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TRANSPLANTING STUDIES WITH PROCESSING TOMATO
(Lycopersicon esculentum Mill.) AND GREEN SPROUTING
BROCCOLI (Brassica oleracea L. var. italica Plenck)

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ABSTRACT

Field experiments were conducted to evaluate the performance of module-raised and bare-root seedling transplants of determinate tomato and green sprouting broccoli. In the tomato experiment, seedlings raised in 36 cm³ modules in a greenhouse and bare-root transplants raised in a seed-bed under cold frames were transplanted into a field at Hastings in October 1983. In the broccoli study, seedlings were raised in 36 cm³ modules and in seed-beds in a field and in a greenhouse and then transplanted into a field at Massey University in November 1984.

Tomato plants established as module-raised transplants had higher shoot and root dry weights 35 days after transplanting, and flowered 2 weeks earlier than plants established as bare-root transplants. A series of nine destructive harvests, at approximately weekly intervals, revealed similar patterns of red fruit yield with time for plants established from the two types of transplant. The loss of the early growth advantage of the plants established from module-raised transplants was not explained by conversion to a thermal time scale. Further research is required to determine if the sharp peak of red fruit yield with time recorded in this experiment is typical for tomato crops grown in New Zealand.

The growth of broccoli plants over the first 32 days from transplanting was recorded from unreplicated plots. From the results of a series of dry weight harvests, it was estimated that, 18 days after transplanting, broccoli plants established as module-raised transplants produced in the field and in the greenhouse were 7 and 5 days, respectively, more advanced in terms of shoot dry weight than plants established from the corresponding bare-root treatments. Plants established from module-raised transplants initiated terminal inflorescences earlier than plants established from the corresponding bare-root transplants. These results were attributed to reduced root disturbance at transplanting for the module-raised transplants.

The effects of transplant type on the maturity and yield of broccoli were evaluated using a series of selective harvests in a replicated experiment. In the case of the field-raised transplants, the more rapid establishment and earlier initiation of the terminal head of plants established from module-raised transplants was reflected in earlier maturity at harvest. There was no difference in the time to maturity of module-raised and bare-root transplants raised in the greenhouse.

The patterns of post-transplanting growth and maturity of plants raised in modules in the greenhouse and transplanted with or without growing medium around the roots were very similar. This indicated that reduced root disturbance was a more important factor in the rapid establishment of module-raised transplants than the presence of a reserve of water in the growing medium of the module.

These results with tomato and broccoli illustrate that earlier and more uniform establishment of module-raised transplants may not always be reflected in earlier and more uniform crop maturity, due to the effects of environmental factors and inter-plant competition later in the growth of the crop. It is suggested that differences in crop maturity and yield between plants established from module-raised and bare-root transplants would have been more marked under more stressful field establishment conditions.

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TABLE OF CONTENTS

	<u>Page</u>
Abstract	ii
Acknowledgments	iv
Table of Contents	v
List of Figures	x
List of Tables	xi
List of Plates	xii
List of Appendices	xiv
Introduction	xv
1. REVIEW OF LITERATURE	1
1.1 Aspects of the production of tomatoes for processing in New Zealand	1
1.1.1 Introduction	1
1.1.2 Historical background to processing tomato crop culture in New Zealand	1
1.1.3 The role of transplanting as a means of establishing the crop	2
1.2 Aspects of production of green sprouting broccoli	7
1.2.1 Introduction	7
1.2.2 Rationale for the current use of transplants to establish the crop	7
1.2.3 Cultural treatments influencing yield and uniformity of maturity	9
1.2.3.1 Method of establishment	9
1.2.3.2 Stage of growth at transplanting	10
1.2.3.3 Direct manipulation of initiation of reproductive growth	12
1.2.3.4 Lateral head production and plant breeding	15
1.2.4 Harvesting regimes and the importance of harvest uniformity	16
1.2.4.1 Introduction	16
1.2.4.2 Selective harvesting	16
1.2.4.3 Once-over harvesting	17

1.2.5	Plant spacing of broccoli: research results and current practices	19
1.2.5.1	Yield-density relationship	19
1.2.5.2	Plant density and mean head size	20
1.2.5.3	Plant density and crop maturity	20
1.2.5.4	Plant density of process crops grown in the Manawatu	21
2.	FIELD EVALUATION OF TWO TYPES OF TOMATO TRANSPLANT	23
2.1	Introduction	23
2.2	Materials and Methods	24
2.2.1	Introduction	24
2.2.2	Selection of cultivar and source of seed	24
2.2.3	Methods of raising transplants	24
2.2.3.1	Bare-root transplants	24
2.2.3.2	Module-raised transplants	25
2.2.4	Transplanting method and maintenance of experiment in the field	26
2.2.4.1	Preparation of experimental area prior to transplanting	26
2.2.4.2	Transplanting method	29
2.2.4.3	Maintenance of experiment after transplanting	29
2.2.5	Experimental design, data collection and analysis	29
2.2.5.1	Experimental design	29
2.2.5.2	Collection of data	30
2.2.5.2.1	Harvest at transplanting	30
2.2.5.2.2	Harvest following establishment	31
2.2.5.2.3	Fruit fresh weight harvests	31
2.2.5.2.4	Fruit numbers	32
2.2.5.3	Analysis of data	33
2.2.5.3.1	Harvest at transplanting	33
2.2.5.3.2	Harvest following establishment	33
2.2.5.3.3	Fruit fresh weight harvests	33
2.2.5.3.4	Fruit numbers	34

2.3	Results	35
2.3.1	Harvest at transplanting	35
2.3.2	Harvest following establishment	35
2.3.3	Fruit fresh weight harvests	36
2.3.4	Fruit numbers and maturity indices	39
2.4	Discussion	43
2.4.1	Raising of transplants	43
2.4.2	Field establishment and early growth	44
2.4.3	Post-establishment growth and yield	44
2.4.3.1	Introduction	44
2.4.3.2	Time of maturity	44
2.4.3.3	Uniformity and yield	47
2.4.4	Practical implications of the observed patterns of maturity and yield	48
2.4.4.1	Pattern of yield with time	48
2.4.4.2	Implications for yield assessments in tomato field research	50
2.4.4.3	Implications for commercial crop production and direction of field research	54
3.	FIELD EVALUATION OF TYPES OF GREEN SPROUTING BROCCOLI TRANSPLANT	60
3.1	Introduction	60
3.2	Materials and methods	61
3.2.1	Selection of cultivar and treatment of seed	61
3.2.2	The treatments	61
3.2.3	Methods of raising transplants	62
3.2.3.1	Field-raised transplants	62
3.2.3.1.1	Sowing of field seed-bed	62
3.2.3.1.2	Sowing of field seedling trays	63
3.2.3.1.3	Management of field-raised seedlings	64
3.2.3.2	Greenhouse-raised transplants	64
3.2.3.2.1	Sowing of greenhouse seed-bed	64
3.2.3.2.2	Sowing of greenhouse seedling trays	65

3.2.3.2.3	Management of greenhouse-raised seedlings	65
3.2.4	Transplanting of seedlings and maintenance of experiments in the field	65
3.2.4.1	Introduction	65
3.2.4.2	Preparation of experimental area prior to transplanting	66
3.2.4.3	Preparation of seedlings for transplanting	66
3.2.4.3.1	Transplanting date	66
3.2.4.3.2	Field-raised bare-root transplants	66
3.2.4.3.3	Field-raised module transplants	67
3.2.4.3.4	Greenhouse-raised bare-root transplants	67
3.2.4.3.5	Greenhouse-raised module transplants	67
3.2.4.2.6	Selection of seedlings for transplanting	67
3.2.4.4	Method of transplanting	68
3.2.4.5	Maintenance of experiments following transplanting	68
3.2.5	Experimental design, data collection and data analysis	69
3.2.5.1	Experimental design	69
3.2.5.2	Data collection	69
3.2.5.2.1	Collection of observation experiment data	69
3.2.5.2.2	Collection of main experiment data	83
3.2.5.3	Data analysis	85
3.2.5.3.1	Observation experiment	85
3.2.5.3.2	Main experiment	85
3.3	Results and discussion	87
3.3.1	Seedling emergence, seedling densities and size of transplants	87
3.3.1.1	Seedling emergence and densities	87
3.3.1.2	Transplant size	88
3.3.2	Environmental conditions during early establishment	90
3.3.3	Observation experiment - results and discussion	90
3.3.3.1	Leaf, stem and shoot growth	90
3.3.3.2	Relationships between plant parts	92
3.3.3.3	Uniformity of crop establishment	106
3.3.3.4	Head development and leaf numbers	107
3.3.3.4.1	Efficacy of methods of examining stem apices	107
3.3.3.4.2	Leaf number and head initiation	108
3.3.4	Main experiment - results and discussion	114

3.3.4.1	Results of main experiment	114
3.3.4.1.1	Missing data: causes and handling	114
3.3.4.1.2	Effects of methods of transplant production on yield, maturity and head quality	116
3.3.4.1.3	Effects of row location on maturity and head size	121
3.3.4.2	Discussion of main experiment results	125
3.3.4.2.1	Plant losses	125
3.3.4.2.2	Time to maturity	126
3.3.4.2.3	Spread of maturity	130
3.3.4.2.4	Yield	131
3.3.4.2.5	Row location	135
4.	SUMMARY, CONCLUSIONS AND GENERAL DISCUSSION	137
	LITERATURE CITED	146
	APPENDICES	165

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
2.1	Fruit fresh weight yields (t ha^{-1}), in four fruit grades, from bare-root and module-raised transplants of tomato at Hastings.	40
3.1	Change in natural logarithms of shoot dry weight with time from transplanting of broccoli plants.	94
3.2	Change in natural logarithms of leaf dry weight with time from transplanting of broccoli plants.	96
3.3	Change in natural logarithms of stem dry weight with time from transplanting of broccoli plants.	98
3.4	Relationship between mean natural logarithm of leaf dry weight and mean natural logarithm of stem dry weight of broccoli plants.	100
3.5	Relationship between mean natural logarithm of shoot dry weight and mean natural logarithm of root dry weight of broccoli plants.	102
3.6	Root, stem and leaf dry weight as proportions of total dry weight of broccoli plants at Harvests 1 and 2 of observation experiment.	104
3.7	Cumulative number of heads harvested from inner, outer and all rows of a single plot of broccoli.	118

LIST OF TABLES

<u>Table</u>	<u>Page</u>
2.1 Dates on which fruit yield data were collected.	32
2.2 State of plants at transplanting. Means of three 10-plant samples (converted to the per-plant scale).	35
2.3 State of growth of plants 35 days after transplanting. Means of eight 8-plant plots expressed on a g plant ⁻¹ scale.	36
2.4 Means of fruit numbers and 'maturity indices' for two transplant types at each of three harvest dates. Means of four 8-plant plots.	42
3.1 Dates of harvest for observation experiment (days from transplanting)	70
3.2 Ratio of lsd's for specific comparisons of treatment means to 'approximate lsd' presented in Table 3.9.	86
3.3 Broccoli seedling emergence and plant populations during raising of transplants.	88
3.4 State of plants at transplanting. Means of ten plants of each treatment harvested 1 day after date of transplanting.	89
3.5 Coefficients of variation (%) of shoot dry weight.	107
3.6 Mean leaf numbers at the time of transplanting (Harvest 1).	109
3.7 Mean leaf numbers and terminal inflorescence (head) development following transplanting (ten-plant samples, Harvests 2 to 4).	110
3.8 Five-day means of daily maximum and minimum air temperatures and grass minimum temperatures during raising of transplants in the field.	112
3.9 Effects of method of transplant production on yield and maturity of broccoli.	117
3.10 Maturity data for plot illustrated in Figure 3.7.	120
3.11 Means and significant levels of F-tests from 'split-plot' analyses.	125

LIST OF PLATES

<u>Plate</u>	<u>Page</u>	
2.1	Bare-root tomato transplants in seed-bed on the day of transplanting	27
2.2	Module-raised tomato transplants in trays on greenhouse bench, 28 days after sowing	28
2.3	Representative plants, established from bare-root and module- raised transplants, 35 days after transplanting	37
2.4	End view of five of the experimental beds, 90 days after transplanting, at Hastings	38
3.1	Enclosure in which field module and field seed-bed broccoli transplants were raised	72
3.2	Broccoli seedlings of field seed-bed treatment on 23 October (21 days after sowing)	73
3.3	Broccoli seedlings of field module treatment on 23 October (21 days after sowing)	74
3.4	Broccoli seedlings of greenhouse seed-bed treatment emerging in seed-bed box on 23 October (4 days after sowing)	75
3.5	Stage of development of the two 'commercial' treatments - greenhouse module (left) - at Harvest 1 of observation experiment (1 day after transplanting date)	76
3.6	Stages of development of broccoli plants of all five treatments at Harvest 1 of observation experiment (1 day after transplanting date)	77
3.7	End view of experimental area, following irrigation, on day of transplanting	78
3.8	End view of experimental area, 4 weeks after transplanting	79
3.9	Broccoli plant of field-raised module treatment lifted from soil to show root growth 16 days after transplanting	80
3.10	Broccoli plant of field seed-bed treatment lifted from soil to show root growth 16 days after transplanting	81

- 3.11 Longitudinal section (80x) of vegetative stem apex of broccoli plant of greenhouse seed-bed treatment at Harvest 1 of observation experiment 122
- 3.12 Plant of greenhouse module treatment showing severe symptoms of 2,4,5-T damage (31 days after transplanting) 123
- 3.13 Terminal heads of broccoli after harvesting and trimming to 150 mm in length 124

LIST OF APPENDICES

<u>Appendix</u>		<u>Page</u>
1	Nutrient solution applied to module-raised seedlings	165
2	Pest and disease control programme for tomato experiment	167
3	Heat unit calculations for tomato experiment at Hastings	169
4	Lime and fertiliser applications for broccoli experiments	170
5	Pest and disease control programme for broccoli experiments	172