

Analyte PT For All Labs  
 Sample # 230341  
 Phosphate Rock

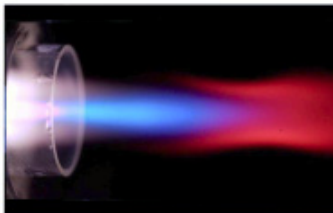
**Magruder Fertilizer Proficiency Testing Program**  
**Phosphorous Select PT Scheme**  
**Statistical Summary**

# Analytes: 26  
 # Labs Reporting: 12  
 Issue Date : 04/30/2023

Analyte Code	Analyte Sample # 230341	# 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
010	Total N (%)	1		0.0100									
020	Total P2O5 (%)	9	9	27.02	0.9535	27.02		1.081	0.4505	4.00%		0.6576	1.92%
030	Citrate Insoluble P2O5 (%)	2	2	19.56	4.409								
040	Indirect Available P2O5 (%)	1		9.810									
041	Direct Available P2O5 (%)	4	4	10.92	3.806	10.92	0.6900	3.806	2.378	34.87%	12.85	0.4900	2.79%
048	Water Soluble P2O5 (%)	1		3.228									
050	Soluble K2O (%)	3	3	0.7734	1.155	0.7734	0.4100	1.155	0.8339	149.40%	6.57	0.0292	4.16%
060	Water (Free) (%)	1		0.5350									
101	Acid Soluble Ca (%)	8	8	23.89	9.178	26.34	1.0000	3.324	1.469	12.62%	7.75	0.3690	1.95%
121	Acid Soluble Mg (%)	8	7	0.9443	1.541	0.4435	0.2222	0.1021	0.0483	23.03%	1.07	0.0051	4.52%
148	Total S (%)	2	2	1.206	0.5171								
151	Acid Soluble As (ppm)	8	7	14.81	6.759	16.85		5.016	2.370	29.77%		0.6731	10.46%
165	Acid Soluble B (%)	1		0.0100									
181	Acid Soluble Cd (ppm)	8	7	7.276	3.162	8.253		2.127	1.005	25.77%		0.4759	11.64%
191	Acid Soluble Cr (ppm)	8	8	52.21	23.47	53.13		24.50	10.83	46.12%		2.415	8.80%
202	Acid Soluble Co (ppm)	8	6	3.321	3.640	3.291	1.9873	2.193	1.119	66.63%	2.57	0.1045	13.37%
221	Acid Soluble Cu (%)	9	5	0.2255	0.6655	0.0035	0.0054	0.0047	0.0026	133.85%	2.06	0.0000	9.35%
241	Acid Soluble Fe (%)	2	2	0.8328	0.0322								
251	Acid Soluble Pb (ppm)	8	5	9.262	8.027	8.209		2.401	1.342	29.24%		0.3952	11.65%
261	Acid Soluble Mn (%)	2	2	0.0152	0.0001								
281	Acid Soluble Hg (ppm)	5	3	0.4183	0.8845	0.0302		0.0304	0.0220	100.72%		0.0008	22.00%
289	Acid Soluble Mo (ppm)	7	5	6.670	4.355	9.118	3.7355	1.457	0.8143	15.97%	0.91	0.5535	11.47%
291	Acid Soluble Ni (ppm)	7	6	12.33	6.084	12.31		7.557	3.857	61.41%		0.5646	10.96%
301	Acid Soluble Se (ppm)	4	1	3.503	4.493	12.31		7.557	9.447	61.41%		0.1000	10.96%
311	Sodium (%)	2	2	0.5801	0.0285								
321	Acid Soluble Zn (%)	9	6	2.953	8.830	0.0078	0.0058	0.0075	0.0038	96.55%	3.03	0.0018	8.31%

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. The Horwitz %RSD is calculated using the Thompson Modification, Analyst,2000,125,385-386.

Horwitz %RSD
Average Range (R-bar)
Analyte IA Ratio
Robust % RSD
Robust Uncertainty (U)
Robust sd
IA at Analyte Value
Assigned Value Robust Mean
Raw SD
Raw Mean
# Tests in Robust Calculations
# Tests Submitted
Analyte Sample # 230341
Analyte Code



Analyte PT For All Labs

### Magruder Fertilizer Proficiency Testing Program

# Analytes: 26

Sample # 230341

Phosphorous Select PT Scheme

# Labs Reporting: 12

Phosphate Rock

Lab Values

Issue Date : 04/30/2023

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
010	Total N (%)	0527	< 0.01					0		010.60	5
020	Total P2O5 (%)	0586	26.02	0.1900	27.02	1.081	0.6576	9	-0.86	020.40	0
020	Total P2O5 (%)	0405	26.25	0.0900	27.02	1.081	0.6576	9	-0.66	020.20	0
020	Total P2O5 (%)	0042	26.25	0.5000	27.02	1.081	0.6576	9	-0.66	020.40	0
020	Total P2O5 (%)	0096	26.25	0.0600	27.02	1.081	0.6576	9	-0.66	020.40	0
020	Total P2O5 (%)	0615	26.45	0.5000	27.02	1.081	0.6576	9	-0.49	020.20	0
020	Total P2O5 (%)	0494	27.59	2.310	27.02	1.081	0.6576	9	0.48	020.10	0
020	Total P2O5 (%)	0547	27.80	0.4000	27.02	1.081	0.6576	9	0.67	020.20	0
020	Total P2O5 (%)	0527	28.19	0.2046	27.02	1.081	0.6576	9	1.00	020.50	0
020	Total P2O5 (%)	0368	28.38	1.664	27.02	1.081	0.6576	9	1.16	020.50	0
030	Citrate Insoluble P2O5 (%)	0096	16.44	0.1000				2		030.40	0
030	Citrate Insoluble P2O5 (%)	0586	22.68	0.6300				2		030.40	0
040	Indirect Available P2O5 (%)	0096	9.810	0.1600				1		040.40	0
041	Direct Available P2O5 (%)	0494	7.125	0.8900	10.92	3.806	0.4900	4	-1.00	041.10	0
041	Direct Available P2O5 (%)	0405	9.050	0.0400	10.92	3.806	0.4900	4	-0.49	041.11	0
041	Direct Available P2O5 (%)	0040	11.55	0.3000	10.92	3.806	0.4900	4	0.17	041.51	0
041	Direct Available P2O5 (%)	0494	15.94	0.7300	10.92	3.806	0.4900	4	1.32	041.51	0
048	Water Soluble P2O5 (%)	0086	3.228	0.6486				1		048.10	0
050	Soluble K2O (%)	0494	0.0800	0.0200	0.7734	1.155	0.0292	3	-0.60	050.52	0
050	Soluble K2O (%)	0527	0.1330	0.0047	0.7734	1.155	0.0292	3	-0.55	050.99	0
050	Soluble K2O (%)	0086	2.107	0.0630	0.7734	1.155	0.0292	3	1.15	050.50	0
060	Water (Free) (%)	0096	0.5350	0.2700				1		060.00	0
101	Acid Soluble Ca (%)	0405	1.798	0.0030	26.34	3.324	0.3690	8	-6.75	101.32	0
101	Acid Soluble Ca (%)	0494	23.17	0.7300	26.34	3.324	0.3690	8	-0.87	101.33	0
101	Acid Soluble Ca (%)	0042	24.77	0.4400	26.34	3.324	0.3690	8	-0.43	101.99	0
101	Acid Soluble Ca (%)	0586	26.91	0.3000	26.34	3.324	0.3690	8	0.16	101.99	0
101	Acid Soluble Ca (%)	0096	27.89	0.2300	26.34	3.324	0.3690	8	0.43	101.30	0
101	Acid Soluble Ca (%)	0368	28.49	0.6197	26.34	3.324	0.3690	8	0.59	101.99	0
101	Acid Soluble Ca (%)	0040	28.54	0.3600	26.34	3.324	0.3690	8	0.61	101.33	0
101	Acid Soluble Ca (%)	0527	29.59	0.2696	26.34	3.324	0.3690	8	0.89	101.33	0
121	Acid Soluble Mg (%)	0096	0.0047	0.0001	0.4435	0.1021	0.0051	7	-3.88	121.30	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
121	Acid Soluble Mg (%)	0042	0.3950	0.0060	0.4435	0.1021	0.0051	7	-0.43	121.99	0
121	Acid Soluble Mg (%)	0040	0.4200	0.0000	0.4435	0.1021	0.0051	7	-0.21	121.00	0
121	Acid Soluble Mg (%)	0368	0.4462	0.0024	0.4435	0.1021	0.0051	7	0.02	121.99	0
121	Acid Soluble Mg (%)	0494	0.4750	0.0100	0.4435	0.1021	0.0051	7	0.28	121.33	0
121	Acid Soluble Mg (%)	0527	0.5001	0.0008	0.4435	0.1021	0.0051	7	0.50	121.33	0
121	Acid Soluble Mg (%)	0405	0.5781	0.0113	0.4435	0.1021	0.0051	7	1.19	121.32	0
121	Acid Soluble Mg (%)	0586	4.735	0.1700	0.4435	0.1021	0.0051	7	37.99	121.99	1
148	Total S (%)	0494	0.8400	0.0200				2		148.07	0
148	Total S (%)	0527	1.571	0.0055				2		148.07	0
151	Acid Soluble As (ppm)	0042	6.819	0.3570	16.85	5.016	0.6731	7	-1.81	151.99	0
151	Acid Soluble As (ppm)	0527	15.18	0.1817	16.85	5.016	0.6731	7	-0.30	151.33	0
151	Acid Soluble As (ppm)	0586	16.00	0.0000	16.85	5.016	0.6731	7	-0.15	151.30	0
151	Acid Soluble As (ppm)	0096	16.75	0.3000	16.85	5.016	0.6731	7	-0.02	151.32	0
151	Acid Soluble As (ppm)	0593	17.00	0.4000	16.85	5.016	0.6731	7	0.03	151.30	0
151	Acid Soluble As (ppm)	0368	19.95	1.300	16.85	5.016	0.6731	7	0.56	151.34	0
151	Acid Soluble As (ppm)	0494	23.75	1.500	16.85	5.016	0.6731	7	1.24	151.33	0
151	Acid Soluble As (ppm)	0405	< 3		16.85	5.016	0.6731	7		151.32	5
165	Acid Soluble B (%)	0527	< 0.01					0		165.99	5
181	Acid Soluble Cd (ppm)	0586	4.500	1.000	8.253	2.127	0.4759	7	-1.60	181.30	0
181	Acid Soluble Cd (ppm)	0042	6.820	0.1200	8.253	2.127	0.4759	7	-0.61	181.99	0
181	Acid Soluble Cd (ppm)	0096	7.800	1.000	8.253	2.127	0.4759	7	-0.19	181.32	0
181	Acid Soluble Cd (ppm)	0368	8.900	0.6000	8.253	2.127	0.4759	7	0.28	181.34	0
181	Acid Soluble Cd (ppm)	0494	8.945	0.1900	8.253	2.127	0.4759	7	0.29	181.33	0
181	Acid Soluble Cd (ppm)	0527	9.494	0.3216	8.253	2.127	0.4759	7	0.53	181.33	0
181	Acid Soluble Cd (ppm)	0593	10.75	0.1000	8.253	2.127	0.4759	7	1.06	181.30	0
181	Acid Soluble Cd (ppm)	0405	< 1		8.253	2.127	0.4759	7		181.32	5
191	Acid Soluble Cr (ppm)	0405	9.000	0.0000	53.13	24.50	2.415	8	-1.65	191.32	0
191	Acid Soluble Cr (ppm)	0042	22.27	2.030	53.13	24.50	2.415	8	-1.15	191.99	0
191	Acid Soluble Cr (ppm)	0368	57.60	2.400	53.13	24.50	2.415	8	0.17	191.34	0
191	Acid Soluble Cr (ppm)	0494	59.75	2.500	53.13	24.50	2.415	8	0.25	191.33	0
191	Acid Soluble Cr (ppm)	0096	61.00	3.800	53.13	24.50	2.415	8	0.29	191.30	0
191	Acid Soluble Cr (ppm)	0586	64.00	4.000	53.13	24.50	2.415	8	0.41	191.30	0
191	Acid Soluble Cr (ppm)	0527	70.13	0.1770	53.13	24.50	2.415	8	0.63	191.33	0
191	Acid Soluble Cr (ppm)	0593	73.90	2.000	53.13	24.50	2.415	8	0.78	191.30	0
202	Acid Soluble Co (ppm)	0042	1.197	0.0820	3.291	2.193	0.1045	6	-0.85	202.99	0
202	Acid Soluble Co (ppm)	0096	1.550	0.1000	3.291	2.193	0.1045	6	-0.71	202.30	0
202	Acid Soluble Co (ppm)	0494	3.035	0.1300	3.291	2.193	0.1045	6	-0.10	202.33	0
202	Acid Soluble Co (ppm)	0593	3.500	0.2000	3.291	2.193	0.1045	6	0.08	202.30	0
202	Acid Soluble Co (ppm)	0527	3.884	0.0104	3.291	2.193	0.1045	6	0.24	202.33	0
202	Acid Soluble Co (ppm)	0368	11.80	0.0000	3.291	2.193	0.1045	6	3.46	202.34	0
202	Acid Soluble Co (ppm)	0586	< 0.6		3.291	2.193	0.1045	6		202.30	5
202	Acid Soluble Co (ppm)	0405	< 1		3.291	2.193	0.1045	6		202.32	5
221	Acid Soluble Cu (%)	0368	0.0011	0.0000	0.0035	0.0047	0.0000	5	-0.45	221.99	0

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
221	Acid Soluble Cu (%)	0494	0.0013	0.0000	0.0035	0.0047	0.0000	5	-0.41	221.33	0
221	Acid Soluble Cu (%)	0527	0.0014	0.0000	0.0035	0.0047	0.0000	5	-0.39	221.33	0
221	Acid Soluble Cu (%)	0040	0.0019	0.0000	0.0035	0.0047	0.0000	5	-0.30	221.00	0
221	Acid Soluble Cu (%)	0042	0.0120	0.0000	0.0035	0.0047	0.0000	5	1.56	221.99	0
221	Acid Soluble Cu (%)	0096	0.0016	0.0001	0.0035	0.0047	0.0000	5	-0.37	221.30	1
221	Acid Soluble Cu (%)	0405	< 0.0002		0.0035	0.0047	0.0000	5		221.32	5
221	Acid Soluble Cu (%)	0593	< 0.01		0.0035	0.0047	0.0000	5		221.99	5
221	Acid Soluble Cu (%)	0586	< 2		0.0035	0.0047	0.0000	5		221.99	5
241	Acid Soluble Fe (%)	0494	0.8100	0.0400				2		241.33	0
241	Acid Soluble Fe (%)	0527	0.8556	0.0289				2		241.33	0
251	Acid Soluble Pb (ppm)	0096	4.450	0.7000	8.209	2.401	0.3952	5	-1.37	251.30	0
251	Acid Soluble Pb (ppm)	0494	7.485	0.6900	8.209	2.401	0.3952	5	-0.26	251.33	0
251	Acid Soluble Pb (ppm)	0042	8.674	0.2600	8.209	2.401	0.3952	5	0.17	251.99	0
251	Acid Soluble Pb (ppm)	0527	9.986	0.0259	8.209	2.401	0.3952	5	0.65	251.33	0
251	Acid Soluble Pb (ppm)	0593	10.45	0.3000	8.209	2.401	0.3952	5	0.81	251.30	0
251	Acid Soluble Pb (ppm)	0368	27.55	9.500	8.209	2.401	0.3952	5	7.03	251.34	1
251	Acid Soluble Pb (ppm)	0586	< 1.5		8.209	2.401	0.3952	5		251.30	5
251	Acid Soluble Pb (ppm)	0405	< 4		8.209	2.401	0.3952	5		251.32	5
261	Acid Soluble Mn (%)	0494	0.0151	0.0001				2		261.35	0
261	Acid Soluble Mn (%)	0527	0.0153	0.0001				2		261.35	0
281	Acid Soluble Hg (ppm)	0096	0.0047	0.0000	0.0302	0.0304	0.0008	3	-0.84	281.30	0
281	Acid Soluble Hg (ppm)	0368	0.0221	0.0009	0.0302	0.0304	0.0008	3	-0.27	281.99	0
281	Acid Soluble Hg (ppm)	0593	0.0639	0.0006	0.0302	0.0304	0.0008	3	1.11	281.30	0
281	Acid Soluble Hg (ppm)	0527	< 0.001		0.0302	0.0304	0.0008	3		281.30	5
281	Acid Soluble Hg (ppm)	0405	< 2		0.0302	0.0304	0.0008	3		281.30	5
289	Acid Soluble Mo (ppm)	0494	7.770	0.7000	9.118	1.457	0.5535	5	-0.81	289.33	0
289	Acid Soluble Mo (ppm)	0586	8.000	0.0000	9.118	1.457	0.5535	5	-0.67	289.30	0
289	Acid Soluble Mo (ppm)	0096	8.600	1.000	9.118	1.457	0.5535	5	-0.31	289.30	0
289	Acid Soluble Mo (ppm)	0527	10.02	0.1141	9.118	1.457	0.5535	5	0.54	289.33	0
289	Acid Soluble Mo (ppm)	0593	11.20	0.4000	9.118	1.457	0.5535	5	1.25	289.30	0
289	Acid Soluble Mo (ppm)	0368	< 0.1		9.118	1.457	0.5535	5		289.34	5
289	Acid Soluble Mo (ppm)	0405	< 1		9.118	1.457	0.5535	5		289.32	5
291	Acid Soluble Ni (ppm)	0405	4.500	1.000	12.31	7.557	0.5646	6	-0.92	291.32	0
291	Acid Soluble Ni (ppm)	0042	4.974	0.3450	12.31	7.557	0.5646	6	-0.86	291.99	0
291	Acid Soluble Ni (ppm)	0586	10.50	1.000	12.31	7.557	0.5646	6	-0.21	291.30	0
291	Acid Soluble Ni (ppm)	0593	16.75	0.1000	12.31	7.557	0.5646	6	0.52	291.30	0
291	Acid Soluble Ni (ppm)	0368	16.80	0.6000	12.31	7.557	0.5646	6	0.53	291.34	0
291	Acid Soluble Ni (ppm)	0527	20.32	0.3428	12.31	7.557	0.5646	6	0.94	291.33	0
291	Acid Soluble Ni (ppm)	0096	12.45	5.900	12.31	7.557	0.5646	6	0.02	291.30	1
301	Acid Soluble Se (ppm)	0593	2.900	0.0800				1		301.30	0
301	Acid Soluble Se (ppm)	0527	< 0.01					1		301.33	5
301	Acid Soluble Se (ppm)	0368	< 1.1					1		301.34	5
301	Acid Soluble Se (ppm)	0405	< 10					1		301.32	5

Analyte Group	Analyte (Units)	Lab Code	Lab Data		Method Values			# Tests	Magruder PT Z Score	Your Method	Flag
			Value	Range	Rob Mean	Rob SD	R-bar				
311	Sodium (%)	0494	0.5600	0.0200				2		311.33	0
311	Sodium (%)	0527	0.6003	0.0031				2		311.33	0
321	Acid Soluble Zn (%)	0405	0.0019	0.0001	0.0078	0.0075	0.0018	6	-0.70	321.32	0
321	Acid Soluble Zn (%)	0494	0.0035	0.0005	0.0078	0.0075	0.0018	6	-0.51	321.33	0
321	Acid Soluble Zn (%)	0040	0.0040	0.0000	0.0078	0.0075	0.0018	6	-0.45	321.00	0
321	Acid Soluble Zn (%)	0096	0.0060	0.0013	0.0078	0.0075	0.0018	6	-0.22	321.30	0
321	Acid Soluble Zn (%)	0368	0.0124	0.0039	0.0078	0.0075	0.0018	6	0.54	321.99	0
321	Acid Soluble Zn (%)	0042	0.0385	0.0030	0.0078	0.0075	0.0018	6	3.65	321.99	0
321	Acid Soluble Zn (%)	0586	26.50	1.000	0.0078	0.0075	0.0018	6	3145.03	321.99	1
321	Acid Soluble Zn (%)	0527	< 0.001		0.0078	0.0075	0.0018	6		321.33	5
321	Acid Soluble Zn (%)	0593	< 0.01		0.0078	0.0075	0.0018	6		321.33	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. 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.