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SHORT COMMUNICATION

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

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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. There fore, 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. There fore the present study was undertaken to generate information on the above aspects.

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 (F_1) and 30 days interval (F_2) during May to June and September to October through drip (0.5 PEF) were applied and four levels of nitrogen viz., 100 % (L_1), 80 % (L_2), 60 % (L_3) and 40 % (L_4) of recommended doze of nitrogen (500 gm / tree) were also applied and studied their interaction effect also. Existing practice i.e. 100 % recommended doze of nitrogen be also tested.

The total number of fruits 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 F_1L_3 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 F_1L_2 during 2001-2002,2003-04 and in pooled results. In the year 2005-06 it was at par with all the treatments except F_1L_1 ,and F_2L_3 during 2004-05, it was at par with F_2L_2 , F_1L_2 and F_2L_4.

The four years results revealed that fruit yield of guava was affected significantly during 2001-02, 2003-04 and in pooled results in respect of frequency of irrigation. F_1 i.e. 15 days interval of water application gave significantly the highest fruit yield 18.21t/ha, 18.87 t/ha and 18.45 t/ha during 2001-02, 2003-04 and pooled , respectively. Ram and Rajput (1998) also reported effect of slow release nitrogen fertilizer on higher yield and better quality of guava.

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 L_3 (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 F_1L_3 (i.e. application of irrigation at 15 days interval with 60 % recommended dose of nitrogen) recorded significantly

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Table 1. Effect of different treatments on number of fruits/tree of guava (2001-02 to 2005-06)

Treatments	Total number of fruits / tree				
	2001-02	2003-04	2004-05	2005-06	pooled
F_1L_1	563	434	298	459	438
F_1L_2	676	504	509	619	577
F_1L_3	687	532	525	640	596
F_1L_4	545	420	374	557	474
F_2L_1	586	385	400	567	485
F_2L_2	611	455	475	587	532
F_2L_3	587	440	382	536	486
F_2L_4	641	434	471	581	532
Control	597	413	464	428	475
C.D. at 5 %	40.83	42.94	71.02	100.05	32.68
C.V.%	4.54	6.48	11.25	12.03	9.02

Table 2. Effect of different treatments on fruit yield (t/ha)of guava (2001-02 to 2005-06)

Treatments	Fruit yield (t/ha)				
	2001-02	2003-04	2004-05	2005-06	pooled
F_1L_1	17.15	17.43	11.72	18.99	16.32
F_1L_2	18.94	20.03	15.67	22.83	19.37
F_1L_3	20.19	21.24	17.65	26.99	21.52
F_1L_4	16.56	16.79	12.47	20.53	16.59
F_2L_1	16.58	14.47	12.55	20.67	16.06
F_2L_2	17.49	18.09	15.60	22.18	18.34
F_2L_3	17.77	17.75	12.18	20.37	17.02
F_2L_4	17.01	17.38	15.30	21.42	17.78
Control	16.72	16.46	15.24	16.98	16.35
C.D. at 5 %	NS	NS	1.36	3.54	1.29
C.V.%	6.14	13.21	6.52	11.06	10.24

Table 3. Economics of Guava cultivation

Treatments	Yield kg/ha	Gross income Rs./ha	Cost of cultivation Rs/ha	Net income Rs./ha	CBR
F_1L_1	16320	65280	22690	42590	2.88
F_1L_2	19370	77480	22557	54923	3.43
F_1L_3	21520	86080	22424	63656	3.84
F_1L_4	16590	66360	22291	44069	2.98
F_2L_1	16060	64240	22640	41600	2.84
F_2L_2	18340	73360	22507	50853	3.26
F_2L_3	17020	68080	22374	45706	3.04
F_2L_4	17780	71120	22241	48879	3.20
Control	16350	65400	22590	42810	2.90

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

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 of different treatments revealed that the highest gross realization per hectare of Rs. 86,080 was obtained under treatment F_1L_3 (60 % RDN at 15 days intervals). It was followed by F_1L_2 (80 % RDN at 15 days intervals) (Rs.77,480/ha) , giving the highest net realization of Rs.63,656/ha . The second highest with respect to net realization (Rs. 54,923 / ha) was recorded by F_1L_2 (80 % RDN at 15 days intervals). Same treatment F_1L_3 recorded highest cost benefit ratio (3.84).

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 F_1L_3 (60 % recommended dose of nitrogen at 15 days intervals). However, F_1L_2 (80 % recommended dose of nitrogen at 15 days intervals) was at par with that of F_1L_3. 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 pert cent higher fruit yield and higher net return per hactare alongwith 40 per cent saving of nitrogen.

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