Project Name: **Re-inventing Australian Agricultural Landscape Systems**
Project Code: **RAALS** **Site ID:** **CP402** **Observation ID:** **1**
Agency Name: **CSIRO Land and Water (ACT)**

Site Information

Desc. By:	N.J. McKenzie	**Locality:**	Charles Sturt Uni., Lysimeter/IP Paddock 14
Date Desc.:	05/05/00	**Elevation:**	No Data
Map Ref.:	GPS S.A. Off	**Rainfall:**	No Data
Northing/Long.:	6120741 AMG zone: 55	**Runoff:**	Slow
Easting/Lat.:	530453 Datum: AGD66	**Drainage:**	Well drained

Geology

ExposureType:	Soil pit	**Conf. Sub. is Parent. Mat.:**	No Data
Geol. Ref.:	No Data	**Substrate Material:**	No Data

Land Form

Rel/Slope Class:	Undulating low hills 30-90m 3-10%	**Pattern Type:**	Low hills
Morph. Type:	Mid-slope	**Relief:**	60 metres
Elem. Type:	Hillslope	**Slope Category:**	Very gently sloped
Slope:	2 %	**Aspect:**	285 degrees

Surface Soil Condition (dry): Hardsetting

Erosion:

Soil Classification

Australian Soil Classification:
Mottled Mesotrophic Red Kandosol Medium Non-gravelly Clay-loamy Clayey Deep

Mapping Unit: N/A
Principal Profile Form: Dr3.12

ASC Confidence:
All necessary analytical data are available.

Great Soil Group: N/A

Site Disturbance: Cultivation. Rainfed

Vegetation:

Surface Coarse Fragments: No surface coarse fragments

Profile Morphology

A11p	0 - 0.07 m	Dark reddish brown (5YR3/4-Moist); , 0-0% ; Sandy clay loam, fine sandy; Weak grade of structure, 20-50 mm, Polyhedral; Earthy fabric; Moist; Weak consistence; Field pH 6 (Raupach); Many, very fine (0-1mm) roots; Clear, Smooth change to -
A12p	0.07 - 0.14 m	Dark reddish brown (5YR3/4-Moist); , 0-0% ; Sandy clay loam, fine sandy; Weak grade of structure, 20-50 mm, Polyhedral; Earthy fabric; Moist; Weak consistence; Field pH 4.5 (Raupach); Many, very fine (0-1mm) roots; Abrupt, Smooth change to -
B21	0.14 - 0.45 m	Red (10R4/6-Moist); , 0-0% ; Light clay; Massive grade of structure; Earthy fabric; Moderately moist; Firm consistence; Few cutans, <10% of ped faces or walls coated, faint; Field pH 6 (Raupach); Many, very fine (0-1mm) roots; Diffuse, Smooth change to -
B22	0.45 - 0.8 m	Red (10R4/6-Moist); Mottles, 7.5YR56, 20-50% , 15-30mm, Distinct; , 7.5YR31; Light medium clay; Weak grade of structure, 10-20 mm, Polyhedral; Rough-ped fabric; Moderately moist; Very firm consistence; Common cutans, 10-50% of ped faces or walls coated, distinct; Few cutans, <10% of ped faces or walls coated, distinct; Few (2 - 10 %), Ferromanganiferous, Coarse (6 - 20 mm), Laminae; Field pH 7 (Raupach); Common, very fine (0-1mm) roots; Diffuse, Smooth change to -
B23	0.8 - 1.05 m	Brown (10YR5/3-Moist); Mottles, 7.5YR44, 20-50% , 15-30mm, Distinct; , 7.5YR31; Medium clay; Weak grade of structure, 10-20 mm, Polyhedral; Moderate grade of structure, 5-10 mm, Polyhedral; Rough-ped fabric; Dry; Very firm consistence; Many cutans, >50% of ped faces or walls coated, distinct; Few cutans, <10% of ped faces or walls coated, distinct; Common (10 - 20 %), Ferromanganiferous, Coarse (6 - 20 mm), Laminae; Field pH 7 (Raupach); Common, very fine (0-1mm) roots; Gradual, Smooth change to -
B3	1.05 - 1.3 m	Light brownish grey (2.5Y6/2-Moist); Mottles, 10YR66, 20-50% , 15-30mm, Distinct; , 2.5YR54; Medium clay; Weak grade of structure, 10-20 mm, Polyhedral; Moderate grade of structure, 5-10 mm, Polyhedral; Rough-ped fabric; Dry; Very firm consistence; Many cutans, >50% of ped faces or walls coated, distinct; Few cutans, <10% of ped faces or walls coated, distinct; Common (10 - 20 %), Ferromanganiferous, Coarse (6 - 20 mm), Laminae; , Ferromanganiferous, Coarse (6 - 20 mm), Nodules; Field pH 7.5 (Raupach); Few, very fine (0-1mm) roots;

Morphological Notes

B22 4cm diameter macropore at 60cm. Yarabee morphology well expressed.

Observation Notes

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An excellent example of a 'Wagga Red Earth'. Again the structure description in the B is problematic. No pedality is evident (hence KA) in situ - Displacement reveals strong pedality. A very large horizontal macropore occurs at 60cm.

Site Notes

Stie is 20m north of the instantaneous profile site. Cover - Triticale stubble

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Laboratory Test Results:

Depth	pH	1:5 EC	Exchangeable Cations Ca	Mg	K	Na	Exchangeable Acidity	CEC	ECEC	ESP
m		dS/m				Cmol (+)/kg				%
0 - 0.07	4.9C	0.05A	5.46D	0.72	1.05	0.18		8.5L	7.4D	2.12
0.01 - 0.08	5.8A									
0.07 - 0.14	4.2C	0.04A	3.35D	0.56	0.58	0.17		7.2L	4.7D	2.36
0.14 - 0.45	5A									
0.2 - 0.4	5.7C	0.02A	5.06D	2.51	0.58	0.21		8.7L	8.4D	2.41
0.45 - 0.8	6.6A									
0.5 - 0.7	6.1C	0.02A	4.83D	4.36	0.44	0.33		10.4L	10D	3.17
0.8 - 1.05	7A									
0.85 - 1.05	5.9C	0.02A	4.5D	5.8	0.64	0.5		11.8L	11.4D	4.24
1.05 - 1.3	7.1A									
	6.9C	0.02A	7.2E	8.94	0.98	0.94		22B	18.1D	4.27
	8.4A									

Depth	CaCO3	Organic C	Avail. P	Total P	Total N	Total K	Bulk Density	Particle Size Analysis GV	CS	FS	Silt	Clay
m	%	%	mg/kg	%	%	%	Mg/m3			%		
0 - 0.07		1.46C			0.12D			0				
0.01 - 0.08							1.57					
							1.56					
							1.51					
							1.57					
							1.51					
0.07 - 0.14		0.83C			0.07D			0				
0.14 - 0.45		0.3C			0.04D			1				
0.2 - 0.4							1.43					
							1.46					
							1.54					
0.45 - 0.8		0.22C			0.04D			0				
0.5 - 0.7							1.60					
							1.60					
							1.60					
							1.57					
0.8 - 1.05		0.11C			0.03D			0				
0.85 - 1.05							1.68					
							1.77					
							1.76					
							1.66					
1.05 - 1.3	<0.1D	0.05C			0.02D			6				

Depth	COLE	Gravimetric/Volumetric Water Contents Sat.	0.05 Bar	0.1 Bar	0.5 Bar	1 Bar	5 Bar	15 Bar	K sat	K unsat
m		g/g - m3/m3							mm/h	mm/h
0 - 0.07										

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0.01 - 0.08	0.32F	0.29I	0.17E	0.15F	0.11F	14.9E	10.1C
	0.33F	0.29I	0.17E	0.14F	0.11F	14.9E	10.3C
	0.35F	0.31I	0.16E	0.14F	0.11F	38.8E	18.2C
	0.33F	0.29I	0.17E	0.15F	0.11F	18.9E	8.8C
	0.35F	0.31I	0.17E	0.14F	0.11F	34.9E	20.6C
0.07 - 0.14							
0.14 - 0.45							
0.2 - 0.4	0.32E	0.29E	0.22E	0.19F	0.17F	192D	73.9B
	0.31E	0.28E	0.22E	0.19F	0.17F	144D	44.7B
	0.32E	0.29E	0.23E	0.2F	0.18F	162D	82.7B
0.45 - 0.8							
0.5 - 0.7	0.34E	0.32E	0.27E	0.24F	0.23F	115D	11.3B
	0.32E	0.3E	0.25E	0.21F	0.2F	9.3D	20B
	0.34E	0.32E	0.26E	0.24F	0.23F	9.4D	20.2B
0.8 - 1.05							
0.85 - 1.05	0.31E	0.3E	0.28E	0.27F	0.25F	0.5D	1.4B
	0.32E	0.31E	0.28E	0.27F	0.25F	5.7D	45.6B
	0.32E	0.31E	0.28E	0.27F	0.25F	68D	16.2B
	0.33E	0.32E	0.29E	0.29F	0.27F	31D	10.4B
1.05 - 1.3							

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Laboratory Analyses Completed for this profile

15B2_CA	Exchangeable bases (Ca2+,Mg2+,Na+,K+) - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15B2_CEC	CEC - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15B2_K	Exchangeable bases and CEC - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15B2_MG	Exchangeable bases and CEC - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15B2_NA	Exchangeable bases and CEC - 1M ammonium chloride at pH 7.0, pretreatment for soluble salts
15C1_CA	Exchangeable bases (Ca2+,Mg2+,Na+,K+) - alcoholic 1M ammonium chloride at pH 8.5, pretreatment for soluble salts
15C1_CEC	CEC - alcoholic 1M ammonium chloride at pH 8.5, pretreatment for soluble salts
15C1_K	Exchangeable bases and CEC - alcoholic 1M ammonium chloride at pH 8.5, pretreatment for soluble salts
15C1_MG	Exchangeable bases and CEC - alcoholic 1M ammonium chloride at pH 8.5, pretreatment for soluble salts
15C1_NA	Exchangeable bases and CEC - alcoholic 1M ammonium chloride at pH 8.5, pretreatment for soluble salts
15J_BASES	Sum of Bases
19C1	Carbonates - Collins Calcimeter
2A1	Air-dry moisture content
3A1	EC of 1:5 soil/water extract
4A1	pH of 1:5 soil/water suspension
4B2	pH of 1:5 soil/0.01M calcium chloride extract - following Method 4A1
6B3	Total organic carbon - high frequency induction furnace, infrared
7A5	Total nitrogen - high frequency induction furnace, thermal conductivity
P10_GRAV	Gravel (%)
P10_S_0.48	0.48 micron (cumulative %) - Sedigraph
P10_S_1	1 micron (cumulative %) - Sedigraph
P10_S_1000	1000 micron (cumulative %) - Sedigraph
P10_S_125	125 micron (cumulative %) - Sedigraph
P10_S_15.6	15.6 micron (cumulative %) - Sedigraph
P10_S_2	2 micron (cumulative %) - Sedigraph
P10_S_20	20 micron (cumulative %) - Sedigraph
P10_S_2000	2000 micron (cumulative %) - Sedigraph
P10_S_250	250 micron (cumlative %) - Sedigraph
P10_S_3.9	3.9 micron (cumulative %) - Sedigraph
P10_S_31.2	31.2 micron (cumulative %) - Sedigraph
P10_S_500	500 micron (cumulative %) - Sedigraph
P10_S_53	53 micron (cumulative %) - Sedigraph
P10_S_63	63 micron (cumulative %) - Sedigraph
P10_S_7.8	7.8 micron (cumulative %) - Sedigraph
P3A1	Bulk density - g/cm3
P3B2VL_1	1 BAR Moisture m3/m3 - Volumetric using disturbed sample on pressure plate
P3B2VL_15	15 BAR Moisture m3/m3 - Volumetric using disturbed sample on pressure plate
P3B2VL_5	5 BAR Moisture m3/m3 - Volumetric using disturbed sample on pressure plate
P3B3VLb001	0.01 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb003	0.03 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb005	0.05 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb01	0.1 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb03	0.33 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)
P3B3VLb06	0.66 BAR Moisture m3/m3 - Volumetric using undisturbed 73mm diameter and 75mm height core on suction plate taken from center of large core (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)

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P3B3VLc001	0.01 BAR Moisture m3/m3 - Volumetric using undisturbed 98mm diameter core on suction plate
P3B3VLc003	0.03 BAR Moisture m3/m3 - Volumetric using undisturbed 98mm diameter core on suction plate
P3B3VLc005	0.05 BAR Moisture m3/m3 - Volumetric using undisturbed 98mm diameter core on suction plate
P3B3VLc01	0.1 BAR Moisture m3/m3 - Volumetric using undisturbed 98mm diameter core on suction plate
P3B3VLc03	0.3 BAR Moisture m3/m3 - Volumetric using undisturbed 98mm diameter core on suction plate
P3B3VLc06	0.6 BAR Moisture m3/m3 - Volumetric using undisturbed 98mm diameter core on suction plate
P4_100DMcK	Unsaturated Hydraulic Conductivity - 100mm potential - Using disk permeameter with method CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996
P4_10DMcK	Unsaturated Hydraulic Conductivity - 10mm potential - Using disk permeameter with method CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996
P4_30_LOV	Unsaturated Hydraulic Conductivity - 30mm potential Loveday falling head method using 98mm diameter cores
P4_50DMcK	Unsaturated Hydraulic Conductivity - 50mm potential - Using disk permeameter with method CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996
P4_sat_LOV	Saturated Hydraulic Conductivity - Modified (no de-aired water) Loveday falling head method using 98mm diameter cores
P4_sat_McK	Saturated Hydraulic Conductivity (CSIRO Div of Soil, DR 125, McKenzie and Jacquier, 1996)