Soil Science Society of America

2004 North American Proficiency Testing Program

4th Quarter Report January 14, 2005

Laboratory ID

Soil			Soil 2004-116			Soil 2004-117			Soil 2004-118			Soil 2004-119			Soil 2004-120		
Analysis	**Units**	***n***	**Median**	***MAD***	**Lab[1]**	**Median**	***MAD***	**Lab**	**Median**	***MAD***	**Lab**	**Median**	***MAD***	**Lab**	**Median**	***MAD***	**Lab**
Saturated Paste Analysis																	
Sat. Paste Moisture	%	31	39.8	4.5		45.0	3.4		28.3	1.7		38.4	2.0		40.3	2.3	
pH - sp	Unit	38	7.38	0.18		6.25	0.15		5.90	0.23		7.40	0.10		5.54	0.14	
ECe - sp	dS/m	43	1.22	0.12		0.92	0.12		0.40	0.07		2.05	0.15		0.55	0.05	
HCO_3 - sp	mmolc/L	12	4.80	0.74		2.93	0.89		1.13	0.20		3.96	1.56		0.6	0.3	
Ca - sp	mmolc/L	33	6.9	0.75		3.03	0.23		2.30	0.36		7.24	0.89		2.6	0.3	
Mg - sp	mmolc/L	33	3.40	0.39		1.42	0.18		0.7	0.12		2.83	0.36		1.1	0.12	
Na - sp	mmolc/L	34	1.2	0.26		0.98	0.23		0.71	0.20		1.45	0.22		0.4	0.2	
SAR - sp	value	26	0.55	0.13		0.62	0.13		0.62	0.22		0.65	0.11		0.25	0.13	
Cl - sp	mmolc/L	21	2.00	0.23		1.75	0.35		0.43	0.13		0.64	0.20		0.43	0.08	
SO_4 - sp	mmolc/L	16	1.5	0.36		2.35	0.44		1.65	0.25		1.30	0.28		0.6	0.2	
NO_3 - sp	mmolc/L	9	2.86	1.59		0.10	0.08		0.08	0.05		10.36	3.07		2.59	0.64	
B - sp	mg/L	18	0.10	0.029		0.25	0.04		0.04	0.016		0.14	0.021		0.10	0.020	
Soil EC																	
Soil EC (1:1)	(dS/m)	35	0.52	0.03		0.45	0.05		0.10	0.03		0.68	0.17		0.29	0.05	
Soil EC (1:2)	(dS/m)	48	0.33	0.04		0.28	0.04		0.09	0.014		0.48	0.06		0.15	0.02	
Soil pH																	
pH (1:1)	Unit	95	7.70	0.10		6.48	0.08		5.90	0.10		7.76	0.09		5.85	0.07	
pH (1:2)	Unit	33	7.85	0.10		6.60	0.10		6.00	0.10		8.06	0.16		5.92	0.12	
pH (1:1) 0.01M $CaCl_2$	Unit	22	7.26	0.11		5.94	0.05		5.32	0.07		7.29	0.07		5.30	0.10	
pH (1:2) 0.01M $CaCl_2$	Unit	17	7.38	0.06		5.93	0.07		5.30	0.06		7.39	0.06		5.28	0.06	
Buffer pH																	
SMP Buffer pH	Unit	51	7.42	0.06		6.92	0.08		7.10	0.05		7.50	0.03		6.74	0.06	
Adams-Evans Buf pH	Unit	14	7.81	0.03		7.68	0.08		7.78	0.07		7.90	0.06		7.54	0.06	
Woodruff Buf. pH	Unit	16	7.08	0.03		6.77	0.06		6.80	0.04		7.10	0.03		6.61	0.06	
Mehlich Buf. pH	Unit	4	6.74	0.015		6.21	0.05		6.33	0.010		6.74	0.02		6.05	0.04	
Titratable Acidity	cmol/kg	1	2.41	0.00		8.40	0.00		3.7	0.0		1.8	0.0		7.7	0.17	

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Analysis	**Units**	***n***	**Median**	***MAD***	**Lab[1]**	**Median**	***MAD***	**Lab**	**Median**	***MAD***	**Lab**	**Median**	***MAD***	**Lab**	**Median**	***MAD***	**Lab**
Nitrate (NO_3-N)																	
Cd. Rd.	mg/kg	60	34.8	3.2		23.5	2.7		4.9	0.7		77.1	5.75		20.5	1.7	
ISE	mg/kg	28	36.7	9.1		20.3	3.7		5.1	0.9		74.5	14.3		18.4	2.1	
CTA	mg/kg	8	36.9	2.4		30.8	2.5		5.7	0.4		84.1	6.5		23.5	1.9	
Ion Chromatography	mg/kg	2	32.3	1.8		24.3	1.8		3.7	0.7		78.3	5.8		14.9	2.9	
Other	mg/kg	9	37.1	5.9		28.5	1.5		5.7	1.7		81.4	15.0		23.1	2.3	
NH_4 - N (KCl Extr.)	mg/kg	54	49.3	4.3		28	3		5.6	0.8		1.3	0.7		19.0	2.2	
Amino-N (Mulvaney)	mg/kg	4	265	19		439	41		78	11		323	16		246	22	
Phosphorus & Sulfur																	
PO_4-P Bray P1 (1:10)	mg/kg	55	102	31		156	20		18.0	2.2		58.1	12.1		27.9	1.9	
PO_4-P Bray P1 (1:7)	mg/kg	11	90	12		141	21		14.0	4.0		51.0	6.5		22.0	4.0	
PO_4-P Olsen/Bicarb	mg/kg	64	76.3	6.6		90	12		9.0	2.1		90	9		13.0	1.7	
PO_4-P AB-DTPA	mg/kg	1	74.8			100			15.2			118			10.6		
PO_4-P M. Morgan	mg/kg	8	74.4	4.6		40.5	7.7		2.2	0.2		156	23		3.0	0.5	
PO_4-P M. Kewlona	mg/kg	3	130	14		136	6		11	1.0		170	5		20.0	1.0	
PO_4-P Strg Bray P-2	mg/kg	10	218	21.0		231	42.5		29	2.0		236	44		49.3	3.0	
PO_4-P Water Soluble	mg/kg	4	17.4	3.5		32.6	3.4		3.9	0.4		18.4	4.0		3.1	0.82	
SO_4 -S (PO_4 Extr.)	mg/kg	45	12.0	4.6		12.0	4.0		9.1	2.2		11.3	4.4		5.4	1.4	
Ammonium Ace. Bases																	
K	mg/kg	97	426	30		1241	194		82	8		1328	144		407	34.4	
Ca	mg/kg	92	4208	732		1912	221		500	55		3745	743		2144	153	
Mg	mg/kg	92	541	45		292	37.5		51	9		316	38		339	20	
Na	mg/kg	72	36	7.0		31	7.7		14	6.4		35	7.0		14.6	3.4	
K - Bray (1:10)	mg/kg	7	301	25		985	34		83	10.0		1029	73.0		306	16.0	
K- Bicarb.	mg/kg	9	316	14		1235	35		80	12		1305	85.0		336	18.0	
K - Modified Morgan	mg/kg	6	292	56		976	83		72	5		1082	48.5		343	60.8	
Ca Modified Morgan	mg/kg	3	19700	763		2290	726		461	57		12900	377.7		2300	363	
Al KCL Extr.	mg/kg	8	0.23	0.23		0.38	0.35		0.91	0.88		0.63	0.48		0.66	0.59	

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Mehlich-1 Multi Element																	
Soil Scoop Mass	g	9	5.00	0.10		5.00	1.21		5.00	0.11		5.00	0.73		5.00	0.20	
P	mg/kg	10	21.2	2.8		170	31.8		13.6	0.9		74.1	15.7		35.4	6.3	
K	mg/kg	10	174	14.5		815	97.5		63.0	6.0		775	83.4		228	14.6	
Ca	mg/kg	9	4930	502		1920	118		435	35		5070	1095		1470	129	
Mg	mg/kg	9	441	50		246	33		43.8	4.0		285	20		243	23.3	
Mn	mg/kg	9	2.9	0.5		105	3.7		64.9	10.10		1.9	0.8		48.6	4.2	
Zn	mg/kg	9	0.10	0.07		5.38	0.36		0.71	0.16		0.12	0.06		0.93	0.10	
Mehlich-3 Mult-Element																	
Soil Scoop Mass	g	28	1.94	0.29		1.50	0.39		2.28	0.17		1.72	0.31		1.83	0.32	
Scoop Volume	mL	16	1.10	0.10		1.06	0.12	x	1.18	0.09		1.06	0.12		1.09	0.09	
P Colorimetric	mg/kg	22	178	20		172	24		17.8	1.8		187	24		28.0	2.0	
P ICP	mg/kg	39	195	15		185	25		22.9	1.9		209	21		32.3	2.4	
K	mg/kg	49	440	40		1230	168		86.3	8.6		1360	134		425	35	
Ca	mg/kg	48	5580	468		1930	213		540	66		5490	423		2210	178	
Mg	mg/kg	48	643	45		293	30		60.5	7.5		427	38		350	18.1	
Na	mg/kg	32	40.0	5.9		32.2	5.4		17.3	4.2		38.0	6.2		18.0	5.8	
S	mg/kg	28	26.5	3.1		24.0	3.1		18.6	2.5		28.0	2.7		16.0	2.0	
Al	mg/kg	21	246	95		673	109		520	84		133	71		750	72	
Zn	mg/kg	39	9.3	1.0		7.2	1.1		0.98	0.16		10.4	0.97		1.45	0.20	
Mn	mg/kg	38	63	10.8		117	11.5		234	29		52.6	7.5		100	8.5	
Fe	mg/kg	35	87	11.1		227	46.2		112	16.6		98	16.0		127	18.0	
Cu	mg/kg	38	5.45	0.73		1.83	0.34		0.72	0.18		1.59	0.23		0.94	0.17	
B	mg/kg	35	1.29	0.17		1.02	0.20		0.27	0.10		1.81	0.29		0.63	0.13	

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Micronutrients																	
Zn - DTPA	mg/kg	75	**2.60**	*0.30*		**4.79**	*0.73*		**0.43**	*0.06*		**2.63**	*0.38*		**0.76**	*0.09*	
Mn - DTPA	mg/kg	63	**3.7**	*0.80*		**106**	*14.5*		**57.0**	*5.5*		**2.1**	*0.5*		**61.9**	*6.0*	
Fe - DTPA	mg/kg	66	**14.0**	*2.0*		**56.0**	*8.2*		**18.7**	*2.3*		**8.5**	*2.3*		**44.9**	*5.3*	
Cu - DTPA	mg/kg	64	**2.24**	*0.29*		**1.08**	*0.15*		**0.38**	*0.06*		**0.37**	*0.07*		**0.57**	*0.06*	
Zn - HCl	mg/kg	3	**3.08**	*2.28*		**6.8**	*0.35*		**0.91**	*0.01*		**10.4**	*0.86*		**1.36**	*0.14*	
Mn-H_3PO_4	mg/kg	12	**3.4**	*1.2*		**83.3**	*13.1*		**56.7**	*5.8*		**2.2**	*0.55*		**38.6**	*2.7*	
Cl - $Ca(NO_3)_2$ Extr.	mg/kg	22	**26.0**	*2.2*		**22.1**	*3.2*		**4.0**	*1.4*		**7.2**	*1.1*		**5.3**	*1.6*	
B - Hot Water	mg/kg	52	**0.72**	*0.18*		**1.06**	*0.27*		**0.20**	*0.08*		**0.98**	*0.27*		**0.57**	*0.19*	
B - DTPA-Sorb	mg/kg	12	**0.52**	*0.07*		**0.51**	*0.07*		**0.11**	*0.03*		**0.68**	*0.05*		**0.22**	*0.05*	
Soil Organic Matter																	
Soil Kjeldahl N	%	28	**0.180**	*0.014*		**0.307**	*0.022*		**0.051**	*0.004*		**0.267**	*0.018*		**0.170**	*0.013*	
Soil TN (combustion)	%	38	**0.180**	*0.010*		**0.310**	*0.019*		**0.050**	*0.006*		**0.280**	*0.019*		**0.170**	*0.010*	
Soil TOC (combustion)	%	30	**3.05**	*0.175*		**3.61**	*0.145*		**0.56**	*0.024*		**2.93**	*0.155*		**1.79**	*0.05*	
SOM - Walkley-Black	%	51	**3.00**	*0.30*		**5.79**	*0.79*		**1.10**	*0.12*		**3.86**	*0.36*		**3.00**	*0.24*	
SOM - LOI (Raw Values)	%	78	**3.40**	*0.20*		**6.40**	*0.40*		**1.20**	*0.10*		**4.45**	*0.39*		**3.60**	*0.23*	
$CaCO_3$ Content	%	18	**11.0**	*1.5*		**0.92**	*0.52*		**0.25**	*0.25*		**4.92**	*0.90*		**0.51**	*0.36*	
CEC - Displacement	cmol/kg	25	**18.2**	*1.6*		**21.5**	*2.2*		**4.7**	*1.00*		**17.3**	*2.4*		**19.4**	*2.12*	
- Estimation	cmol/kg	9	**29.0**	*5.9*		**18.1**	*3.1*		**4.1**	*1.1*		**27.8**	*6.8*		**18.1**	*1.2*	
Scoop Density	mg/cm^3	10	**1.16**	*0.145*		**0.91**	*0.066*		**1.36**	*0.056*		**1.08**	*0.120*		**1.13**	*0.146*	
Particle Size Analysis																	
Sand 2000 - 50 um	%	45	**26.6**	*4.2*		**19.9**	*4.1*		**35.0**	*3.0*		**55.8**	*3.8*		**18.0**	*4.0*	
Silt 50 - 2 um	%	45	**46.0**	*3.5*		**60.0**	*5.0*		**55.0**	*3.9*		**36.0**	*3.2*		**56.0**	*5.0*	
Clay 2 - 0 um	%	45	**27.5**	*2.5*		**18.8**	*3.3*		**10.0**	*2.0*		**8.2**	*2.2*		**26.0**	*2.7*	

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