



October 2003 Round Robin Results – Saturated Paste Salinity Extracts

WEALA Round Robin Report for October 2003  
Soil Analysis - Salinity via Saturated Paste  
**SAMPLE RR-1**

Analytical Parameter	Units	Reference Method	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Mean	Stddev	CV(%)	95% Conf.		99% Conf.			
			1	2	3	4	5	6	7	8	9				10	-2xStd	+2xStd	-3xStd	+3xStd	
			WEALA RR-1	WEALA RR-1	WEALA RR-1	WEALA RR-1	WEALA RR-1	WEALA RR-1	WEALA RR-1	WEALA RR-1	WEALA RR-1				WEALA RR-1					
pH (sat. paste)		McKeague 4.13	7.25	7.3	7.4	7.5	7.5	7.3	7.89	7.3	7.4	7.4	0.1	1.2	7.2	7.6	7.1	7.6		
Conductivity (sat. paste)	mS/cm	McKeague 4.13	5.34	6.02	4.43	4.87	4.25	4.53	4.63	7.55	5.02	5.26	5.3	1.0	19.4	3.2	7.3	2.2	8.3	
Calcium	mg/L (ppm)	McKeague 3.21	220	292	227	223	242	233.0	200	383	256	267	240.0	27.8	11.6	184.3	295.7	156.5	323.5	
Magnesium	mg/L (ppm)	McKeague 3.21	122	122.0	85.1	87.0	105.0	131.0	77.8	164	123.0	112.0	112.9	25.7	22.8	61.5	164.3	35.8	190.0	
Potassium	mg/L (ppm)	McKeague 3.21	52	60	51	46.8	51.9	550	70.0	67.6	54.7	50	56.0	8.1	14.5	39.8	72.2	31.7	80.3	
Sodium	mg/L (ppm)	McKeague 3.21	747	1120	901	868	984	2560	903	1380	1010	1000	990.3	179.9	18.2	630.5	1350.2	450.6	1530.1	
Bicarbonate	mg/L (ppm)	McKeague 3.21			168	166	-		183			172	172.3	7.6	4.4	157.1	187.4	149.5	195.0	
Chloride	mg/L (ppm)	McKeague 3.21		57.2	54	45.8	56	25	44.0	57	38	50	47.4	10.7	22.6	26.0	68.9	15.3	79.6	
Nitrate	mg/L (ppm)	McKeague 3.21		0.76	0.664	0.79	0.6	< 13	0.14	< 13	<0.05	0.1	0.5	0.3	60.7	-0.1	1.1	-0.4	1.4	
Sulphate	mg/L (ppm)	McKeague 3.21		3430	912	2690	2720	1720	2627	4510	2440	2990	2671.0	1007.2	37.7	656.5	4685.5	-350.7	5692.7	
Calcium	meq/L	McKeague 3.21	11.0	14.57	11.4	11.1	12.1	11.63	9.97	19.11	12.78	13.3	13.0	2.6	19.8	7.9	18.1	5.3	20.7	
Magnesium	meq/L	McKeague 3.21	10.0	10.04	7.0	7.2	8.64	10.78	6.40	13.49	10.1	9.2	9.6	2.0	20.4	5.7	13.5	3.7	15.5	
Potassium	meq/L	McKeague 3.21	1.33	1.53	1.3	1.2	1.33	14.07	1.79	1.73	1.4	1.3	1.4	0.2	12.1	1.1	1.7	0.9	1.9	
Sodium	meq/L	McKeague 3.21	32.5	48.72	39.2	37.8	42.8	111.35	39.3	60.03	43.74	43.5	43.5	8.2	18.9	27.1	60.0	18.9	68.2	
Bicarbonate	meq/L	McKeague 3.21			2.76	2.7	-		3.0			2.8	2.8	0.0	1.4	2.7	2.8	2.6	2.9	
Chloride	meq/L	McKeague 3.21		1.61	1.54	1.3	1.58	0.71	1.24	1.61	1.07	1.4	1.4	0.3	23.8	0.7	2.0	0.4	2.3	
Nitrate	meq/L	McKeague 3.21		0.05	0.0475	0.1	0.04	< 0.9	0.01	< 0.9		<0.01	0.0	0.0	15.0	0.0	0.1	0.0	0.1	
Sulphate	meq/L	McKeague 3.21		71.41	57	56.0	56.6	35.81	54.7	93.90	50.82	62.2	60.5	16.9	27.9	26.8	94.2	9.9	111.0	
Sodium Adsorption Ratio		McKeague 3.26	10.0	13.9	12.9	12.5	13.3	10.5	13.7			12.9	13	12.4	1.4	11.1	9.6	15.1	8.3	16.5
Saturation	%	McKeague 3.21	72.6	55.6	84	75.0	72.5	86.0	79.4	62.5		73.0	74.2	72.8	9.4	12.9	54.0	91.6	44.6	101.1
TEXTURE: Sand	%		2	1.1	5.2	4	9	6	< 1			<1	2	4.2	2.8	66.6	-1.4	9.8	-4.2	12.5
Silt	%		55	75.3	61.8	56	58	67	60			61	69	62.9	7.1	11.2	48.8	77.1	41.7	84.1
Clay	%		43	23.6	33.0	40	33	27	40			38	29	33.3	6.7	20.2	19.8	46.8	13.1	53.5

383 = Outlier @ 1% critical value (Grubs Test) - Not included in Statistical analysis

WEALA Round Robin Report for October 2003  
Soil Analysis - Salinity via Saturated Paste

SAMPLE RR-1 - Statistical Outlier Data

Analytical Parameter	Calculated T value				T Values from Table n=10	
	Min	Max	T <sub>min</sub>	T <sub>max</sub>	5%	1%
pH (sat. paste)	7.3	7.5	1.3502	1.4115	2.18	2.41
Conductivity (sat. paste)	4.3	7.6	0.9852	2.2587		
Calcium	200.0	383.0	1.0385	2.4615		
Magnesium	77.8	164.0	1.3653	1.9886		
Potassium	46.8	550.0	0.3747	2.8426		
Sodium	747.0	2560.0	0.7631	2.6931		
Bicarbonate	166.0	183.0	0.8236	1.4166		
Chloride	25.0	57.2	2.0967	0.9113		
Nitrate	0.1	0.8	1.3232	0.9091		
Sulphate	912.0	4510.0	1.7464	1.8258		
Calcium	11.0	19.1	0.7861	2.3791		
Magnesium	7.0	13.5	1.3101	1.9798		
Potassium	1.2	14.1	0.3788	2.6648		
Sodium	32.5	111.4	0.7778	2.5245		
Bicarbonate	2.7	2.8	0.9977	1.0023		
Chloride	0.7	1.6	2.0070	0.8153		
Nitrate	0.0	0.1	1.2876	0.9266		
Sulphate	35.8	93.9	1.4631	1.9835		
Sodium Adsorption Ratio	10.0	13.9	1.7173	1.1032		
Saturation	55.6	86.0	1.8288	1.4000		
TEXTURE: Sand	1.1	9.0	1.1071	1.7273		
Silt	55.0	75.3	1.1221	1.7522		
Clay	23.6	43.0	1.4387	1.4424		

min, max values from before outliers removed

**383.0** = Outlier @ 5% critical value - Not included in Statistical analysis

$$\text{Calculated } T = |X_{\text{mean}} - X_i| / s$$

where  $X_i$  = suspect outlier,  $s$  = Standard Deviation

WEALA Round Robin Report for October 2003  
Soil Analysis - Salinity via Saturated Paste  
**SAMPLE SS#10**

Analytical Parameter	Units	Reference Method	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Lab I.D.	Mean	Stddev	CV(%)	95% Conf.		99% Conf.	
			1	2	3	4	5	6	7	8	9	10				-2xStd	+2xStd	-3xStd	+3xStd
			WEALA SS#10	WEALA SS#10	WEALA SS#10	WEALA SS#10	WEALA SS#10	WEALA SS#10	WEALA SS#10	WEALA SS#10	WEALA SS#10	WEALA SS#10							
pH (sat. paste)		McKeague 4.13	8.11	8.1	7.9	4.1	7.9	7.7	8.02	7.7	7.7	8	7.9	0.2	2.2	7.5	8.2	7.4	8.4
Conductivity (sat. paste)	mS/cm	McKeague 4.13	6.95	6.59	5.83	6.14	5.07	4.41	5.80	8.00	5.34	6.57	6.1	1.1	17.7	3.9	8.3	2.9	9.3
Calcium	mg/L (ppm)	McKeague 3.21	638	730	772	672	737	334.0	745	1110	557	668	696.3	193.6	27.8	309.0	1083.6	115.4	1277.2
Magnesium	mg/L (ppm)	McKeague 3.21	168	189.0	181.0	162.0	197.0	192.0	160.0	291	148.0	179.0	175.1	16.6	9.5	142.0	208.2	125.4	224.8
Potassium	mg/L (ppm)	McKeague 3.21	54	57	50	42.9	46.7	110	63.3	58.4	42.3	40	50.5	8.1	16.1	34.2	66.8	26.1	74.9
Sodium	mg/L (ppm)	McKeague 3.21	581	620	585	547	586	454.0	547	905	564	556	560.0	46.0	8.2	467.9	652.1	421.9	698.1
Bicarbonate	mg/L (ppm)	McKeague 3.21			189	164	-		207			172	183.0	19.1	10.4	144.8	221.2	125.7	240.3
Chloride	mg/L (ppm)	McKeague 3.21		1030	952	865	1030	379	769	1450	690	887	894.7	290.0	32.4	314.6	1474.7	24.6	1764.7
Nitrate	mg/L (ppm)	McKeague 3.21		50.0	41.2	37	20.7	81	30.9	< 13	<0.05	29.6	41.5	19.7	47.6	2.0	81.0	-17.8	100.7
Sulphate	mg/L (ppm)	McKeague 3.21		2050	800	2060	2180	1070	1936	3450	1690	1960	1910.7	748.0	39.1	414.7	3406.6	-333.3	4154.6
Calcium	meq/L	McKeague 3.21	31.8	36.43	38.6	33.5	36.8	16.67	37.2	55.39	27.8	33.3	34.5	10.2	29.6	14.1	54.9	3.8	65.1
Magnesium	meq/L	McKeague 3.21	13.8	15.55	14.9	13.3	16.2	15.79	13.2	23.94	12.2	14.7	14.6	1.4	9.3	11.8	17.3	10.5	18.6
Potassium	meq/L	McKeague 3.21	1.38	1.46	1.3	1.1	1.19	2.81	1.62	1.49	1.08	1	1.2	0.2	14.8	0.9	1.6	0.7	1.8
Sodium	meq/L	McKeague 3.21	25.3	26.97	25.4	23.8	25.5	19.75	23.8	39.37	24.54	24.2	24.4	2.1	8.7	20.2	28.7	18.1	30.8
Bicarbonate	meq/L	McKeague 3.21			3.1	2.7	-		3.4			2.8	2.9	0.2	7.4	2.4	3.3	2.2	3.5
Chloride	meq/L	McKeague 3.21		29.05	26.8	24.4	29.1	10.69	21.7	40.90	19.47	25	25.7	8.6	33.6	8.4	42.9	-0.2	51.6
Nitrate	meq/L	McKeague 3.21		3.57	2.94	2.6	1.48	5.79	2.21	< 0.9		2.1	3.1	1.5	48.7	0.1	6.1	-1.4	7.6
Sulphate	meq/L	McKeague 3.21		42.68	50	42.9	45.4	22.28	40.3	71.83	35.1	40.8	43.9	14.0	32.0	15.8	71.9	1.8	85.9
Sodium Adsorption Ratio		McKeague 3.26	5.3	5.3	4.9	4.9	5.0	1.55	4.75		5.5	4.9	5.1	0.2	4.8	4.6	5.6	4.4	5.8
Saturation	%	McKeague 3.21	45.8	40.1	43	41.0	43.2	63	46.3	38.7	45.6	47.9	43.2	3.2	7.3	36.8	49.5	33.7	52.6
TEXTURE: Sand	%		44	43.4	51.6	42	49	52	44		51	50	47.8	4.0	8.4	39.8	55.9	35.8	59.9
Silt	%		26	40.2	25.4	28	26	32	26		23	30	28.8	5.4	18.7	18.1	39.6	12.7	44.9
Clay	%		30	16.4	23.0	30	25	17	30		26	20	23.4	5.4	23.1	12.6	34.2	7.2	39.5

  = Outlier @ 1% critical value (Grubs Test) - Not included in Statistical analysis

WEALA Round Robin Report for October 2003

Soil Analysis - Salinity via Saturated Paste

SAMPLE SS#10 - Statistical Outlier Data

Analytical Parameter	If Calculated T > T from Table - Data point outlier				T Values from Table	
	Calculated T value				n=10	
	Min	Max	T <sub>min</sub>	T <sub>max</sub>	5%	1%
pH (sat. paste)	4.1	8.1	2.6447	0.5043	2.18	2.41
Conductivity (sat. paste)	4.4	8.0	1.5622	1.7563		
Calcium	334.0	1110.0	1.8709	2.1363		
Magnesium	148.0	291.0	0.9716	2.6184		
Potassium	40.0	110.0	0.8101	2.6350		
Sodium	454.0	905.0	1.1966	2.6445		
Bicarbonate	164.0	207.0	0.9950	1.2568		
Chloride	379.0	1450.0	1.7781	1.9149		
Nitrate	20.7	81.0	1.0526	2.0011		
Sulphate	800.0	3450.0	1.4849	2.0580		
Calcium	16.67	55.4	1.7445	2.0468		
Magnesium	12.2	23.94	1.0083	2.4697		
Potassium	1.00	2.81	0.7712	2.5304		
Sodium	19.75	39.37	1.1824	2.4765		
Bicarbonate	2.7	3.1	0.8203	1.1140		
Chloride	10.7	40.9	1.7366	1.7640		
Nitrate	1.5	5.8	1.0691	1.7959		
Sulphate	22.3	71.8	1.5399	1.9936		
Sodium Adsorption Ratio	1.55	5.5	2.4361	0.6505		
Saturation	38.7	63.0	0.9254	2.4352		
TEXTURE: Sand	42.0	51.6	1.4509	0.9403		
Silt	23.0	40.2	1.0806	2.1171		
Clay	16.4	30.0	1.2940	1.2290		

min, max values from before outliers removed

[Blue shaded cell] = Outlier @ 1% critical value - Not included in Statistical analysis

$$\text{Calculated } T = |X_{\text{mean}} - X_i| / s$$

where X<sub>i</sub> = suspect outlier, s = Standard Deviation