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Assessment of comparative performance irrigation practice during fruit development in Alphonso mango

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Abstract

The frontline demonstrations on protected irrigation in Alphonso mango during fruit development were conducted in 5 villages of Deogad tahsil of Sindhudurg district of Maharashtra during the fruiting season 2020. Among the selected growers for assessment of technology, 68.33 percent of farmers had a 'high' level of knowledge about irrigation to mango trees during fruit development stage, while 31.67 percent of respondents had a medium level of knowledge. None of the respondents were found in 'low' category of knowledge. The highest fruit retention at harvest (5.79 per cent) was found in irrigation practice. The increase in the fruit weight 4.19% was due to irrigation practice. The yield of mango fruits (153.2 fruits tree^{-1} and 36.2 kg tree^{-1}) was registered in the irrigation demonstration.

Keywords: Irrigation practice, Alphonso mango, irrigation demonstration

Introduction

Mango (*Mangifera indica* L.) is national fruit of India and has a distinctive position in global fruit trade. Owing to its wider adoptability to edaphic and ecological factors, it is grown throughout India comprising more than 45 per cent of total world production. In India, several mango cultivars are ruling and among them, 'Alphonso' is the choicest cultivar due to its peculiar characteristic like attractive colour and shape, delicious taste, appreciable flavour and long keeping quality. It is commercially cultivated in Maharashtra, Goa, Gujarat and Karnataka and has major share in total mango export. The Alphonso mango from Konkan region of Maharashtra has unique worth in the market and have prime value as it grown in the unique geographic territory having hard lateritic rocky area (Malshe *et al*., 2017) [4]. Though Alphonso is popular cultivar, there are certain limitations as it is irregular bearer, sensitive to deviations in weather and occurrence of spongy tissue. The flowering and fruiting in mango is complex and it is governed by several internal and external (Biotic and abiotic) factors. In mango, proper management during fruit development stage is also indispensable. For yield and quality improvement, several management practices during fruit development stage such as irrigation, use of nutrients and growth promoters, fruit bagging etc. have been recommended. Mango gives better response to irrigation and the protected irrigation @ 150 to 200 litre of water per tree at fortnight interval starting from pea grain stage to one month before harvesting time is recommended for reducing fruit drop. Though the growers are aware about the advantages of irrigation practice, it was not that much adopted since they suppose as tedious practice. The dissemination of such technology to grower community, demonstration is a ideal tool. Hence, to demonstrate this practice, the frontline demonstrations were organized and the its performance was evaluated.

Methodology

The frontline demonstrations on protected irrigation in Alphonso mango during fruit development were conducted in 5 villages of Deogad tahsil of Sindhudurg district of Maharashtra during the fruiting season 2020. The villages and the orchards were preferably selected in east part of the tahsil where the intensity of fruit drop was more in previous season. Before demonstrations, the knowledge level regarding technology of the selected mango growers in demonstration vicinity were tested. For demonstration, 6 orchards of uniform, 25 years old mango trees of cv. Alphonso were selected and total 30 demonstrations were conducted. The recommended management practices *viz*, nutrient management, application of paclobutrazol, plant protection, etc. were followed evenly. The irrigation @ 150 lit water at 15 days interval starting from pea grain stage to one month before harvesting time were given to demonstration plots and a block of control (No irrigation) was maintained for comparative study. The observations on fruit drop, fruit weight and yield were recorded. The data were analyzed statistically using standard procedure (Panse and Sukhatme, 1967) [6].

Results and Discussion

The data regarding knowledge of farmers about protected irrigation during fruit development in Alphonso mango in Deogad tahsil of Sindhudurg district in Table 1. It is revealed that 68.33 percent of farmers had a 'high' level of knowledge about irrigation to mango trees during fruit development stage, while 31.67 percent of respondents had

a medium level of knowledge. None of the respondents were found in 'low' category of knowledge. The present finding suggests that the sampled mango growers possessed an adequate knowledge regarding irrigation practice in mango, its important and technique. Similar findings are also reported by Jadhav (2009) [1], Latha (2009) [2] and Malshe *et al*. (2016) [3].

The data on effect of irrigation during fruit development stage on fruit retention percentage, fruit weight and yield in mango cv. Alphonso are presented in Table 2 indicate the significant improvement due to irrigation during fruit development stage in terms of fruit retention percentage, average fruit weight and yield per tree in mango cv. Alphonso. The highest fruit retention at harvest (5.79 per cent) was found in irrigation practice. The improvement was to a tune of 55.23%. However, the retention was 3.73 per cent in untreated trees (Control). The higher percentage of fruit retention might be due to supplementary moisture supply during fruit development stage which ultimately caused the reduction in the fruit drop. The similar results are also reported by Uddin and Amin (1994) [7] and Malshe *et al*. (2020) [5]. The maximum fruit weight (241.3 g) was recorded in the tress receiving irrigation while in untreated trees (Control), the fruit weight was 231.6g. This showed that the 4.19% increase in the fruit weight was estimated due to irrigation practice. Wei *et al*. (2017) [8] also reported the fruit weight improvement due to irrigation.

The yield of mango fruits (153.2 fruits tree^{-1} and 36.2 kg tree^{-1}) was registered in the irrigation demonstration which was significantly superior than the control (Table 2). The irrigation is beneficial for maintaining favourable water balance which is essential for the growth and development of the fruit. The results are in agreement with Wei *et al*. (2017) [8] and Malshe *et al*. (2020) [5].

Table 1: Knowledge level of farmers about protected irrigation during fruit development in Alphonso mango

Knowledge	Number of respondent (Frequency) (N = 60)	Percentage
Low (<33.33%)	0	0.00
Medium (33.34-66.66%)	19	31.67
High (>66.66%)	41	68.33

Table 2: Effect of irrigation during fruit development stage on fruit retention percentage, fruit weight and yield in mango cv. Alphonso

Parameters	Demonstration block (Irrigation during fruit development stage)	Control (Without irrigation during fruit development stage)	t' value	Improvement over control (%)
Fruit retention (%) At harvest	5.79	3.73	7.99*	55.23
Average fruit weight (g)	241.3	231.6	5.23*	4.19
Yield (No. of fruits tree^{-1})	153.2	122.3	8.12*	25.26
Yield (kg tree^{-1})	36.2	28.3	8.77*	27.91

(* Significant at 0.05%)

Conclusion

From the present study it is inferred that the irrigation during the fruit development period is supportive for fruit retention and yield improvement in Alphonso mango.

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