Nitrogen management in guava (*Psidium guajava* L) cv. LUCKNOW-49 through fertigation under North Gujarat conditions

N.M. PATEL, D.K. PATEL, AND L.R. VERMA

ABSTRACT

Various fertigation treatments were applied to study their effect on the growth, yield and economic parameters of guava. The four years pooled data revealed that number of fruits and fruit yield of guava were significantly highest with treatments F1L3 (60% recommended dose of nitrogen at 15 days intervals). However, F1L2 (80% recommended dose of nitrogen at 15 days intervals) was at par with that of F1L3. Fertigation with only 60% recommended dose of nitrogen at 15 days intervals was also found to be most economical and profitable fetching the highest net profit and the highest cost benefit ratio. So that, it can be concluded that farmers of North Gujarat should apply 60 per cent of the recommended dose of nitrogen at an interval of 15 days in the month of May-June and September-October. It gives 32 percent higher fruit yield and higher net return per hectare alongwith 40 percent saving of nitrogen.

**Key words:** Guava, Fertigation, Cost : benefit ratio

Guava (*Psidium guajava* L.) is an important one of the fruit crop of North Gujarat. Though it is grown in arid and semi-arid conditions, it responds well to nitrogen and farmers apply nitrogen in two splits in the month of June and September. Recently, drip irrigation system gets the prime position for efficient use of water and fertilizer. However, regular irrigation is essential during the reproductive phase (i.e. flowering to ripening of fruits) as irregular moisture conditions causes dropping of flowers and small fruits (Patil et al., 2002). Among different management practices, fertigation plays an important role for enhancing yield and quality of product with saving of water and efficient use of fertilizer. Water is a limiting factor in the arid regions. The fertilizers are becoming costlier day by day. Therefore, even under these constraints, it is essential to utilize both these inputs on the scientific basis to get a remunerative crop. Drip system increases the growth and nutritional status of pomegranate under the salt affected soils. (Dwivedi et al., 1996) by leaching out excess salt and maintaining proper concentration through continuous dropping of water. This system also checks seepage and evaporation loses (Varsney et al., 1993). However, there is no information available on the effect of fertigation on this fruit crop under North Gujarat conditions. Therefore, the present study was undertaken to generate information on the above aspects.

**MATERIALS AND METHODS**

A field trial on guava cv. L-49 was conducted at Fruit Research Station, Dehgam, Di: Gandhinagar during 2001-05. The twelve years old plants grown at 6.0 m x 6.0 m spacing were used for the experiment. Total nine treatments were laid out with four replications in Randomized Block Design. In this study two levels of irrigation i.e. 15 days interval (F1) and 30 days interval (F2) during May to June and September to October through drip (0.5 PEF) were applied and four levels of nitrogen viz., 100% (L1), 80% (L2), 60% (L3) and 40% (L4) of recommended doze of nitrogen (500 g / tree) were also applied and studied their interaction effect also. Existing practice i.e. 100% recommended doze of nitrogen was also tested.

**RESULTS AND DISCUSSION**

The results obtained from the present investigation as well as relevant discussion have been summarised.
under following heads:

**Number of fruits:**

The total number of fruits (Table 1) was found non
significant under both levels of irrigation through drip (0.5 PEF) application in all the years of study except 2003-2004.

Application of 60% and 80% of recommended dose of nitrogen were found significant response during all the years and pooled data except in the year 2005-06.

Interaction effect of F x L was also found significant during all the years of study. The treatment F1L1 produced significantly the highest number of fruits of 687, 532, 525, 640 and 596 during 2001-02, 2003-04, 2004-05, 2005-06 and in pooled results, respectively. However it was at par with F1L2 during 2001-2002, 2003-04 and in pooled results. In the year 2005-06 it was at par with all the treatments except F1L1 and F1L3, during 2004-05, it was at par with F2L2, F1L2 and F2L4.

**Fruit yield:**

The four years results (Table 2) revealed that fruit yield of guava was affected significantly during 2001-02, 2003-04 and in pooled results in respect of frequency of irrigation. F1 i.e. 15 days interval of water application gave significantly the highest fruit yield 18.21 t/ha, 18.87 t/ha and 18.45 t/ha during 2001-02, 2003-04 and 2005-06 and pooled, respectively.

Whereas, application of 60% recommended dose of nitrogen gave significantly the highest fruit yield of guava during 2001-02, 2003-04, 2005-06 and pooled results also. (18.98 t/ha, 19.49 t/ha, 23.68 t/ha and 19.26 t/ha, respectively). In the year 2001-02, 2003-04, 2005-06 and pooled, application of 80% recommended dose of nitrogen was at par with L3 (i.e. 60% recommended dose of nitrogen)

Interaction effect of F x L was found significant during 2004-05, 2005-06 and in pooled results. Treatment F1L3 (i.e. application of irrigation at 15 days interval with 60% recommended dose of nitrogen) recorded significantly the highest fruit yield of 17.65 t/ha, 26.99 t/ha and 21.52 t/ha during 2004-05, 2005-06 and in pooled results, respectively.

**Economics:**

Economics of different treatments (Table 3) revealed that the highest gross realization per hectare of Rs. 86,080 was obtained under treatment F1L3 (60% RDN at 15 days intervals). It was followed by F1L2 (80% RDN at 15 days intervals) (Rs.77,480/ha), giving the highest net realization of Rs.63,656/ha. The second highest with

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Yield kg/ha</th>
<th>Gross income Rs/ha</th>
<th>Cost of cultivation Rs/ha</th>
<th>Net income Rs/ha</th>
<th>CBR</th>
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<td>16320</td>
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<tr>
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<tr>
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<tr>
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<tr>
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<td>22590</td>
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<td>2.90</td>
</tr>
</tbody>
</table>

* Selling price of guava = Rs. 4/- per kg

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respect to net realization (Rs. 54,923 / ha) was recorded by F₁L₂ (80% RDN at 15 days intervals). Same treatment F₁L₃ recorded highest cost benefit ratio (3.84).

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