Project Name: Soil Studies in the Lower Namoi Valley

Project Code: EDGEROI Site ID: na022 Observation ID: 1

Agency Name: **CSIRO Division of Soils (QLD)**

Site Information

Desc. By: D. McGarry Locality: University of Sydney, I.A.Watson Research Farm

Date Desc.: 24/02/88 Elevation: 226 metres Map Ref.: Sheet No.: 8837 S 1:50000 Rainfall: No Data Northing/Long.: 6647400 AMG zone: 55 Runoff: No Data 770610 Datum: AGD66 No Data Easting/Lat.: Drainage:

Geology

ExposureType: Conf. Sub. is Parent. Mat.: Undisturbed soil core No Data Geol. Ref.: **Substrate Material:** No Data No Data

Land Form

Rel/Slope Class: No Data Pattern Type: No Data Morph. Type: No Data Relief: No Data

Elem. Type: Very gently sloped Slope Category: Hillslope Aspect: 150 degrees Slope: 1 %

Surface Soil Condition (dry): Surface crust, Recently cultivated

Erosion:

Soil Classification

Australian Soil Classification: N/A Mapping Unit: Principal Profile Form: Dv4.13 ASC Confidence: **Great Soil Group:** Black earth

Confidence level not specified

Site Disturbance: Cultivation. Rainfed

Vegetation:

Surface Coarse Fragments:

Profile Morphology

Very dark grey (10YR3/1-Moist); Very dark grey (10YR3/1-Dry); , 10YR86, 0-2% , 0-5mm, A11p 0 - 0.08 m Distinct: Clay loam: Moderate grade of structure, 2-5 mm, Granular; Rough-ped fabric: Fine, (0 -5) mm crack; Common (1-5 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist;

Weak consistence; Field pH 7 (pH meter); Few, very fine (0-1mm) roots;

Very dark grey (10YR3/1-Moist); ; Clay loam; Massive grade of structure; Earthy fabric; Few A12p 0.08 - 0.2 m (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very firm consistence;

Field pH 7 (pH meter); Few, very fine (0-1mm) roots; Sharp, Smooth change to -

A13 0.2 - 0.37 m Very dark grey (10YR3/1-Moist); , N20, 0-2% , 5-15mm, Distinct; Clay loam; Moderate grade of

structure. 2-5 mm, Subangular blocky; Rough-ped fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Firm consistence; Field pH 8

(pH meter); Few, very fine (0-1mm) roots; Diffuse, Smooth change to -

Greyish brown (10YR5/2-Moist); , 10YR31, 2-10% , 5-15mm, Prominent; Medium clay; Weak B21 0.37 - 0.55 m

grade of structure, 5-10 mm, Subangular blocky; Earthy fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Firm consistence; Very

few (0 - 2 %), Calcareous, Fine (0 - 2 mm), Nodules; Field pH 8 (pH meter);

Greyish brown (10YR5/2-Moist); , 10YR31, 0-2% , 0-5mm, Distinct; Medium clay; Weak grade of **B22** 0.55 - 0.8 m

structure, 10-20 mm, Subangular blocky; Earthy fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very firm consistence; Few (2 - 10 %), Calcareous, Medium (2 -6 mm), Nodules; Field pH 8.5 (pH meter); Clear, Smooth change

to -

Greyish brown (10YR5/2-Moist); , 10YR31, 0-2% , 0-5mm, Distinct; Medium clay; Weak grade of **B23** 0.8 - 1.4 m

structure, 10-20 mm, Subangular blocky; Earthy fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very firm consistence; 2-10%, fine gravelly, 2-6mm, subangular, Consolidated rock (unidentified), coarse fragments; Common (10 - 20 %), Calcareous, Coarse (6 - 20 mm), Nodules; Field pH 8.5 (pH meter); Diffuse, Smooth

Greyish brown (10YR5/2-Moist); , 10YR31, 0-2% , 0-5mm, Distinct; Medium clay; Moderate С 1.4 - 2 m

grade of structure, 10-20 mm, Angular blocky; Rough-ped fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Strong consistence; 20-50%, coarse gravelly, 20-60mm, angular, Sandstone, coarse fragments; Common (10 - 20 %), Calcareous, Very coarse (20 - 60 mm), Nodules; Field pH 8.5 (pH meter); Sharp, Smooth

change to -

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D1 2 - 3.05 m Light grey (10YR7/1-Moist); , N20, 2-10% , 0-5mm, Distinct; Silty clay; Moderate grade of structure, 10-20 mm, Angular blocky; Smooth-ped fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm) macropores. Moderately moist: Very firm consistence:

100mm2) Very fine (0.075-1mm) macropores, Moderately moist; Very firm consistence; Common (10 - 20 %), Calcareous, Coarse (6 - 20 mm), Nodules; Field pH 8.5 (pH meter);

D2 3.05 - 3.8 m Light grey (10YR7/1-Moist); ; Silty clay; Moderate grade of structure, 10-20 mm, Angular blocky; Smooth-ped fabric; Fine, (0 - 5) mm crack; Few (<1 per 100mm2) Very fine (0.075-1mm)

macropores, Moderately moist; Very firm consistence; Many (20 - 50 %), Calcareous, Coarse

(6 - 20 mm), Veins; Field pH 8.5 (pH meter);

D3 3.8 - 4.1 m Light grey (10YR7/1-Moist); , N20, 2-10% , 0-5mm, Distinct; Silty clay; Strong grade of structure,

5-10 mm, Angular blocky; Smooth-ped fabric; Fine, (0 - 5) mm crack; Moderately moist; Strong consistence; Many (20 - 50 %), Calcareous, Very coarse (20 - 60 mm), Veins; Field pH 8.5 (pH

meter);

Morphological Notes

A11p The second colour in na02201 is sand grains, perhaps washed downslope. Na02202 is

a weak to moderate plough pan. The organic material in na02203 is a burnt (carbon) tree

root. Na02204 is 50:50 A and B, but is described as if B dominant. Na0

A12p 2207 has abundant angular sandstone pieces - so is termed C, and sampled. Core

sample from 312 to 373cm was not found, so a sample was taken at 400-410cm. (The comment is mute on this point but it seems that the missing part of the core was

later found and sampled, see profile). Na02208 has moderately pedal clay in broad

vertical bands, associated with carbonate in pockets and bands. Na02209 is 50:50

carbonate band (vertical) and grey clay. The top of the profile is possibly

B21 colluvium from sandy beds at higher levels. Carbonate-rich Rolling Downs marl extends

from 30-200cm. It includes angular red (2.5YR5/6) sandstone and rounded quartz

fragments from 140-160cm, resting sharply on light grey (N7/) soapy siltsto

B22 nes, with a prominent thick vein of white (10YR8/1) carbonate to 429cm. The soil is

poorly described as a black earth; more appropriately, no suitable group.

Observation Notes

Parent Rock: residual, clay, marl Rolling Downs Group

Site Notes

A13

On a higher level than na017, with chalk and ferruginized stones scattered on the surface. A weak sandy clay crust covers the surface.

Soil Studies in the Lower Namoi Valley

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Laboratory Test Results:

Depth	рН	1:5 EC			ole Cations		Exchangeable	CEC	ECEC	ESP
m		dS/m	Ca	Mg	K	Na Cmol (Acidity +)/kg			%
0 - 0.02	6.68A	0.076A	10.42B	5.24	1.05	<0.01				
0 - 0.08	7.37A	0.185A	12.55B	4.4	0.98999 99	0.84				
0.1 - 0.2	7.82A	0.211A	13.7B	3.98	0.87	0.9				
0.2 - 0.3	8.37A	0.16A	23.44B	4.89	0.81000 01	0.83				
0.3 - 0.4	8.53A	0.142A	20.94B	4.77	0.59	0.85				
0.7 - 0.8	8.8A	0.14A	16.42B	9.92	0.15	0.78				
1.2 - 1.3	8.94A	0.157A		14.89	0.31	0.62				
1.45 - 1.55	8.83A	0.163A		14.89	0.39	0.7				
2.5 - 2.6	9.08A		12.14B	25.42	0.17	2.8				
3.5 - 3.6	8.96A	-	10.13B	21.66	0.05	3.68				
4 - 4.1	9.18A	0.143A	3.22B	10.28	<0.01	2.06				
Depth	CaCO3	Organic	Avail.	Tota	al Total	Tota	al Bulk	Portiolo	Ci-o	Analysis
Берш	CaCOS	C	Avaii. P	P	ai iotai N	K		GV CS	FS	Silt Clay
m	%	%	mg/kg	%		%			%	J,
0 000	0.45	4.540								40.0.00.0
0 - 0.02 0 - 0.08	<0.1B <0.1B	1.54C 1.28C	12.7J							12.9 23.9 12.6 23.7
0 - 0.08	<0.1B 0.2B	2.31C	12.7J 13.7J							12.0 23.7
0.1 - 0.2	5.1B	2.83C	2.8J							9.3 25.8
0.3 - 0.4	5.9B	1.65C	1.5J							9.8 28.5
0.7 - 0.8	2.6B	0.31C	<1J							10.6 31.2
1.2 - 1.3	17.6B	0.13C	<1J							8.4 27.8
1.45 - 1.55	12.2B	0.16C	<1J							8.1 29.4
2.5 - 2.6	7.2B	0.23C	<1J							18.7 43.8
3.5 - 3.6	21.4B	0.05C	<1J							21.1 39.9
4 - 4.1	77.6B	0.04C	<1J							7.8 17.1
Depth	COLE		Grav	/imetric/	Volumetric \	Nater Co	ntents	K	sat	K unsat
		Sat.	0.05 Bar	0.1 Ba		1 Bar	5 Bar 15	Bar	- /1-	
m					g/g - m3/m	3		mn	n/h	mm/h
0 0 02										

^{0 - 0.02}

^{0 - 0.08} 0.1 - 0.2

^{0.1 - 0.2} 0.2 - 0.3 0.3 - 0.4 0.7 - 0.8 1.2 - 1.3 1.45 - 1.55 2.5 - 2.6 3.5 - 3.6 4 - 4.1

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Laboratory Analyses Completed for this profile

15A2_CA Exchangeable bases (Ca2+,Mg2+,Na+,K+) - 1M ammonium chloride at pH 7.0, pretreatment for

soluble salts

15A2_K Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts 15A2_MG Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts 15A2_NA Exchangeable bases- 1M ammonium chloride at pH 7.0, pretreatment for soluble salts

19B1 Carbonates - manometric 3A1 EC of 1:5 soil/water extract 4A1 pH of 1:5 soil/water suspension

5A2 Chloride - 1:5 soil/water extract, automated colour

6B3 Total organic carbon - high frequency induction furnace, infrared

7B1 Water soluble nitrate - automated colour

9B1 Bicarbonate-extractable phosphorus - manual colour

P10_CF_C Clay (%) - Coventry and Fett pipette method Silt (%) - Coventry and Fett pipette method