

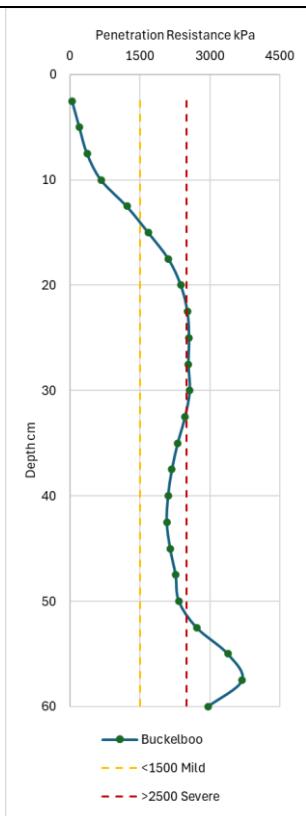
Summary data – Buckleboo Pit

	Depth cm	pH _{Ca}	Avg PR	MinN mg/kg	MinN kg/ha	ColP mg/kg	PBI	DGT P (ug/L)	Col K mg/kg	S mg/kg	B mg/kg	Clay %	OC %	CEC cmol ⁺ /kg	Ex Mg %	Ex Na %
	0-10 ¹	5.40	-	15.1	22.7	84	44	483	290	12	0.18	3.2	0.49	2.53	15.0	1.2
	0-14	6.22	700	2.5	5.3	10	16	42	82	<2.5	0.16	4.0	0.24	2.2	15.7	0.3
	14-24	5.16	2389	2.9	4.4	15	15	163	44	9.6	0.12	4.9	0.34	1.98	15.2	0.5
	24-40	4.98	2360	4.3	10.3	45	25	309	57	11	0.13	3.9	0.48	1.81	13.7	0.7
	40-70	7.16	2694	3.7	16.7	<5.0	25	<4	71	3.1	0.24	4.3	0.25	3.21	13.7	0.4
	70-90	7.70	-	4.3	12.9	<5.0	26	5	64	4.3	0.57	6.0	0.24	5.25	18.6	0.5
	90-105	7.68	-	3.4	7.7	<5.0	29	<4	59	3.5	0.56	5.8	0.22	3.53	31.2	0.9
	105-115	7.32	-	4.5	6.8	<5.0	39	<4	100	4.1	0.72	10.6	0.14	6.78	39.8	4.1

- Repellence – severe >3cm when assessed in paddock (MED = 0)
- pH extremes – a band of moderate acidity in the 14-24 cm layer, becoming more severe in the 24-40 cm zone before becoming alkaline below (see image below right).
- Organic Carbon is very low in the A1 horizon.

¹ 0-10 cm sample was a composite of on- and off-row samples collected around the pit. Horizon samples were collected as a composite from in the pit (mixed and subsampled).

- Nutrients – low phosphorus in the 0-14cm sample, but >35 mg/kg in a 0-10cm sample, sufficient potassium and sulphur, luxury zinc (1.8).
- Nutrients – 64 kg mineral nitrogen present through the profile, sufficient to meet the needs of 1.5 t/ha wheat crop, however 44kg of this was detected below 40cm, where few crop roots were found, corresponding with elevated penetration resistance.
- Nutrients – Deficient in boron and copper (0.17 mg/kg).
- Subsoil hostilities – clay content increases below 90cm, with an excess of magnesium and sodium; peds were dispersive (see photo at right). The soil was saturated above this horizon boundary, suggesting water perches above the dispersive clay.
- Soil strength – there was obvious ‘plough pan’ seen in the pit in the 14-24 cm layer that had few roots present. Abundant roots were seen both above and below this layer (see image below left). Penetration resistance exceeds 2500 kPa at 22 cm and remains severe to 35cm.



Water repellence and pH were measured for 5cm layer depths. Results show stratified acidity in the 15-20cm band. Not repellent via MED, but visually non-uniform wetting. Video shows not repellent at the surface, mildly repellent 1-2cm and severely repellent >3cm.

Take home message for the repellence video

1cm – not repellent (<5 seconds)
 2cm – mildly repellence (>5 seconds)
 >3cm – severe repellence in the zone of seed placement (>4 minutes); germination may be hindered due to non-uniform wetting through the soil.

	Control	
	MED	pH
0-5 cm	0	6.79
5-10 cm	0	5.48
10-15 cm	0	5.89
15-20 cm	0	5.07
20-25 cm	0	6.34
25-30 cm	0	6.05

N.B. Solution: Chisel plough with a Bednar or deep ripping with inclusion plates may provide an effective solution to providing some nutrition and carbon in the subsoil to encourage root growth and alleviate acid stratification; lime application may also be beneficial. Fertilise annually to correct constraints.

