Comparison of three methods of' establishing perennial grasses

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Comparison of methods of tillage and no tillage was led to the development and widespread implementation of new methods of establishing crops. Similar comparisons have not been made of methods of pasture establishment on the central tablelands.

Thus this experiment compared the efficiency of conventional cultivation, direct-drilling and surface-sowing in the establishment and development of perennial grasses on the central tablelands of New South Wales.

Methods

Seed of Phalaris aquatica cv. Sirosa and Dactylis glomerata cv. Currie was sown by the three methods, into a resident sward of annual grasses, annual legumes, broadleafed weeds and one year old oat stubble on soil derived from granite at Carcoar. The conventional method consisted of four cultivations in the two weeks prior to sowing, two with a scarifier and two with stump-jump harrows. Seedbed preparation for direct-drilling and surface-sowing consisted of + herbicide application on August 26, 1981 (Table 1). On the conventional and direct-drilled treatments seed was sown one cm deep through a band seeder positioned to follow the tines of a Connor Shea drill; mesh harrows trailed. For the surface-sowing treatment, seed was dropped from the seeding tubes of the drill into the undisturbed soil surface. Four replications of each treatment were sown on September 14, 1981 and measurements of establishment and development of sown species made a c. five monthly intervals thereafter. Rainfall recorded at a nearby weather station was, 1981 (sowing-Dec 31) - 272mm; 1982-260mm; 1983-819mm.

Results and Discussion

Results recorded on February 8, 1984 indicated the necessity to apply herbicides to enable perennial grasses to establish and develop from direct-drilling or surface-sowing into a pasture dominated by Lolium rigidum (Table 1). The relative efficiency of the herbicides appeared to influence results; glyphosate being less efficient that 2,2-DPA/amitrole because of wet conditions at spraying. Conventional cultivation gave equivalent weed control at sowing to the best herbicide and thus comparable establishment and development of sown grasses. The late sowing time would have placed the surface sowing treatment at a relative disadvantage to conventional and direct drilling treatments especially in relation to rainfall received between sowing and the first summer.

Table 1. Effect of method of establishment on the development of perennial grasses 29 months after sowing.

		% ground cover		
Method	Herbicide	P. aquatica	D. glomerata	Total
Conventional	nil	31	10	41
Direct-drill	2,2-DPA/amitrole	41	14	55
	Paraquat/diquat/dicamba	32	13	45
	glyphosate	28	8	36
	nil	8	1	9
Surface-sown	2,2-DPA/amitrole	29	12	41
	Paraquat/diquat/dicamba	24	8	32
	glyphosate	17	4	21
	nil	5	1	6

Similar results were obtained on another site where the same treatments were imposed on a degraded 15 year old Lolium perenne pasture. Further measurements are being taken to record pasture development over time.