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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 cm<sup>3</sup> 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 cm<sup>3</sup> 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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