

The effect of crop tillage on pasture regeneration and production on a hard setting red brown earth

J.D. Warren

Western Australian Department of Agriculture, Katanning, WA, 6317

Pasture performance is generally recognised as being poor following the associated cropping. One aspect of cropping that contributes to reduced pasture performance is the effect of tillage which can bury pasture seeds below a depth from which seedlings are able to emerge, (1 and 2). This paper reports the effects of crop tillage treatments on pasture establishment and spring dry matter production.

Methods

Tillage treatments applied since 1977 in a 1:1 wheat:pasture rotation are: DDC5, direct drill combine with 5cm points (N.B. before 1987 Triple Disc Drill); DDC, direct drill combine 10cm points; CCS, cultivated with scarifier (18cm points) 5cm deep and combine sown; DP, district practise of work-up with scarifier (18cm points) to a depth of 11cm and worked back with a combine (5cm deep), combine sown. Regeneration counts made on 13.6.88 consisted of 40 x 0.05m quadrats per plot, which were replicated 3 times. Two pasture cages per plot were placed on 13.6.88 and sampled (0.25m² quadrat) on the 20.9.88 and medic component (*Medicago truncatula*) separated.

Results and discussion

Increasing the level of tillage disturbance decreased medic and grass regeneration but did not affect broadleaf pasture species (Table 1). Therefore it can be postulated that increased tillage disturbance created an environment which was less conducive to pasture establishment either through depth of seed burial or enhancement of the soil's hardsetting character.

Table 1. Regeneration and production of pasture in the year following four crop tillage treatments.

Tillage	Regeneration (plants/m ²)			Dry matter production (kg/ha)	
	Medic	Grass	Broadleaf	Total	Medic
DDC5	305	1223	53	3397	1118
DDC	290	333	44	4410	2431
CCS	185	250	38	4766	2603
DP	158	198	61	4746	1626
LSD (<0.05)	115	368	N.S.	1096	862

The poor overall pasture production from DDC5 appears to be a consequence of competition between medic and the high density grass component. The poor medic performance under DP may be due to reduced initial medic density. However medic production under CCS was significantly higher despite a similar initial medic density. This suggests some other factor may be involved possibly a carry over of increased nitrogen fertility often associated with soil cultivation favouring grass production.

1. Taylor, G.B. (1985) Aust. J. Exp. Agric. 25, 568-573.

2. Carter, D.E. and Challis, S. (1987) Proc. 4th Aust. Agron. Conf., Melbourne pp. 192.