

Appendix III - Site and Soil Descriptions and Analytical Data for Representative Profiles

Kalkee Clay – Soil 1 (Kc-1)

Profile No. 9A210: Parish of Kewell West; Allotment No. 74

Topography: Position: mid slope in a gently undulating plain; slope: gentle.

Land use: wheat; *phase:* fallow.

Condition of surface soil: self mulching, seasonal cracking.

Surface soil

0 to 15cm yellowish grey (5Y5/1 d, 5Y4/1 m) light clay; moderate coarse sub-angular blocky structure; smooth faced peds; soft dry, friable moist, plastic and slightly sticky wet; trace of hard calcium carbonate; sharply separated from:

Subsoil

15 to 35 cm diffusely mottled yellowish grey (5Y5/1 d, 5Y4/1 m) and yellowish grey brown medium clay; moderate medium to coarse angular and sub-angular blocky structure; smooth faced peds; hard dry, slightly friable moist, plastic and slightly sticky wet; trace of soft calcium carbonate; clearly defined from:

35 to 60 cm slightly mottled yellowish grey (5Y5/1 d and m), pale yellow-grey (10YR7/2 d and m), dull yellow-brown and yellowish brown heavy clay; weak medium to coarse crumb and sub-angular blocky structure; smooth faced peds; light amount of soft calcium carbonate; grades into:

60 to 85 cm diffusely mottled dull yellow-brown (10YR7/3 d and m), brownish yellow-grey (5Y5/1 d and m), brownish yellow-grey and some brown heavy clay; moderate fine to medium sub-angular blocky structure; smooth faced peds; soft dry, friable moist, plastic and sticky wet; light amount of soft calcium carbonate; grades into:

85 to 105 cm diffusely mottled pale brownish yellow-grey (5Y7/2 d and m), dark yellowish grey and some brown heavy clay; weak medium to coarse angular and sub-angular blocky structure; smooth faced peds; hard dry, friable moist, plastic and sticky wet; slight amount of soft calcium carbonate; grades into:

105 to 125 cm diffusely mottled brownish yellow-grey (5Y7/2 d and m), dark yellowish grey (5Y5/1 d and m), yellowish brown, some brown and some greyish brown heavy clay; weak fine to medium angular blocky structure; smooth faced peds; hard dry, friable moist, plastic and sticky wet; slight amount of soft and hard calcium carbonate; grades into:

125 to 140 cm as for above with an increase in the amount of the soft calcium carbonate and an absence of hard calcium carbonate; grades into:

140 to 160 cm diffusely mottled slightly brownish yellow-grey (5Y6/2 d and m), some brown and some dark yellowish grey heavy clay; weak fine to medium angular blocky structure; smooth faced peds, hard dry, friable moist, plastic and sticky wet; slight amount of soft calcium carbonate, grades into:

160 to 195 cm as for above with yellowish brown replacing brown; slight amount of soft and hard calcium carbonate; grades:

195 to 210 cm as for above with the addition of brown in the mottle; trace amount of soft and hard calcium carbonate

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-15	8.3	0.017	190
15-35	8.8	0.011	220
35-60	9.1	0.011	360
60-85	8.9	0.014	430
85-105	9.5	0.023	570
105-125	9.2	0.117	1120
125-140	9.0	0.222	1600
140-160	8.9	0.275	1950
160-195	8.7	0.290	2070
195-210	8.7	0.291	2090

Kalkee Clay – Soil 2 (Kc – 2)

Profile No. C210; Parish of Kewell West; Allotment No 52

Topography: Position: mid slope in a very gently undulating plain; slope: level.

Land use: wheat; *phase:* fallow.

Condition of surface soil: self mulching, seasonal cracking.

Surface soil

0 to 15 cm brownish grey (10YR5/3 d, 10YR3/3 m) light clay; moderate coarse sub-angular blocky structure; smooth faced peds; soft dry, very friable moist, plastic and slightly sticky wet; trace of hard calcium carbonate; sharply separated from:

Subsoil

15 to 110 cm moderately mottled grey-brown (10YR5/3 d and m) and dull brown (10YR5/4 d and m) light to medium clay; moderate medium sub-angular blocky structure; smooth faced peds; slightly hard dry, friable moist, plastic and slightly sticky wet; slight soft and hard calcium carbonate; grades into:

110 to 150 cm moderately mottled pale yellow-grey (10YR6/3 d and m) and brown heavy clay; moderate coarse angular and sub-angular blocky structure; smooth faced peds; hard dry, slightly friable moist, plastic and sticky wet; trace of soft calcium carbonate; grades into:

150 to 210 cm slightly mottled pale yellow-grey (10YR6/3 d and m) and pale brown heavy clay; moderate coarse sub-angular blocky structure; smooth faced peds; hard dry, slightly friable moist, plastic and sticky wet; slight amounts of soft calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-15	8.4	0.007	190
15-110	9.3	0.033	500
110-150	9.5	0.118	1200
150-210	9.5	0.127	1200

Kalkee Clay – Soil 3 (Kc-3)

Profile No: A210; Parish of Kalkee; Allotment No 28.

Topography: Position: mid slope in a very gently undulating plain; *slope:* level.

Land use: wheat; *phase:* fallow.

Condition of surface soil: self mulching, seasonal cracking.

Surface soil

0 to 13 cm grey brown (10YR5/3 d, 10YR3/3m) light clay; strong coarse sub-angular blocky structure; smooth faced peds; moderately hard dry, slightly friable moist, plastic and sticky wet; trace of hard calcium carbonate; sharply separated from:

Subsoil

13 to 25 cm moderately mottled grey-brown (10YR4/3 d, 10YR3/3 m) and reddish brown light clay; strong coarse sub-angular blocky structure; smooth faced peds; hard dry, slightly friable moist, plastic and sticky wet; trace of soft and hard calcium carbonate; grades into:

25 to 90 cm slightly mottled brown (7.5YR 5/6 d and m) and grey-brown medium clay; strong coarse angular and sub-angular blocky structure; smooth faced peds; slightly hard dry, friable moist, plastic and sticky wet; trace of soft and hard calcium carbonate clearly separated from:

90 to 138 cm slightly mottled brown (7.5YR6/5 d and m) and pale yellow-brown heavy clay; moderate coarse sub-angular blocky structure; smooth faced peds; hard dry, slightly friable moist, plastic and sticky wet; trace of hard calcium carbonate; clearly separated from:

138 to 210 cm diffusely mottled slightly brownish yellow-grey (10YR6/3 d and m) and yellowish grey heavy clay; moderate coarse angular and sub-angular blocky structure; smooth faced peds; hard dry, non-friable moist, plastic and sticky wet; trace of hard calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-13	8.2	0.010	220
13-25	8.8	0.010	140
25-90	8.5	0.049	1630
90-138	9.0	0.135	1690
138-210	8.9	0.240	2000

Kalkee Clay – Soil 4 (Kc-4) (Two Sites) -Site A (In Kc-gp Mapping Unit on the Soil Map)

Profile: Mnf; Parish of Kewell West; Allotment No. 74.

Topography: Position: upper slope in a gently undulating plain; *slope:* gentle.

Land use: wheat; *phase:* fallow.

Condition of surface soil: self mulching, seasonal cracking.

Surface soil

0 to 10 cm grey-brown (10YR4/2 m) light to very light clay; moderate coarse sub-angular blocky structure; smooth faced peds; slightly hard dry, friable moist, plastic and slightly sticky wet; trace of hard calcium carbonate; sharply separated from:

Subsoil

10 to 25 cm dark grey (5Y3/1 m) light clay; strong medium and coarse angular blocky structure; smooth faced peds; hard dry, non-friable moist, plastic and sticky wet; trace of soft calcium carbonate; grades into:

25 to 50 cm dark brownish grey (5Y4/1 m) heavy clay; moderate medium and coarse sub-angular blocky structure, units breaking down to small angular blocky, smooth faced peds, hard dry, slightly friable moist, plastic and sticky wet. Trace of soft calcium carbonate; sharply separated from:

50 to 90 cm slightly mottled greyish yellow-brown (10YR7/3 m) and some dark grey (5Y3/1 m) medium heavy clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; moderately hard dry, moderately friable moist, plastic and sticky wet; light amounts of soft and hard calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity ($\mu\text{S}/\text{cm}$)
0-10	8.6	0.009	170
10-25	8.8	0.005	160
25-50	9.2	0.004	270
50-90	9.7	0.022	590
90-120	9.6	0.082	940

Site B (in com 111 mapping unit on the soil map).

Profile No: B210; Parish of Kalkee; Allotment No 13.

Topography: Position: lower slope in a gently undulating plain; slope; level.

Land use: wheat; *phase:* fallow.

Condition of surface soil: self-mulching, seasonal cracking.

Surface soil

0 to 10 cm grey (10YR5/2, 10YR4/2 m) very light clay; weak medium crumb and sub-angular blocky structure; smooth faced peds; soft dry, friable moist, plastic and slightly sticky wet; trace of hard calcium carbonate; sharply separated from:

Subsoil

10 to 30 cm diffusely mottled grey (1-YR5/1 d and m) and some yellowish grey light clay; strong coarse prismatic structure; smooth faced peds; very hard dry, slightly friable moist, plastic and sticky wet; trace of hard and soft calcium carbonate; grades into:

30 to 65 cm diffusely mottled grey (10YR6/2 d and m) and yellowish grey medium clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; slightly hard dry, slightly friable moist, plastic and sticky wet; trace of hard soft calcium carbonate; grades into:

65 to 120 cm slightly mottled grey (10YR6/2 d and m) and pale yellowish grey light to medium clay; moderate medium sub-angular blocky structure; smooth faced peds; hard dry, slightly friable moist, plastic and sticky wet; trace of gypsum and soft calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-10	8.6	0.009	160
10-30	9.0	0.017	290
30-65	9.5	0.028	600
65-120	9.2	0.095	1310
120-210	8.4	0.183	3750

Kalkee Clay – Soil 5 (Kc-5)

Profile No: G210; Parish of Dimboola; Allotment No. 78.

Topography: Position: mid slope in a very gently undulating plain; slope; level.

Land use: wheat; *phase:* stubble.

Condition of surface soil: self mulching, seasonal cracking.

Surface soil

0 to 10 cm brownish grey (2.5Y5/2 d, 2.5Y4/2 m) light clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; hard dry, moderately friable moist, plastic and slightly sticky wet; trace of hard calcium carbonate; sharply separated from:

10 to 20 cm sporadically bleached and slightly mottled pale brown (7.5YR7/4 d and m), dull brown (7.5YR5/4 d and m) and brownish grey (2.5Y4/2 d, 2.5Y4/3 m) light clay; unaggregated massive structure; hard dry, slightly friable moist, non-plastic and slightly sticky wet; slight amount of hard calcium carbonate; sharply separated from:

Subsoil

20 to 60 cm slightly mottled pale yellowish grey-brown (10YR6/3 d, 10YR6/4 m), grey brown 10YR4/2 d, 10YR3/2 m) and some pale brown light clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; slightly hard dry, moderately friable moist, plastic and sticky wet; slight amounts of soft and hard calcium carbonate; changes very gradually into:

60 to 85 cm slightly mottled pale yellow-grey (10YR7/3 d, 10YR7/4 m), grey (2.5Y5/2 d, 2.5Y4/2 m) and some brown medium to heavy clay; weak coarse sub-angular blocky structure; smooth faced peds; moderately hard dry, slightly friable moist, plastic and sticky wet; trace of soft calcium carbonate; grades into:

85 to 150 cm brownish yellow-grey (10YR6/3 d and m) heavy clay; moderate medium and coarse angular and sub-angular blocky structure; smooth faced peds; hard dry, non-friable moist, plastic and sticky wet; trace of soft calcium carbonate; grades into:

150 to 210 cm diffusely mottled pale brown (7.5YR6/4 d and m), brown and some reddish brown heavy clay; moderate medium and coarse angular and sub-angular blocky structure; smooth faced peds; hard dry, non-friable moist, plastic and sticky wet; no visible evidence of calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-10	8.6	0.008	190
10-20	9.0	0.010	200
20-60	9.6	0.020	380
60-85	9.8	0.048	620
85-150	9.7	0.090	1030
150-210	9.5	0.144	1200

Murra Warra Clay – Soil (M^wc-1)

Profile No: 8B210; Parish of Wail; Allotment No 8.

Topography: Position: upper slope in a very gently undulating plain; slope; gentle.

Land use: wheat; *phase:* stubble.

Condition of surface soil: self-mulching, seasonal cracking.

Surface soil

0 to 18 cm grey brown (10YR5/3 d, 10YR4/3 m) very light clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; slightly hard dry, friable moist, plastic and slightly sticky wet; sharply separated from;

Subsoil

18 to 35 cm dark slightly reddish greyish brown (7.5YR4/3 d, 7.5YR4/4 m) light clay, sub-plastic, to heavy clay; strong medium and coarse angular blocky structure; smooth faced peds; moderately hard dry, moderately friable moist, plastic and sticky wet; clearly separated from:

35 to 60 cm pale greyish yellowish brown (10YR6/3 d, 10YR6/4 m) medium clay; moderate fine and medium sub-angular blocky structure; smooth faced peds; moderately hard dry, moderately friable moist, plastic and sticky wet; slight amount of soft calcium carbonate; grades into:

60 to 120 cm very pale greyish brown (10YR7/3 d, 10YR6/4 m) light clay; weak medium and coarse sub-angular blocky structure; smooth faced peds; moderately hard dry, moderately friable moist, plastic and sticky wet; moderate amount of soft calcium carbonate; grades into:

120 to 210 cm slightly mottled brownish yellow-grey (10YR6/3 d and m) and brown (10YR5/6 d and m) heavy clay; moderate medium and coarse angular and sub-angular blocky structure; smooth faced peds; extremely hard dry, non-friable moist, plastic and very sticky wet.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-18	7.8	0.007	200
18-35	8.5	0.021	340
35-60	8.9	0.078	730
60-120	9.1	0.160	1320
120-210	9.1	0.209	1600

Murra Warra Clay- Soil 2 (M^wc-2)

Profile No: 3B210; Parish of Dimboola; allotment No 81.

Topography: Position: upper slope in an undulating plain; slope; moderate.

Land use: wheat; *phase:* stubble.

Condition of surface soil: self mulching, seasonal cracking.

Surface soil

0 to 10 cm grey-brown (10YR4/2 d, 10YR3/3 m) light clay with some fine sand; moderate coarse crumb and sub-angular blocky structure; smooth faced peds; slightly hard dry, moderately friable moist, plastic and slightly sticky wet; sharply separated from:

Subsoil

10 to 40 cm reddish brown (5YR4/4 d, 5YR4/6 m) heavy clay; strong medium and coarse angular blocky structure; smooth faced peds, hard dry slightly friable moist, plastic and sticky wet; grades into:

40 to 60 cm diffusely mottled brown (10YR5/4 d, 10YR5/6 m) and reddish brown (7.5YR5/6 d, 7.5YR5/8 m) medium clay; weak medium and coarse sub-angular blocky structure; smooth faced peds; very hard dry, slightly friable moist, plastic and sticky wet; slight amount of soft calcium carbonate; grades into:

60 to 90 cm as for above but diffusely mottled brown (10YR5/4 d, 10YR5/6 m) and yellowish brown (10YR6/4 d, 10YR6/6 m); with increase in the soft calcium carbonate to light amount; grades into:

90 to 120 cm as for above but diffusely mottled yellow-brown (10YR6/4 d and m) and greyish yellow-brown (10YR6/3 d, 10YR6/4); extremely hard dry, non-friable moist, plastic and very sticky wet; with decrease in the soft calcium carbonate to slight amount; grades into:

120 to 210 cm as for above but slightly mottled pale yellow-grey (10YR7/3 d and m), some brownish yellow (10YR6/8 d and m) and some dark brown (10YR4/3 d and m) with light amount of soft and hard calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-10	8.0	0.005	210
10-40	8.9	0.016	330
40-60	9.3	0.032	620
60-90	9.4	0.083	990
90-120	9.4	0.144	1310
120-210	9.3	0.156	1370

Murra Warra Sandy Loam (M^wsl)

Profile No: 356; Parish of Dimboola; Allotment No. 31A.

Topography: Position: upper slope in an undulating plain; slope; moderate.

Land use: wheat; *phase:* fallow.

Condition of surface soil: hard-setting.

Surface soil

0 to 18 cm greyish brown sandy loam; unaggregated massive; hard dry, slightly friable moist, non-plastic and slightly sticky wet; sharply separated from:

Subsoil

18 to 45 cm diffusely mottled greyish red-brown and grey-brown heavy clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; very hard dry, slightly friable moist, plastic and sticky wet; sharply separated from:

45 to 70 cm greyish reddish brown medium clay; strong medium and coarse angular blocky structure; smooth faced peds; very hard dry, moderately friable moist, plastic and sticky wet; trace amount of hard and soft calcium carbonate; grades into:

70 to 120 cm yellow-brown medium clay; weak coarse sub-angular blocky structure; smooth faced peds; hard dry, moderately friable moist, plastic and sticky wet; trace amounts of hard and soft calcium carbonate.

No analytical data available.

Murra Warra Sandy Clay Loam (M^s scl)

Profile No: 546; *Parish of* Kalkee; *allotment No.* 44.

Topography: Position: mid slope in a very gently undulating plain; slope; very gentle.

Land use: wheat; *phase:* fallow.

Condition of surface soil: hard-setting.

Surface soil

0 to 10 cm greyish brown sandy clay loam, unaggregated massive; hard dry, slightly friable moist, slightly plastic and slightly sticky wet; sharply separated from:

Subsoil

10 to 30 cm dull red-brown medium to heavy clay; strong medium and coarse sub-angular blocky structure; smooth faced peds; hard dry, moderately friable moist, plastic and sticky wet; grades into:

30 to 45 cm as for above but brown heavy clay; grades into:

45 to 65 cm as for above but dull yellowish brown medium clay; trace amounts of soft calcium carbonate; grades into:

65 to 120 cm as for above but moderately mottled dull yellow-brown, brownish yellowish grey and yellowish grey; slight amount of soft calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
10-40	9.2	0.020	Not available
60-90	8.7	0.206	Not available

Minor Soil Type 1 (MT-1)

Profile No: 528; Parish of Dimboola; Allotment No. 43.

Topography: Position: mid slope in a gently undulating plain; slope; very gentle.

Land use: wheat; *phase:* pasture.

Condition of surface soil: seasonal cracking.

Surface soil

0 to 5 cm grey-brown (10YR4/2 d, 10YR3/2 m) sandy light clay; unaggregated massive structure; very hard dry, non-friable moist, plastic and slightly sticky wet; sharply separated from:

Subsoil

5 to 30 cm dark brownish grey (5Y3/2 d and m) heavy clay; moderate very coarse prismatic structure, units breaking down to strong medium and coarse angular blocky smooth faced peds; hard dry, non-friable moist, plastic and sticky wet; sharply separated from:

30 to 60 cm diffusely mottled yellowish grey (2.5Y5/2 d and m) and grey-brown heavy clay; moderate coarse sub-angular blocky structure; smooth faced peds; slightly hard dry, moderately friable moist, plastic and sticky wet; trace amount of soft calcium carbonate; grades into:

60 to 95 cm diffusely mottled yellowish grey-brown (10YR5/3 d and m) and grey heavy clay; weak medium sub-angular blocky structure; smooth faced peds; slightly hard dry moderately friable moist, plastic and sticky wet; slight amount of soft calcium carbonate; grades into:

95 to 120 cm diffusely mottled dull yellowish brown (10YR5/3 d and m) and some pale grey heavy clay' weak medium sub-angular blocky structure; smooth faced peds; slightly hard dry, moderately friable moist, plastic and sticky wet; slight amount of soft calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
0-5	7.3	0.007	110
5-30	8.6	0.022	440
30-60	9.0	0.096	890
60-95	8.9	0.146	1320
95-120	8.7	0.178	1530

Minor Soil Type 2 (MT-2)

Profile No: 517; Parish of Dimboola; Allotment No 33.

Topography: Position: upper slope in a gently undulating plain; slope; moderate.

Land use: wheat; *phase:* pasture.

Condition of surface soil: seasonal cracking.

Surface soil

0 to 13 cm grey-brown medium clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; very hard dry, non-friable moist, plastic and sticky wet; sharply separated from:

Subsoil

13 to 38 cm red-brown heavy clay; strong medium and coarse angular blocky structure; smooth faced peds; very hard dry, slightly friable moist, plastic and sticky wet; grades into:

38 to 48 cm as above but reddish brown; grades into:

48 to 65 cm brown heavy clay; moderate medium sub-angular blocky structure; smooth faced peds, hard dry, moderately friable moist, plastic and sticky wet; trace amount of soft calcium carbonate; grades into:

65 to 100 cm slightly mottled pale yellow-brown and brown medium to heavy clay; weak fine and moderate sub-angular blocky structure; smooth faced peds; hard dry, moderately friable moist, plastic and sticky wet; slight amount of soft calcium carbonate; grades into:

100 to 120 cm as above but pale brownish yellow-grey medium clay.

No analytical data available.

Minor Soil Type 3 (MT-3)

Profile No: 560; *Parish of* Wail; *Allotment No* 16.

Topography: Position: upper slope in a very gently undulating plain; slope; gentle.

Land use: wheat; *phase:* pasture.

Condition of surface soil: self-mulching, seasonal cracking.

Surface soil

0 to 8 cm greyish brown light to medium clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; slightly hard dry, friable moist, plastic and sticky wet; sharply separated from:

8 to 18 cm pale dull yellow-brown sandy loam; unaggregated massive; hard dry, moderately friable moist, non-plastic and non-sticky wet; sharply separated from:

Subsoil

18 to 35 cm red-brown medium to heavy clay; moderate medium and coarse sub-angular blocky structure; smooth faced peds; moderately hard dry, moderately friable moist, plastic and sticky wet; grades into :

35 to 68 cm as for above but reddish brown heavy clay; trace amount of soft calcium carbonate; grades into:

68 to 85 cm s for above but slightly yellowish brown medium to heavy clay; slight amount of soft calcium carbonate; grades into:

85 to 120 cm as for above but moderately mottled yellowish brown and yellowish grey; moderate amount of soft calcium carbonate.

Analytical Data

Depth (cm)	pH	Chloride %	Electrical Conductivity (µS/cm)
18-48	8.2	0.081	Not available
60-90	8.9	0.214	Not available