

Reduced tillage vegetable production systems for coastal New South Wales

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New cultural practices that rely less on tillage have been developed for broadacre crops. In vegetable production the need for new practices is greater than in other crops because of the high frequency of cropping and the aggressive methods of cultivation used. The opportunity for change may also be greater because the high value of crops means that a range of management options can be considered when high cost might otherwise be a barrier to adoption. However, the adoption of conservative cultural practices in vegetable production has been slow, although the use of plastic mulch, which reduces cultivation, has been adopted to increase soil temperature and promote early production. Our work aimed to demonstrate a range of alternative reduced tillage practices to coastal vegetable growers. Secondary aims were to identify any real problems and record sufficient data to enable an economic comparison of treatments. Production data for the first four crops are presented here.

Methods

Four cultural methods were compared under a common regime of trickle irrigation, nutrition and pest and disease control. The methods were i) conventional tillage in which cultivation (rotary hoe) was the primary method of weed control, ii) plastic mulch, iii) permeable weed matting, and iv) minimum tillage in which herbicides were used exclusively to control weeds once the beds were formed. The crop sequence and sowing dates was

- cucumbers (12/10/84),
- tomatoes (22/2/85)
- lettuce (17/9/85)
- tomatoes (8/1/86),
- broccoli (18/6/86)
- Rockmelons (27/10/86).

Plots were raised beds, 3 m long, at 2 m centres.

Results and discussion

Data for yield and product quality reveal no disadvantage in deleting cultivation for the production of these vegetables, once beds have been formed. Any of the three uncultivated treatments gave equal or better yields than the cultivated, and the quality of produce was sometimes better and never worse. Plastic mulch, and, to a lesser extent, weed matting, gave earlier maturity and, with lettuce, more even maturity. It appears that the profitability of the alternative systems will depend on their costs and on other advantages which may become apparent when each system is managed optimally. For example, earlier maturity with mulching may enable more frequent cropping. We observed no consistent pest, disease or nutritional disorders due to cultural practice. The minimum tillage treatment showed slow early growth, which was not evident in the mulched (uncultivated) treatments, but this did not reduce yields.

	Cultivated	Plastic Mulch	Weed Matting	Minimum Tillage	l.s.d.
Cucumbers					
Yield (kg/plot)	67.5	83.0	69.6	55.0	11.7
Number/plot	108	136	115	105	22
Marketable (kg/plot)	44.5	53.4	47.2	41.0	9.0
Tomatoes					
Yield (kg/plot)	5.5	8.6	5.7	6.0	1.2
Lettuce					
Yield (kg/plot)	13.1	14.4	13.0	13.1	n.s.
% Marketable	91	95	94	95	n.s.
Tomatoes					
Yield (kg, marketable)	35.3	41.8	38.5	39.4	5.5