

COMPARISON OF SPRING SOWN *BRASSICA* SPP. IN DIRECT DRILLED AND CULTIVATED SEEDBEDS

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Abstract

An experiment was undertaken in south western Victoria in 1989 to compare the effects of direct drilling and conventional tillage on the seedling establishment and dry matter yields of six *Brassica* crops. There was no difference in establishment of seedlings between the sowing methods, however the prepared seedbed method gave 66% greater dry matter yields 90 days after sowing.

Direct drilling (DD) of perennial ryegrass and subterranean clover using inverted T sowing points (1) is now an accepted method of pasture establishment in autumn in southwestern Victoria (6). However, the suitability of this method of sowing has not been assessed for spring sown *Brassica* crops which traditionally have been sown into a prepared seedbed (PS).

The use of spring sown brassicas, and especially turnips, is important in south western Victoria for finishing lambs in summer (3). The use of DD for spring sown brassicas should enable the crop to be sown earlier than using conventional cultivation as no seed bed preparation is required. Early sowing in October by DD should also better utilise soil moisture and help the plants establish before soil moisture deficits develop in summer. However, Braim *et al* (2) found that the topsoil was more compacted after DD compared with the PS treatment, and Raszkha (5) showed that deep tillage had a beneficial effect on root crops compared with DD.

The aim of this experiment was to examine the effects of two contrasting spring sowing methods on seedling establishment and subsequent production of brassicas.

Materials and methods

Six brassica summer fodder crop species, two hybrids (Simax and Pasja), one each of rape (Rangi) and kale (Kestrel) and two turnips (Mammoth Purple Top and Barkant) were sown into a typical hard setting clay loam at PVI, Hamilton, into soil found in much of south western Victoria classified by Northcote (4) as hard setting loamy soils with brown or mottled brown clayey subsoil.

The area was hard grazed throughout the winter of 1989 and sprayed with 2 l/ha of glyphosate at the end of September 1989 to promote a bare, weed-free area. The PS treatment was ploughed and power harrowed. The experiment was sown on 17th October 1989. Rape, kale and the two hybrids were sown at 4 kg/ha of seed and turnips at 1 kg/ha. The seed was mixed with double superphosphate (17% P, 4% S) immediately before sowing. Seedlings were counted four weeks after sowing. The 20 m plots were divided into two sections. On one side herbage was harvested twice on 15 January and 13 March 1990, and on the other side accumulated growth was harvested once only on 13 March. For both dates the area harvested was 9 m x 0.5 m using a rotary mower set to cut 25 mm above ground level. Turnips were harvested once only by pulling up whole plants and weighing bulbs and foliage. The 12 treatments (6 species x 2 methods of establishment) were allocated at random within each of 3 blocks. Treatment effects were assessed by analysis of variance.

Results and Discussion

There was no difference in seedling density between the methods of establishment (Table 1). All brassica species sown into a PS produced more dry matter than those DD at the first harvest on 15th January 1990 and on accumulated growth harvested on 13 March. For crops other than turnips, the mean yield for

two harvests (2.33 DM t/ha) taken on 15 January and regrowth on 13 March did not differ from the mean yield for one harvest only taken on 13 March (2.31 DM t/ha).

Table 1 Effect of DD versus PS and time of harvest on seedling density and yield on two harvest dates and accumulated total yield for one harvest only.

	?	?	15 November 1989 Seedling density (plants/m ²)	15 January 1990 Harvest 1 (DM t/ha)	13 March 1990 Total yield (DM t/ha)	
	?	?	?	?	2 harvests	1 harvest only
Treatment	?	Averaged over both methods of establishment)			DD	PS
Turnip x Chinese? cabbage (Simax)			66	1.85	2.48	2.02 2.57
Rape x turnip (Pasja)			81	1.52	2.17	1.33 2.16
Kale (Kestrel)			62	1.64	2.11	2.27 3.41
Rape (Rangi)			61	1.81	2.56	2.06 2.69
Turnip (MPT)			11	2.48	NG ^a	3.24 2.98
(Barkant)			28	3.10	NG	2.79 5.28
LSD (<i>P</i> =0.05)			17	0.59	?	1.03 ^b
PS (Averaged over crop type)			52 ^c	2.58	2.84	3.18
DD(Averaged over crop type)			51	1.55	1.80	2.29
LSD (<i>P</i> =0.01)			?	0.46	0.36	0.57

a NG, No growth due to complete plant being harvested at harvest 1.

b This LSD also applies to differences within rows.

c Difference not significant (*P*=0.78).

The results from this experiment show the advantages of a prepared seedbed in obtaining the best yields when sowing a spring sown brassica summer fodder crop.

The reason why there should be differences between the two systems of sowing has not been studied here. For the hard setting soils of south western Victoria, DD may lead to poorer root growth so that crops are less able to cope with moisture stress in summer.

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