



Use of NAUROJI Novel Organic Liquid Fertilizer on Yield of Mango and Sapota

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ABSTRACT

To create awareness for use of NAUROJI Novel Organic Liquid Fertilizer and the adoption of new input in Mango var. Kesar and Sapota var. Kalipatti demonstrations were conducted during the year 2021-22 in different blocks of Navsari district viz., Navsari, Jalalpore and Gandevi. Use of NAUROJI Novel Organic Liquid Fertilizer spray resulted in higher yield (93.0 and 129.5 q/ha) compared to check plots (84.8 and 118.0 q/ha) in Mango and Sapota fruit crops, respectively. The yield increase compared to check field plots were 10.06 and 9.75 % in Mango and Sapota crops, respectively. The extension gap was recorded in Mango and Sapota crops were 8.50 q/ha and 11.50 q/ha. Similarly, the technical gap was recorded 12.00 q/ha in Mango and 20.50 q/ha in Sapota. The technology index recorded 11.43 % in Mango and 13.67 % in Sapota. The benefit-cost ratio was recorded higher in the demonstrated plot of Mango (1.90) and Sapota (1.74) fruit crops compared to the check plot. Moreover, net return in Mango was also recorded 14.65 % and 15.44 % in Sapota.

Key Words: Novel, Organic, Liquid Fertilizer, Extension gap, Mango and Sapota yield

INTRODUCTION

India ranks first in the production of Banana (26.08%), Papaya (44.05%), and Mango (45.89%). Its share in the world's fruit production is 11 per cent. The major mango producing countries include India, China, Thailand, Indonesia, Philippines, Pakistan, Brazil, Bangladesh, USA, Africa and Mexico. Adikshita *et al* (2018). To retain number one position, we have to make continuously efforts for better productivity. South Gujarat is known as a bowl of horticultural crops. Mango (*Mangifera indica* L.) and sapota [*Manilkara acharas* (Mill.)] are main fruit crops grown in Navsari district of Gujarat (Bhalekar and Chalak, 2016). Mango fruit is known as the King of Fruits. It has received throne of 'National fruit of India'. Mango occupies unique importance for its tasty, delicious and colourful appearance in the tropics. Similarly, sapota is also delicious fruit and famous as well as popular for milkshake ingredients. It is an incredible fruit which gives regular income to the farmer for 5 to 6 months in a year. Furthermore, both fruit trees give positive effect on environment, ecology, economy

and sustainability for livelihoods of farmers and employees operating along the value chains.

Less use of well-decomposed farm yard manure (FYM) and higher use of chemical fertilizers have given ill effects on overall soil health. This resulted in the deterioration of soil's physical and chemical properties resulting in stagnation in the yield of the crop and if the trend continues, it will have disastrous consequences (Hiwale *et al*, 2010). Sapota produces flowers in interval throughout the year in different flushes, but flowers and fruits tend to drop in different stages of development right from its setting to maturity. Whereas in mango flowering season comes only once in a year and if flower or fruit drop occurs, whole year of farmers becomes failure. The climate and weather play critical roles in the economic success or failure of tropical fruit tree species including commercial mango production. (Bindu and Renjan, 2022).

The medium black soil, warm and moist climate prevailing in Navsari district is well suited for mango and sapota fruit crops. However, fruit

Table 1 FLDs organized, area, participation and the average yield of district, state and national yield in Mango and Sapota during the year 2021-22.

Sr. No.	FLD organized			Area (ha)	Total Participant	National average yield (q/ha)	State average yield (q/ha)	District average yield (q/ha)
	Crop	Variety	Season					
1	Mango	Kesar	Kharif	7.00	95	96.64	74.20	91.92
2	Sapota	Kalipatti	Kharif	10.00	100	121.24	110.44	126.90

drop and flower drop are main obstacles for higher productivity. NAUROJI Novel Organic Liquid Nutrient formulation is good source of plant nutrients along with growth promoting substances like cytokinin, gibberellic acid *etc.* (Anonymous, 2014). Hence, to find out the effect of NAUROJI Novel Organic Liquid Nutrient in the farmer's field, KVK Navsari organized demonstrations on effect of NAUROJI Novel Organic Liquid Fertilizer on the yield of Mango and Sapota

MATERIALS AND METHODS

Krishi Vigyan Kendra, Navsari conducted the front line demonstration on scientific cultivation practices of major fruit crops of Navsari district *viz.*, Mango var. Kesar and Sapota var. Kalipatti in the Kharif season during the year 2021-22. Total 95 FLDs (Table 1) in an area of 7.00 ha for Mango and 100 FLDs in an area of 10.0 ha for Sapota crop in irrigated condition with good drainage facility were conducted on farmer's field of Navsari, Jalalpore, and Gandevi talukas (Block) of Navsari district.

The selection of the site, farmers and layout of the demonstration were followed as suggested by Choudhary (1999). A list of the farmer of the different village were prepared through survey and farmer's meeting and specific skill based trainings were given at the KVK campus regarding the different aspect of scientific cultivation practices and plant protection measures before conducting the FLDs. NAUROJI Novel Organic Liquid Fertilizer is patented product of Navsari Agricultural University. It is marketed with the brand name of Novel. Two times spray were given in both crops. In mango, spray was applied at the rate of 2% concentration at bud sprouting and flowering stage. Whereas in sapota, it was given at the rate of 1% for in the month of November and 30 days later of first spray. Moreover, farmers were informed to use recommended dose of fertilizers and manure (750-160-750g NPK/plant/year in Mango with 10 t/ha well decomposed Farm Yard Manure) and (1000-500-500 gram NPK/plant/year in Sapota with 10 t/ha well-decomposed FYM) for the demonstration

Table 2 Yield performances of FLDs organized on scientific cultivation practices during the year 2021-22

Sr. No.	Demonstration Detail	Yield obtained (q/ha)		Yield increase (%)	Potential yield of the demo variety (q/ha)	Extension gap (q/ha)	Technical gap (q/ha)	Technical index (%)
		Demo Average	Check Average					
1	NAUROJI NOVEL Organic Liquid Fertilizer Spray in Mango cv. Kesar	93.00	84.50	10.06	105.0	8.50	12.00	11.43
2	NAUROJI NOVEL Organic Liquid Fertilizer Spray in Sapota cv. Kalipatti	129.50	118.00	9.75	150.0	11.50	20.50	13.67

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Table 3 Expenditure and return performances of FLDs organized on scientific cultivation practices during year 2021-22

Sr. No.	Demonstration Detail	Expenditure and Returns (Rs./ha)								
		Demo				Check				Net Return increase percent
		Gross Cost (Rs/ha)	Gross Return (Rs/ha)	Net Return (Rs/ha)	B: C ratio	Gross Cost (Rs/ha)	Gross Return (Rs/ha)	Net Return (Rs/ha)	B: C ratio	
1	NAUROJI NOVEL Organic Liquid Fertilizer Spray in Mango cv. Kesar	1,22,522	2,32,500	1,09,978	1.90	1,15,322	211250	95,928	1.83	14.65
2	NAUROJI NOVEL Organic Liquid Fertilizer Spray in Sapota cv. Kalipatti	1,30,000	2,26,625	96,625	1.74	1,22,800	206500	83,700	1.68	15.44

plot for uniformity of application of fertilizer and manure. In the case of local checks, the traditional practices were followed by farmers. The benefit-cost ratio was worked out, from the collected data. The data on monetary returns and production cost were collected from a demonstration plot for the economic feasibility of Mango and Sapota crop cultivation. The technology gap, extension gap, and technology index were calculated as suggested by Eswaraprasad *et al* (1993) and Samui *et al* (2000).

RESULTS AND DISCUSSION

It was observed that yield of Mango was positively influenced by the use of NAUROJI Novel Organic Liquid Fertilizer. The maximum yield was recorded in the demonstration field plot (93.00 q/ha) compared to the check field plot (84.50 q/ha) in Mango var. Kesar. Similarly, in the case of Sapota, maximum yield was recorded in the demonstration field plot (129.50 q/ha) compared to the check field plot (118.00 q/ha). Similar results of increase in yield were recorded by Anonymous (2021 in Mango, Okra, Onion, Paddy, Sapota and Patel *et al* (2018) in mango. The NAUROJI Novel Organic Liquid Fertilizer spray also increased the yield percent (10.06 % and 9.75 %) in Mango and Sapota crops, respectively. The yield of the Mango demonstration plot (93.00 q/ha) recorded

a very less difference compared to (Table-1) the national average (96.64 q/ha) Anonymous (2018). However, the demonstration plot yield (93.00 q/ha) was recorded higher than the state average (74.20 q/ha) as well as the district average (91.92 q/ha) in Mango. Sapota demonstration plots recorded a higher yield (129.50 q/ha) compared to national (121.24 q/ha), state (110.44 q/ha) and district average (126.90 q/ha). The reason for the higher yield in the demonstration plot might be resulted due to the macro and micronutrients which present in NAUROJI Novel Organic Liquid Fertilizer and farm yard manure. The present study also corroborated with the findings of Anonymous (2011;2012;2014).

The potential yield (Table2) recorded in Mango var Kesar was 105.00 q/ha and Sapota var. Kalipatti was 150.00 q/ha in the Navsari district for 25 years old trees. The extension gap recorded in Mango was 8.50 q/ha and in Sapota crop, it was recorded 11.50 q/ha. This could be due to a lack of awareness about the scientific management of orchards, the use of organic manure and NAUROJI Novel Organic Liquid Fertilizer. Farmers were not aware of the use of NAUROJI Novel Organic Liquid Fertilizer and their usefulness in increasing crop yield sustainability. Therefore, it was needed to train the farmers regarding proper scientific cultivation

methods through farmers' meet, training as well as diagnostic visits and concept clearance. As far as the technical gap is concerned, it was recorded 12.00 q/ha in Mango and 20.50 q/ha in Sapota, which emphasized the need to educate the farmers through various extension means for the adoption of the scientific use of production technology. Moreover, the technology index illustrates the practicability of demonstration provided among the farmers. It was recorded 11.43 % in Mango and 13.67 % in Sapota. However, the Sapota crop showed more feasibility compared to the Mango.

The economic analysis (Table3) revealed that the gross cost recorded in NAUROJI Novel Organic Liquid Fertilizer demonstrated plot was 1,22,522 Rs/ha and 1,15,322 Rs/ha in the check plot of Mango. The increase in gross cost in the demonstration plot is due to the cost of NAUROJI Novel Organic Liquid Fertilizer and its charges of application in the field. The gross return recorded in the Mango demonstration plot was 2,32,500 Rs/ha, whereas in the check plot it was recorded 2,11,250 Rs/ha. The net return in the demonstration plot was 1,09,978 Rs/ha compared to check plot which was 95,928 Rs/ha. Similarly, the benefit-cost ratio was recorded higher (1.90) compared to the check plot (1.83). It may be due to better nutrients application.

In the case of Sapota fruit crop data revealed that gross cost recorded in NAUROJI Novel Organic Liquid Fertilizer demonstrated plot was 1,30,000 Rs/ha and 1,22,800 Rs/ha in check plot. The increase in the gross cost of demonstration plots is due to the cost of demonstration and its charges of application in the field. The gross return recorded in the Sapota demonstration plot was 2,26,625 Rs/ha. Whereas, in the check plot it was recorded 2,06,500 Rs/ha. The net return in the demonstration plot was 96,625 Rs/ha compared to check plot which was 83,700 Rs/ha. Similarly, the benefit-cost ratio was recorded as higher (1.74) compared to the check plot (1.68) of the Sapota fruit crop. The better performance may be due to better absorption of nutrients from the soil

which might have given better yield performance.

CONCLUSION

The present study revealed that the use of NAUROJI Novel Organic Liquid Fertilizer with well-decomposed FYM increased 10.06 % and 9.75 % yield as well as net return increase percent in the demonstration plot with 14.65 % and 15.44 % in Mango and Sapota fruit crops, respectively. Technical gaps and extension gaps existed between the use of demonstration and farmer's practices. It can be easily observed from the data that by application of technical knowledge adopting recommended practices and by improvement of extension activities farmers can reach up to potential yield.

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