

Developments in fresh market tomato production

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The traditional method of growing tomatoes in southern Queensland has involved indeterminate cultivars grown on trellises with overhead irrigation and weed control by cultivation or herbicides. Crops are established by transplanting bare-rooted seedlings. However, the system has a high labour requirement and is suited to the intensively farmed areas close to centres of population.

With the shift of vegetable production to areas distant from centres of population there is more reliance on an itinerant labour force which is often unreliable in supply. A programme to improve the efficiency reduce the demands for labour, and contain costs in the production of fresh market tomatoes is in progress at Bundaberg. A system is being developed where determinate cultivars are grown on raised beds covered with plastic mulch with the aim of a once-over hand harvest. This system of growing is also readily adapted to mechanical harvesting.

The methods being used in the investigations involve initial small trials on growers' properties followed by larger areas grown on a commercial scale. Numerous cultivars have been imported from overseas and evaluated in the programme.

The results of a number of trials may be summarised as follows.

- Crop Establishment. The transplanting of container grown seedlings has resulted in more uniform tomato crops than where direct seeding, plug mix planting, or bare-rooted seedlings have been used for crop establishment. The use of container grown seedlings will become more important if the industry uses FI hybrids which have much higher seed costs.
- Plant Density. As plant density was increased from 14,300 to 338,600 plants per hectare, marketable fruit yield initially increased but then decreased, however, number of fruit per plant and mean fruit size decreased over the whole range. A compromise must therefore be made between yield and fruit size. It has been found that with the available cultivars the maturation period cannot be concentrated sufficiently to harvest a high percentage of the potential yield in a once over operation.
- Cultivars. Cultivars with jointless stems have proved desirable for hand harvesting because they can be picked faster with a reduction in harvest cost. Jointless varieties showing promise include the fixed lines Florida MN-I and Flora-Dade and two recently developed hybrids Duke and Count.
- Growth Regulating Substances. Daminozide (Alar (R)) applied as a foliar spray at 5000 ppm after the second hand has set fruit has been shown to prevent subsequent fruit set. The use of this chemical therefore has potential for concentrating the harvest period, but results have not been consistent enough to consider a recommendation to industry.

Further aspects to be investigated include the use of trickle irrigation and controlled fertilizing, particularly with nitrogen, under the full-bed mulch system. The raised bed production system has proved highly successful for tomato production on a sandy loam in an area with a mean monthly rainfall of 60 mm during the production period. The success of the system under higher rainfall incidence requires further investigation.