

## The response of pastures to deep tillage and superphosphate in NE Victoria

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The surface horizons of many pasture soils in NE Victoria show signs of compaction. Root penetration in these soils is poor and is often restricted to the first 20-30 mm of the soil. Deep tillage is a term used to describe the mechanical loosening of compacted surface horizons of pasture soils while leaving the surface of the soil relatively undisturbed. This paper reports the results of two deep tillage experiments conducted at Wodonga on soils which showed signs of severe root restriction in sub. clover - volunteer annual grass pastures.

### Method

The treatments at both sites were +/- deep tillage to 150 mm (Oct 81, Wallace Soil Reconditioning Unit. - site A, Sept 82 Agrowplow. - site 8), and +/- 250 kg superphosphate/ha/yr. Basal treatments were 150 g sodium molybdate/ha (June 82) and 125kg muriate of potash/ha/yr.

### Results and Discussion

There was no interaction at either site between deep tillage and superphosphate.

The herbage dry matter yields at each harvest, in the climatically favourable season of 1983, are given for site A in Table 1 and for site B in Table 2.

**Table 1 - Herbage yields (kg DM/ha), site A**

Main effects of treatments	Harvest date			Total
	June 14	Oct 5	Nov 26	
Untilled	1150	2350	2730	6230
Deep tilled	1190	3370 **	2340	6900
No super	810	2140	2330	5280
Super	1550 **	4180 **	2560	8290 **

**Table 2 - Herbage yields (kg DM/ha), site B**

Main effects of treatments	Harvest date		Total
	June 2	Nov 4	
Untilled	1490	4830	6320
Deep tilled	1980	6100 *	8080 *
No super	1780	5060	6840
Super	1890 **	5870 **	7760 **

\* P < 0.05; \*\* P < 0.01

There was a significant response to deep tillage and superphosphate at both sites. The response to deep tillage at site A was evident only during the wetter part of the year (June-October). The soil at this site has poor internal drainage and I suspected that deep tillage has improved the drainage/aeration characteristics of the soil.

At site B, the response to deep tillage (while statistically significant yield increases were not obtained at the first harvest) was visible throughout the year. It is suspected that the response at this site was due in part to greater access to moisture through increased rooting depth.

The results suggest that worthwhile pasture responses can be obtained by the modification of compaction zones occurring in permanent pastures.