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## Yield enhancement in mango crop with effective management of leaf hoppers and powdery mildew

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**Abstract**

A Front line demonstration was conducted on Management of leaf hoppers and powdery mildew in Mango crop at farmers fields of Nagarkurnool district, Telangana during the year 2016-17 to 2017-18. The main objective of front line demonstrations (FLDs) was to demonstrate study the efficacy of plant protection aspects for getting the higher yields. The demonstration comprised of two treatments viz., T1-Farmers practice (Sprayed Acephate 75% SP 1.5 gm/lt, Profenophos 50% EC 2ml/lt.of water) and T2-Demonstration (Sprayed Thiomethoxam 25% WG 0.3 gm/l + Wettable Sulphur 90% WDG 3g/l at flower initiation stage and Imidacloprid 17.8% SL 0.3 ml + Hexaconazole 5% EC 2 ml/ lt at bud formation to marble fruit stage).The results showed that drastically reduced the average incidence leaf hoppers and powdery mildew. In demo only 10.50% and in farmers practice 22.50% of incidence of leaf hoppers and powdery mildew was observed. The cumulative effects of technological intervention over two years, revealed that mean average fruit yield was 108.92 q/ha under demo and 94.27 q/ha in compared to farmers practice. Net returns and B: C ratios were found to increase in demonstrated plots over farmers practice.

**Keywords:** Mango hoppers, powdery mildew, front line demonstrations (FLDs), yield, pest incidence etc.

**Introduction**

Mango (*Mangifera indica* Linn.) is a very important and popular fruit in the world. In India Mango is cultivated in all most all the states. Mango is the fruit referred world over as the peach of tropics. Mango is considered as a king & national fruit of India, Pakistan, and the Philippines, and the national tree of Bangladesh. India is largest producer and consumer of Mango fruits in the world. Mango is a tropical and subtropical fruit crop grown in India over an area of 2.49 million hectares with production of 19.5 million tonnes contributing 40% of the total world production [1]. In India 90 million tonnes of fruits are produced of which 18 million tonnes comprised of Mango sharing 20% of the total fruit production. The major Mango producing states in India are Uttar Pradesh (23.72%), Andhra Pradesh (18.13%), Telangana (9.61%), Karnataka (9.46%), Bihar (7.28%), Gujarat (6.09%), Maharashtra (4.74%) and Tamil Nadu (4.36%) [2]. In the 2019 season, around 30% fewer mangoes were harvested compared to the 2018 season. This was not just due to alternate bearing, but also due to cold weather during the flowering period in January 2019. Biotic and abiotic factors are the major limiting factors in Mango because it is a perennial crop cultivated in diverse agro climatic & ecological zones. Weather and climatic factors of the country are more consignable for the attack of pests & diseases. In different regions of the world more than 300 insect pests have been recorded [3]. Among all the pests three Mango leaf hoppers *Amritodus atkinsoni* (Leth.), *Idioscopus clypealls* (Leth.) and *I. Nlveosparasus* (*nitidulus*) (Leth.) are most serious and wide spread pests which cause severe yield reduction in Mango crop. Almost all parts especially tender leaves, shoots, inflorescence and small fruits are attacked by the both nymphs and adults of the leaf hoppers. This result in flower drop, non setting of flowers and dropping of immature fruits, thereby reducing the yield. These leaf hoppers also excrete the honey dew which further allow the growth of black mildew fungi like *Meliola mangiferae* (Earle), resulting in growth of sooty mould on dorsal surface of leaves, branches, and fruits. This fungus coupled with honey dew spread the entire leaf and hamper the photosynthetic activity ultimately reduction in the

yield. The severe incidence of leaf hoppers and powdery mildew reduce the yield up to 50-60% in Mango [4]. But indiscriminately usages of pesticides not only reduce the pests & diseases but also reduce the natural enemies which are playing a major role in mango pollination which includes houseflies & honey bees. But non-judicious application of insecticides causing resurgence, resistance, residues and secondary pests outbreaks. Biologically active compounds play a significant role in reduction of leaf hoppers in Mango. A large number of investigators isolated and identified several chemical compounds from leaves and seeds of many plant species and screened out many insect feeding deterrents and growth inhibitors [5]. But still most of the farmers are not aware about the biologically, ecologically and economically safe compounds and they are using array of chemical compounds. To overcome this problem present demonstration was conducted to create awareness among the farmers usage of the newer compound in reduction of leaf hopper population and powdery mildew in Mango crop.

### Materials and Methods

Krishi Vigyan Kendra, Palem, has been conducted a Frontline demonstration on Management of leaf hoppers and powdery mildew in Mango crop in 20 locations under farming situations (Irrigated red soils) between 2016-17 and 2017-18 in 14 different villages located in different blocks under KVK operational area. Experimental research design was used for the study total population of 20 farmers (N=20) in whose plots FLDs were conducted along with control plot was taken into consideration for the study to find out the effect of

different spraying operations on pest & disease incidence. The area under each demonstration and control plots are 0.4 ha and 0.4 ha respectively from each location. The details are given in Table.1 The demonstration comprised of two treatments viz., T1- Farmers practice (Sprayed Acephate 75% SP 1.5 gm/lit, Profenophos 50% EC 2ml/lit. of water) and T2- Demonstration (Sprayed Thiomethoxam 25% WG 0.3 gm/l + Wettable Sulphur 90% WDG 3g/l at flower initiation stage and Imidacloprid 17.8% SL 0.3 ml + Hexaconazole 5% EC 2 ml/ lit at bud formation to marble fruit stage). Fifteen years old mango plants of planted at a spacing of 8 m x 8 m were selected in farmers fields of Nagarkurnool district to conduct the demonstration. Data on yields, expenditure incurred by the farmer on control (Farmers practice) and demo plots were collected and analyzed. Gross income was calculated based on local market prices of Mango and net income by subtracting the total cost of cultivation from gross income. Benefit:Cost ratio was computed by dividing gross returns with cost of cultivation as per [6]. The main aim of the demonstration is to reduce the indiscriminate usage of harmful pesticides and create awareness on need based usage of scheduled chemicals.

**Table 1:** Particulars of Front Line Demonstration

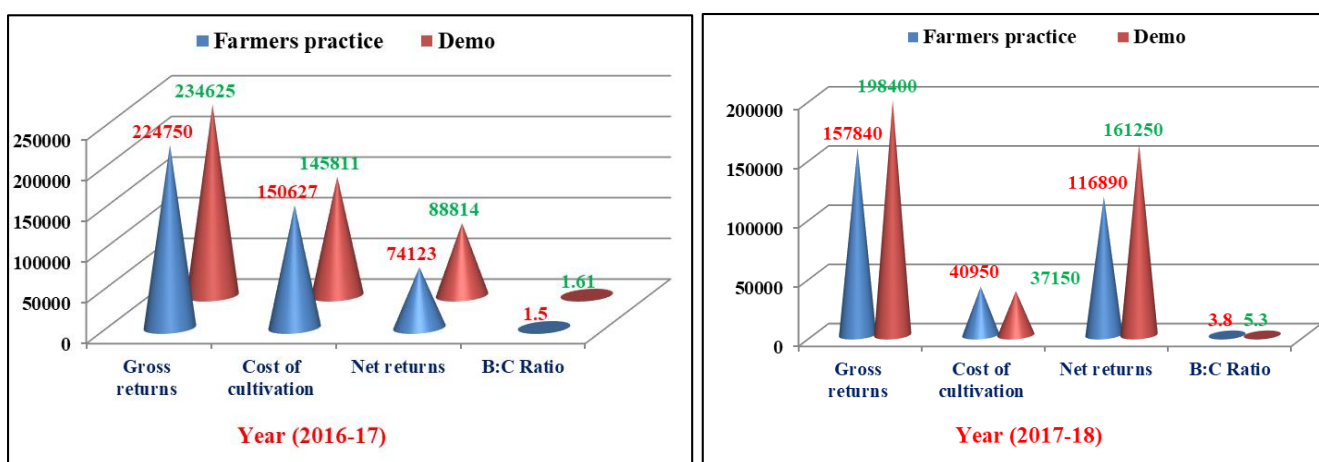
S. No	Year	No. of Villages	No. of locations	Area (ha.)	
				Farmers practice	Demo
1	2016-17	8	10	4	4
2	2017-18	6	10	4	4
3	Total	14	20	8	8

**Table 2:** Effect of pesticidal sprays on yield attributes of Mango

S. No	Year	Average pest incidence (%)		Average yield (q/ha)		Percentage of yield increase
		Farmers practice	Demo	Farmers practice	Demo	
1	2016-17	26	12	89.90	93.85	4.19
2	2017-18	19	9	98.65	124.0	26.17
3	Mean average	22.5	10.5	94.275	108.925	15.18

**Table 3:** Cost economics of Management of leaf hoppers and powdery mildew in Mango

S. No	Year	Gross returns Rs./ha		Cost of cultivation Rs./ha		Net returns Rs./ha		B:C Ratio	
		Farmers practice	Demo	Farmers practice	Demo	Farmers practice	Demo	Farmers practice	Demo
1	2016-17	224750	234625	150627	145811	74123	88814	1.50	1.61
2	2017-18	157840	198400	40950	37150	116890	161250	3.8	5.3
3	Mean average	191295	216512.5	95788.5	91480.5	95506.5	125032	2.65	3.455



**Fig 1:** Cost economics of Management of leaf hoppers and powdery mildew in Mango

### Results and Discussion

The first Spray of Thiomethoxam 0.3 gm/l + Wettable Sulphur 3g/l at flower initiation stage and Imidacloprid 0.3 ml

+ Hexaconazole 2 ml/ lit at bud formation to marble fruit stage was drastically reduced the average incidence leaf hoppers and powdery mildew. In demo only 10.50% and in farmers

practice 22.50% of incidence of leaf hoppers and powdery mildew was observed. The yield performance and average pest incidence (%) indicators are presented in Table 2. In farmers practice the reason behind the higher incidence of leaf hoppers and powdery mildew is mainly due to the continuously spraying of harmful insecticides only, which caused resurgence of pests. Studies on comparative efficacy of a schedule-based versus need-based application of insecticides against the mango hopper and showed that a schedule in which application of insecticides was combined with fungicides resulted in greater yield and kept the population of *A. atkinsoni* below the threshold level. Insecticides alone are not giving the adequate results hence combination of Imidacloprid 0.3 ml + Hexaconazole 2 ml/ lt given effective reduction of leaf hoppers and powdery mildew in Mango similar results are reported [7]. Closer planting, overcrowding of the plants, darkness & dampness, giving of excessive irrigations, presence of dead & diseased branches are the other factors associated with rapid multiplication and spread of leaf hoppers from one area to another. Therefore, keeping the orchard clean by regular ploughing, removal of weeds, pruning of dead, diseased and excess branches to increase supply of light to various sides of the trees are considered advantageous this ultimately change the micro canopy of the plants this leads reduction of pest incidence and increase the yield. The data presented in Table 2 revealed that under demo plot, the performance of mango yield was found to be substantially higher than that under control (farmer practices) during two years (2016-17 to 2017-2018). The cumulative effects of technological intervention over two years, revealed that mean average fruit yield was 108.92 q/ha under demo and 94.27 q/ha in compared to farmers practice. The year-to-year fluctuations in yield and cost of cultivation can be explained on the basis of variations in prevailing social, economical and microclimatic condition of that particular village. Our present findings are in lined with the earlier reporters [4] second spraying with Imidacloprid showed the highest efficacy in percentage of reduction of hopper population ( $92.50 \pm 9.02$ ) at 72 hours after treatment. It also showed the highest overall percentage of reduction of hopper population and less toxicity to natural enemies of mango hopper.

In Table.3 & Figure.1 all other economic parameters like Gross returns, Cost of cultivation, net returns and benefit cost ratio were presented. The data clearly revealed that, the net returns from the demo plot is substantially higher than control plot, i.e. farmers practice during all the two years of demonstration. The mean average net returns from demo plot is Rs. 1, 25,032.00/ha in compared to control i.e. Rs 95,506.00/ha similar findings were reported [6]. The cumulative effect of technological intervention over two years, revealed an average benefit cost ratio were 3.45 in compared to control 2.65. Higher yields were recorded by adopting the need based application of sprayings of chemicals compare to indiscriminately.

### Conclusion

The above study is clearly indicated that the combination of insecticides and fungicides are necessary compare to insecticides alone for effective management of Leaf hoppers & powdery mildew in Mango. Most of the farmers were approached the KVK, palem and followed need based spraying of chemicals instead of schedule sprayings.

### References

1. Thakor NJ. Indian Mango – Production and Export Scenario. Advanced Agricultural Research & Technology. 2019; 3:80-88.
2. Anonymous. Horticultural Statistics at a Glance 2015. Ministry of Agriculture & Farmers Welfare, Government of India. Published by Oxford University Press, New Delhi, India, 2016.
3. Patel JR, Shekh AM, Ratanpara HC. “Seasonal incidence and effect of minimum temperature and vapour pressure on the population of mango hoppers in middle Gujarat. Gujrat Agricultural University Research Journal. 2004; 20:5-8.
4. Adnan SM, Uddin MM, Alam MJ, Islam MS, Kashem MA, Rafii MY *et al.* Management of Mango Hopper, *Idioscopus clypealis*, Using Chemical Insecticides and Neem Oil. The Scientific World Journal. 2014; 1:1-5.
5. Jacobson M, Redfern RE, Mills GD. Naturally occurring insect growth regulators. II. Screening of insect and plant extracts as insect juvenile hormone mimics. Lioydia. 1974; 38(6):455-472.
6. Narayanaswamy G, Babu MRV, Narayana MA. Impact of Front Line Demonstration on Effect of Pruning on Yield Attributes and Quality of Mango cv. Benishan. International Journal of Current Microbiology and Applied Sciences. 2018; 7:530-534.
7. Shah AH. *et al.* *Amritocfus atkinsoni* Leth. *Pestology*, 1979; 3(8):26.