		0.0016	0.0020	22.31%		0.0002	22.00%
261	Acid Soluble Mn (%)	2	2	0.0007	0.0000								
271	Water Soluble Mn (%)	2	0	0.0005	0.0000								
281	Acid Soluble Hg (ppm)	4	1	0.5055	0.9963	0.0007		0.0000	0.0000	5.24%		0.0001	22.00%
289	Acid Soluble Mo (ppm)	5	2	2.398	4.260	0.3443	1.1033	0.1495	0.1321	43.42%	0.32	0.1042	18.78%
291	Acid Soluble Ni (ppm)	7	4	2.701	3.600	0.8842		0.4365	0.2728	49.37%		0.4203	16.30%
301	Acid Soluble Se (ppm)	4	0	2.900	4.745	0.8842		0.4365		49.37%		0.1000	16.30%
311	Sodium (%)	3	3	0.4054	0.1384	0.4054	0.0455	0.1384	0.0999	34.15%	7.08	0.0025	4.58%
321	Acid Soluble Zn (%)	7	3	0.4659	1.231	1.086	0.1136	1.881	1.358	173.15%	38.57	0.3967	3.95%
325	Water Soluble Zn (%)	2	0	0.0005	0.0000								

The Analyte IA Ratio = 2.33 \* Robust SD / IA at the Analyte 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.

Analyte Code	Analyte Sample # 230851	# Tests Submitted	# Tests in Robust Calculations	Raw Mean	Raw SD	Assigned Value Robust Mean	IA at Analyte Value	Robust sd	Robust Uncertainty (U)	Robust % RSD	Analyte IA Ratio	Average Range (R-bar)	Horwitz %RSD
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The Horwitz %RSD is calculated using the Thompson Modification, Analyst, 2000, 125, 385-386.



Analyte PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

# Analytes: 27

Sample # 230851

Potassium Select PT Scheme

# Labs Reporting: 12

K-Mg-SO4

Lab Values

Issue Date : 09/30/2023

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
050	Soluble K2O (21.5%)	0611	20.50†	0.6000	22.61	1.119	0.2148	14	-1.88	050.99	0
050	Soluble K2O (21.5%)	0615	21.50	0.2000	22.61	1.119	0.2148	14	-0.99	050.99	0
050	Soluble K2O (21.5%)	0405	21.59	0.0000	22.61	1.119	0.2148	14	-0.91	050.00	0
050	Soluble K2O (21.5%)	0040	22.25	0.1000	22.61	1.119	0.2148	14	-0.32	050.52	0
050	Soluble K2O (21.5%)	0494	22.27	0.1200	22.61	1.119	0.2148	14	-0.30	050.00	0
050	Soluble K2O (21.5%)	0597	22.29	0.1300	22.61	1.119	0.2148	14	-0.29	050.00	0
050	Soluble K2O (21.5%)	0561	22.30	0.2100	22.61	1.119	0.2148	14	-0.28	050.00	0
050	Soluble K2O (21.5%)	0220	22.53	0.0800	22.61	1.119	0.2148	14	-0.07	050.00	0
050	Soluble K2O (21.5%)	0590	22.53	0.0200	22.61	1.119	0.2148	14	-0.07	050.99	0
050	Soluble K2O (21.5%)	0626	22.95	0.0500	22.61	1.119	0.2148	14	0.30	050.00	0
050	Soluble K2O (21.5%)	0626	23.18	0.0100	22.61	1.119	0.2148	14	0.51	050.99	0
050	Soluble K2O (21.5%)	0494	23.64	0.0700	22.61	1.119	0.2148	14	0.92	050.52	0
050	Soluble K2O (21.5%)	0086	24.72‡	0.7287	22.61	1.119	0.2148	14	1.89	050.50	0
050	Soluble K2O (21.5%)	0042	26.40‡	0.6000	22.61	1.119	0.2148	14	3.39	050.99	0
101	Acid Soluble Ca (%)	0494	0.1093	0.0022				1		101.33	0
121	Acid Soluble Mg (10.8%)	0040	10.32†	1.290	11.22	0.4864	0.4768	8	-1.69	121.33	0
121	Acid Soluble Mg (10.8%)	0405	10.95	0.1000	11.22	0.4864	0.4768	8	-0.50	121.32	0
121	Acid Soluble Mg (10.8%)	0042	11.08	0.9600	11.22	0.4864	0.4768	8	-0.26	121.99	0
121	Acid Soluble Mg (10.8%)	0220	11.17	0.2500	11.22	0.4864	0.4768	8	-0.10	121.30	0
121	Acid Soluble Mg (10.8%)	0494	11.18	0.2439	11.22	0.4864	0.4768	8	-0.07	121.33	0
121	Acid Soluble Mg (10.8%)	0561	11.32	0.2300	11.22	0.4864	0.4768	8	0.19	121.33	0
121	Acid Soluble Mg (10.8%)	0626	11.67	0.0000	11.22	0.4864	0.4768	8	0.85	121.70	0
121	Acid Soluble Mg (10.8%)	0086	11.88	0.3568	11.22	0.4864	0.4768	8	1.26	121.33	0
131	Water Soluble Mg (%)	0626	11.25	0.0600				1		131.70	0
143	Elemental S (%)	0405	0.0200	0.0000				1		143.00	0
145	Sulfate S, HCl soluble (%)	0405	22.86	0.0400	23.23	0.4217	0.0367	3	-0.88	145.00	0
145	Sulfate S, HCl soluble (%)	0561	23.15	0.0100	23.23	0.4217	0.0367	3	-0.21	145.00	0
145	Sulfate S, HCl soluble (%)	0220	23.69	0.0600	23.23	0.4217	0.0367	3	1.09	145.00	0
148	Total S (22%)	0597	22.02	0.3800	22.79	0.6649	0.1440	6	-1.03	148.99	0
148	Total S (22%)	0405	22.45	0.1000	22.79	0.6649	0.1440	6	-0.45	148.00	0
148	Total S (22%)	0626	22.54	0.1000	22.79	0.6649	0.1440	6	-0.33	148.01	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
148	Total S (22%)	0405	22.88	0.0400	22.79	0.6649	0.1440	6	0.12	148.99	0
148	Total S (22%)	0040	23.15	0.1000	22.79	0.6649	0.1440	6	0.48	148.07	0
148	Total S (22%)	0220	23.69	0.0000	22.79	0.6649	0.1440	6	1.21	148.99	0
148	Total S (22%)	0494	23.18	1.949	22.79	0.6649	0.1440	6	0.53	148.07	1
149	S - HNO3 soluble (%)	0086	23.81	0.7611				1		149.04	0
151	Acid Soluble As (ppm)	0220	< 0.5					0		151.99	5
151	Acid Soluble As (ppm)	0626	< 0.5					0		151.99	5
151	Acid Soluble As (ppm)	0494	< 1.42					0		151.33	5
151	Acid Soluble As (ppm)	0405	< 3					0		151.32	5
165	Acid Soluble B (%)	0626	< 0.001					0		165.30	5
165	Acid Soluble B (%)	0626	< 0.01					0		165.00	5
171	Water Soluble B (%)	0626	< 0.001					0		171.99	5
171	Water Soluble B (%)	0626	< 0.01					0		171.10	5
181	Acid Soluble Cd (ppm)	0220	0.1000	0.0000	0.1363	0.0628	0.0081	3	-0.47	181.32	0
181	Acid Soluble Cd (ppm)	0220	0.1000	0.0000	0.1363	0.0628	0.0081	3	-0.47	181.99	0
181	Acid Soluble Cd (ppm)	0086	0.2088	0.0081	0.1363	0.0628	0.0081	3	0.94	181.33	0
181	Acid Soluble Cd (ppm)	0494	< 0.17		0.1363	0.0628	0.0081	3		181.33	5
181	Acid Soluble Cd (ppm)	0626	< 1		0.1363	0.0628	0.0081	3		181.00	5
181	Acid Soluble Cd (ppm)	0405	< 1		0.1363	0.0628	0.0081	3		181.32	5
181	Acid Soluble Cd (ppm)	0626	< 1		0.1363	0.0628	0.0081	3		181.99	5
190	Water Soluble Cl (1.5%)	0220	0.7450†	0.0100	0.8795	0.2315	0.0074	5	-0.51	190.00	0
190	Water Soluble Cl (1.5%)	0626	0.7497†	0.0009	0.8795	0.2315	0.0074	5	-0.49	190.99	0
190	Water Soluble Cl (1.5%)	0626	0.7499†	0.0008	0.8795	0.2315	0.0074	5	-0.49	190.00	0
190	Water Soluble Cl (1.5%)	0561	0.8700	0.0000	0.8795	0.2315	0.0074	5	-0.04	190.00	0
190	Water Soluble Cl (1.5%)	0405	1.283‡	0.0179	0.8795	0.2315	0.0074	5	1.52	190.00	0
190	Water Soluble Cl (1.5%)	0611	0.7700†	0.0800	0.8795	0.2315	0.0074	5	-0.41	190.99	1
191	Acid Soluble Cr (ppm)	0086	1.006	0.1223	1.169	0.1493	0.3612	3	-0.88	191.33	0
191	Acid Soluble Cr (ppm)	0220	1.200	0.0000	1.169	0.1493	0.3612	3	0.17	191.99	0
191	Acid Soluble Cr (ppm)	0220	1.300	0.6000	1.169	0.1493	0.3612	3	0.71	191.32	0
191	Acid Soluble Cr (ppm)	0494	< 0.92		1.169	0.1493	0.3612	3		191.33	5
191	Acid Soluble Cr (ppm)	0405	< 1		1.169	0.1493	0.3612	3		191.32	5
191	Acid Soluble Cr (ppm)	0626	< 5		1.169	0.1493	0.3612	3		191.00	5
191	Acid Soluble Cr (ppm)	0626	< 5		1.169	0.1493	0.3612	3		191.30	5
202	Acid Soluble Co (ppm)	0220	0.1000	0.0000	0.1722	0.1251	0.1294	3	-0.47	202.32	0
202	Acid Soluble Co (ppm)	0220	0.1000	0.0000	0.1722	0.1251	0.1294	3	-0.47	202.99	0
202	Acid Soluble Co (ppm)	0086	0.3166	0.1294	0.1722	0.1251	0.1294	3	0.94	202.33	0
202	Acid Soluble Co (ppm)	0494	< 0.7		0.1722	0.1251	0.1294	3		202.33	5
202	Acid Soluble Co (ppm)	0405	< 1		0.1722	0.1251	0.1294	3		202.32	5
202	Acid Soluble Co (ppm)	0626	< 5		0.1722	0.1251	0.1294	3		202.00	5
202	Acid Soluble Co (ppm)	0626	< 5		0.1722	0.1251	0.1294	3		202.30	5
221	Acid Soluble Cu (%)	0086	3.440	0.2536				1		221.33	0
221	Acid Soluble Cu (%)	0405	< 0.0002					1		221.32	5
221	Acid Soluble Cu (%)	0494	< 0.0002					1		221.33	5

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
221	Acid Soluble Cu (%)	0626	< 0.0005					1		221.00	5
221	Acid Soluble Cu (%)	0626	< 0.0005					1		221.33	5
241	Acid Soluble Fe (%)	0626	0.0062	0.0002	0.0071	0.0016	0.0003	3	-0.58	241.00	0
241	Acid Soluble Fe (%)	0626	0.0062	0.0004	0.0071	0.0016	0.0003	3	-0.58	241.33	0
241	Acid Soluble Fe (%)	0494	0.0090	0.0003	0.0071	0.0016	0.0003	3	1.15	241.33	0
251	Acid Soluble Pb (ppm)	0086	1.174	0.2596				1		251.33	0
251	Acid Soluble Pb (ppm)	0220	< 0.7					1		251.32	5
251	Acid Soluble Pb (ppm)	0220	< 0.7					1		251.99	5
251	Acid Soluble Pb (ppm)	0494	< 0.92					1		251.33	5
251	Acid Soluble Pb (ppm)	0405	< 4					1		251.32	5
251	Acid Soluble Pb (ppm)	0626	< 5					1		251.30	5
251	Acid Soluble Pb (ppm)	0626	< 10					1		251.00	5
261	Acid Soluble Mn (%)	0626	0.0007	0.0001				2		261.35	0
261	Acid Soluble Mn (%)	0626	0.0007	0.0000				2		261.11	0
271	Water Soluble Mn (%)	0626	< 0.0005					0		271.00	5
271	Water Soluble Mn (%)	0626	< 0.0005					0		271.30	5
281	Acid Soluble Hg (ppm)	0626	0.0022	0.0001				1		281.99	0
281	Acid Soluble Hg (ppm)	0626	< 0.01					1		281.00	5
281	Acid Soluble Hg (ppm)	0220	< 0.01					1		281.99	5
281	Acid Soluble Hg (ppm)	0405	< 2					1		281.30	5
289	Acid Soluble Mo (ppm)	0086	0.2386	0.1084				2		289.33	0
289	Acid Soluble Mo (ppm)	0220	0.4500	0.1000				2		289.99	0
289	Acid Soluble Mo (ppm)	0220	< 0.3					2		289.32	5
289	Acid Soluble Mo (ppm)	0405	< 1					2		289.32	5
289	Acid Soluble Mo (ppm)	0626	< 10					2		289.30	5
291	Acid Soluble Ni (ppm)	0220	0.5500	0.1000	0.8842	0.4365	0.4203	4	-0.65	291.99	0
291	Acid Soluble Ni (ppm)	0220	0.6000	0.4000	0.8842	0.4365	0.4203	4	-0.55	291.32	0
291	Acid Soluble Ni (ppm)	0086	0.8867	0.1812	0.8842	0.4365	0.4203	4	0.00	291.33	0
291	Acid Soluble Ni (ppm)	0405	1.500	1.000	0.8842	0.4365	0.4203	4	1.20	291.32	0
291	Acid Soluble Ni (ppm)	0494	< 0.37		0.8842	0.4365	0.4203	4		291.33	5
291	Acid Soluble Ni (ppm)	0626	< 5		0.8842	0.4365	0.4203	4		291.30	5
291	Acid Soluble Ni (ppm)	0626	< 10		0.8842	0.4365	0.4203	4		291.00	5
301	Acid Soluble Se (ppm)	0220	< 0.3					0		301.32	5
301	Acid Soluble Se (ppm)	0220	< 0.3					0		301.99	5
301	Acid Soluble Se (ppm)	0626	< 1					0		301.00	5
301	Acid Soluble Se (ppm)	0405	< 10					0		301.32	5
311	Sodium (%)	0611	0.2500	0.0000	0.4054	0.1384	0.0025	3	-1.12	311.99	0
311	Sodium (%)	0494	0.4508	0.0040	0.4054	0.1384	0.0025	3	0.33	311.33	0
311	Sodium (%)	0626	0.5155	0.0010	0.4054	0.1384	0.0025	3	0.80	311.30	0
321	Acid Soluble Zn (%)	0220	0.0003	0.0003	1.086	1.881	0.3967	3	-0.47	321.32	0
321	Acid Soluble Zn (%)	0220	0.0005	0.0000	1.086	1.881	0.3967	3	-0.47	321.99	0
321	Acid Soluble Zn (%)	0086	3.259	0.7931	1.086	1.881	0.3967	3	0.94	321.33	0
321	Acid Soluble Zn (%)	0405	< 0.0003		1.086	1.881	0.3967	3		321.32	5

Analyte Group	Analyte (Units)	Lab Code	Lab Data		*Robust Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	Rob R-bar				
321	Acid Soluble Zn (%)	0626	< 0.0005		1.086	1.881	0.3967	3		321.00	5
321	Acid Soluble Zn (%)	0494	< 0.0005		1.086	1.881	0.3967	3		321.33	5
321	Acid Soluble Zn (%)	0626	< 0.0005		1.086	1.881	0.3967	3		321.33	5
325	Water Soluble Zn (%)	0626	< 0.0005					0		325.00	5
325	Water Soluble Zn (%)	0626	< 0.0005					0		325.30	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. Identical duplicates not included in calculation of Rob R-bar. Your offset values are higher (‡) or lower (†) than the Robust Analyte value ± Investigational Allowance. 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.