Soil Science Society of America

2004 North American Proficiency Testing Program

3rd Quarter Report November 15, 2004

Laboratory ID

Soil			Soil 2004-111			Soil 2004-112			Soil 2004-113			Soil 2004-114			Soil 2004-115		
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	%	30	29.0	1.5		33.8	2.5		22.8	2.0		41.4	1.8		28.0	2.6	
pH - sp	Unit	38	7.80	0.10		5.67	0.14		5.10	0.10		5.50	0.10		7.21	0.09	
ECe - sp	dS/m	40	3.93	0.30		1.60	0.23		0.37	0.06		0.56	0.06		2.00	0.27	
HCO_3 - sp	mmolc/L	13	2.37	0.39		0.69	0.30		0.34	0.12		0.61	0.23		4.3	1.3	
Ca - sp	mmolc/L	32	29.3	2.26		8.89	1.25		1.01	0.28		2.74	0.38		18.1	3.4	
Mg - sp	mmolc/L	32	7.93	0.57		3.63	0.52		0.6	0.11		1.10	0.10		4.1	0.71	
Na - sp	mmolc/L	33	15.0	1.83		0.65	0.21		0.48	0.19		0.50	0.14		2.5	0.4	
SAR - sp	value	26	3.70	0.29		0.28	0.08		0.58	0.14		0.35	0.10		0.71	0.11	
Cl - sp	mmolc/L	20	3.68	0.85		0.69	0.10		0.35	0.09		0.49	0.11		1.75	0.34	
SO_4 - sp	mmolc/L	18	40.8	7.58		1.21	0.24		0.24	0.07		0.59	0.15		15.3	3.0	
NO_3 - sp	mmolc/L	10	1.50	0.46		5.5	4.0		1.93	0.72		2.71	1.43		1.55	1.12	
B - sp	mg/L	19	0.60	0.075		0.15	0.02		0.04	0.010		0.11	0.010		0.10	0.020	
Soil EC																	
Soil EC (1:1)	(dS/m)	40	1.79	0.56		0.47	0.13		0.10	0.04		0.28	0.05		0.57	0.12	
Soil EC (1:2)	(dS/m)	41	1.91	0.35		0.33	0.06		0.06	0.02		0.15	0.02		0.44	0.04	
Soil pH																	
pH (1:1)	Unit	95	7.90	0.10		5.91	0.19		5.38	0.13		5.76	0.07		7.40	0.10	
pH (1:2)	Unit	34	7.97	0.07		6.10	0.17		5.60	0.16		5.85	0.07		7.50	0.11	
pH (1:1) 0.01M $CaCl_2$	Unit	23	7.70	0.13		5.55	0.19		4.73	0.09		5.24	0.06		7.10	0.10	
pH (1:2) 0.01M $CaCl_2$	Unit	14	7.84	0.10		5.56	0.16		4.78	0.12		5.28	0.06		7.18	0.11	
Buffer pH																	
SMP Buffer pH	Unit	71	7.54	0.04		6.99	0.09		7.19	0.08		6.70	0.10		7.46	0.04	
Adams-Evans Buf pH	Unit	20	7.87	0.02		7.70	0.03		7.85	0.03		7.51	0.04		7.81	0.02	
Woodruff Buf. pH	Unit	21	7.13	0.03		6.76	0.04		6.80	0.05		6.62	0.05		7.06	0.04	
Mehlich Buf. pH	Unit	9	6.77	0.10		6.26	0.05		6.36	0.04		6.12	0.05		6.64	0.05	
Titratable Acidity	cmol/kg	4	0.08	0.00		0.04	4.80		1.7	0.8		7.6	0.5		1.1	0.12	

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Nitrate (NO_3-N)																	
Cd. Rd.	mg/kg	62	10.0	1.0		59.0	9.0		8.8	1.8		20.0	0.95		22.3	2.0	
ISE	mg/kg	22	11.9	2.9		47.9	11.4		8.9	2.5		17.0	1.2		20.0	3.4	
CTA	mg/kg	7	10.5	1.0		58.3	7.3		8.0	1.0		22.0	1.0		23.0	1.5	
Ion Chromatography	mg/kg	2	9.3	-		4.7	70.8		7.4	1.0		20.5	1.0		21.9	2.0	
Other	mg/kg	7	8.0	1.0		29.1	25.1		6.4	1.4		17.8	2.9		19.1	3.0	
NH_4 - N (KCl Extr.)	mg/kg	49	4.5	0.7		47	11		6.0	1.3		19.4	1.6		24.4	2.6	
Amino-N (Mulvaney)	mg/kg	2	52	8		52	11		81	56		168	69		191	61	
Phosphorus & Sulfur																	
PO_4-P Bray P1 (1:10)	mg/kg	53	11.0	5.0		25.2	2.7		89.0	11.0		27.0	2.0		75.0	9.0	
PO_4-P Bray P1 (1:7)	mg/kg	9	14.0	4.0		17.5	5.5		74.0	8.4		22.0	3.0		62.0	10.8	
PO_4-P Olsen/Bicarb	mg/kg	68	18.2	2.4		14.0	2.3		23.0	3.9		12.2	1.8		28.3	3.1	
PO_4-P AB-DTPA	mg/kg	2	16.5	5.3		16.5	8.4		33.1	13.3		7.0	4.3		26.1	6.7	
PO_4-P M. Morgan	mg/kg	7	43.0	3.8		3.2	0.5		5.1	0.3		2.9	0.2		98.4	15.7	
PO_4-P M. Kewlona	mg/kg	2	26.0	3.4		7.5	1.0		62	6.0		20.0	0.0		-	-	
PO_4-P Strg Bray P-2	mg/kg	13	167	33.0		45	6.0		90	17.5		49.5	4.5		293	73	
PO_4-P Water Soluble	mg/kg	2	2.5	2.2		1.3	2.4		6.2	2.1		3.6	2.2		17.0	2.30	
SO_4 -S (PO_4 Extr.)	mg/kg	44	208	119		11.6	4.5		3.3	1.7		6.0	2.0		65.0	14.0	
Ammonium Ace. Bases																	
K	mg/kg	93	367	31		242	28		25	7		407	30.5		428	33.4	
Ca	mg/kg	88	4395	702		1520	183		90	39		2080	160		2228	180	
Mg	mg/kg	89	278	30		235	31.0		14	6		332	26		208	21	
Na	mg/kg	69	214	25.0		16	5.3		11	4.6		16	5.2		44.0	6.6	
K - Bray (1:10)	mg/kg	4	338	9		198	15		33	7.0		318	23.0		371	1.5	
K- Bicarb.	mg/kg	10	306	21		218	16		22	3		331	13.5		297	18.0	
K - Modified Morgan	mg/kg	6	260	33		178	14		20	2		264	25.0		232	65.0	
Ca Modified Morgan	mg/kg	3	12257	2585		1835	144		81	20		2167	104.3		2341	206	
Al KCL Extr.	mg/kg	6	0.21	0.19		0.21	0.05		5.5	2.1		0.50	0.40		0.14	0.45	

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Mehlich-1 Multi Element																	
Soil Scoop Mass	g	13	5.00	0.00		5.00	0.00		5.00	0.00		5.00	0.00		5.00	0.00	
P	mg/kg	15	56.0	9.4		14.6	1.3		27.0	2.2		33.6	3.7		258.5	17.5	
K	mg/kg	15	202	22.0		148	13.1		19	3		243	14.4		279	17.6	
Ca	mg/kg	15	5080	547		1262	155		66	32		1553	169		2342	122	
Mg	mg/kg	15	293	40		192	25		14	5		246.0	24.5		214	29.0	
Mn	mg/kg	13	3.7	1.4		10.9	1.5		2.6	0.34		48.6	5.24		36.4	3.4	
Zn	mg/kg	12	0.03	0.05		1.08	0.16		0.47	0.09		0.81	0.08		3.33	0.27	
Mehlich-3 Mult-Element																	
Soil Scoop Mass	g	34	2.40	0.48		1.74	0.29		2.77	0.57		1.82	0.28		2.38	0.44	
Scoop Volume	mL	20	1.18	0.05		1.18	0.05		1.18	0.05		1.07	0.05		1.19	0.05	
P Colorimetric	mg/kg	23	51.2	2.8		26.6	2.5		84.5	10.5		26.5	1.5		143	22	
P ICP	mg/kg	41	54.0	5.7		30.8	5.1		107	10.8		31.6	3.6		159	15	
K	mg/kg	51	429	42		245	28.5		26.5	4.5		421.5	34.9		484	48	
Ca	mg/kg	49	7142	607		1610	150		105	38		2150	178		2857	261	
Mg	mg/kg	49	427	34		258	22		18.8	6.8		357	31		283	19.9	
Na	mg/kg	33	268	32		20.1	6.6		13.2	4.6		14.6	7.1		52.7	6.7	
S	mg/kg	27	1039	90		20.0	4.0		7.4	1.3		13.7	2.9		103	7.6	
Al	mg/kg	27	68	42		504	47		517	42		781	67		426	35	
Zn	mg/kg	42	2.33	0.42		1.61	0.29		1.08	0.22		1.45	0.31		4.69	0.55	
Mn	mg/kg	40	53	6.7		86	28.6		5.3	1.0		98.7	7.6		228	26.00	
Fe	mg/kg	39	89	9.4		300	36.0		114	15.8		132	14.6		68	8.9	
Cu	mg/kg	41	1.70	0.26		1.37	0.19		0.89	0.16		0.92	0.21		2.18	0.23	
B	mg/kg	37	3.41	0.48		0.67	0.24		0.20	0.11		0.65	0.13		1.11	0.14	

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Micronutrients																	
Zn - DTPA	mg/kg	70	**0.48**	*0.06*		**0.70**	*0.10*		**0.27**	*0.04*		**0.75**	*0.10*		**1.20**	*0.11*	
Mn - DTPA	mg/kg	58	**1.0**	*0.42*		**16.3**	*6.3*		**2.2**	*0.3*		**60.0**	*6.2*		**9.0**	*2.2*	
Fe - DTPA	mg/kg	63	**5.5**	*1.4*		**112**	*18*		**20.7**	*4.3*		**45.0**	*4.3*		**5.1**	*1.1*	
Cu - DTPA	mg/kg	61	**0.60**	*0.07*		**0.60**	*0.13*		**0.30**	*0.05*		**0.54**	*0.06*		**0.73**	*0.07*	
Zn - HCl	mg/kg	2	**2.18**	*0.62*		**1.3**	*0.24*		**0.55**	*0.06*		**1.2**	*0.39*		**4.24**	*0.67*	
Mn-H_3PO_4	mg/kg	10	**5.1**	*2.5*		**8.9**	*4.9*		**3.0**	*0.4*		**40.9**	*6.15*		**24.7**	*3.4*	
Cl - $Ca(NO_3)_2$ Extr.	mg/kg	18	**43.0**	*9.5*		**7.0**	*2.0*		**3.1**	*39.9*		**5.2**	*1.8*		**18.5**	*4.6*	
B - Hot Water	mg/kg	40	**1.54**	*0.36*		**0.58**	*0.18*		**0.10**	*0.06*		**0.58**	*0.18*		**0.60**	*0.20*	
B - DTPA-Sorb	mg/kg	13	**1.58**	*0.22*		**0.25**	*0.15*		**0.12**	*0.08*		**0.23**	*0.05*		**0.46**	*0.13*	
Soil Organic Matter																	
Soil Kjeldahl N	%	20	**0.072**	*0.006*		**0.139**	*0.009*		**0.020**	*0.003*		**0.170**	*0.010*		**0.095**	*0.006*	
Soil TN (combustion)	%	36	**0.073**	*0.013*		**0.140**	*0.010*		**0.020**	*0.006*		**0.169**	*0.011*		**0.094**	*0.006*	
Soil TOC (combustion)	%	28	**1.05**	*0.071*		**1.28**	*0.036*		**0.27**	*0.028*		**1.77**	*0.070*		**0.86**	*0.04*	
SOM - Walkley-Black	%	51	**1.35**	*0.15*		**2.04**	*0.19*		**0.53**	*0.11*		**2.90**	*0.26*		**1.60**	*0.16*	
SOM - LOI (Raw Values)	%	74	**1.50**	*0.15*		**2.74**	*0.17*		**0.53**	*0.07*		**3.62**	*0.22*		**1.84**	*0.16*	
CaCO3 Content	%	15	**3.31**	*0.19*		**0.30**	*0.15*		**0.09**	*0.11*		**0.45**	*0.25*		**0.38**	*0.30*	
CEC - Displacement	cmol/kg	24	**10.8**	*1.1*		**13.4**	*1.3*		**1.4**	*0.39*		**18.8**	*1.6*		**12.7**	*1.57*	
- Estimation	cmol/kg	9	**31.0**	*1.0*		**11.4**	*1.4*		**1.0**	*0.6*		**15.8**	*1.4*		**13.7**	*0.9*	
Scoop Density	mg/cm^3	12	**1.46**	*0.024*		**1.05**	*0.080*		**1.62**	*0.045*		**1.11**	*0.053*		**1.45**	*0.020*	
Particle Size Analysis																	
Sand 2000 - 50 um	%	41	**75.0**	*1.6*		**21.2**	*4.0*		**87.6**	*2.4*		**20.0**	*4.4*		**71.0**	*2.0*	
Silt 50 - 2 um	%	41	**9.4**	*1.8*		**57.7**	*6.1*		**7.5**	*1.6*		**55.0**	*5.3*		**18.2**	*2.3*	
Clay 2 - 0 um	%	41	**16.0**	*2.0*		**18.0**	*2.1*		**5.0**	*2.0*		**26.0**	*2.4*		**10.6**	*2.2*	

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