

Enhanced yield and fiscal benefit from mango (*Mangifera indica* L.) and guava (*Psidium guajava* L.) through automated drip fertigation

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■ **ABSTRACT** : Sustainable and increased agricultural productivity emphasize judicious use of water and nutrients accompanied by other factors. This can be achieved by application of water and nutrients through drip fertigation, which is the most advanced and efficient practice of fertilizer application. It has to follow appropriate management strategies to get maximum benefit, which become easy through automatic operation system. Therefore, an automated drip fertigation system was installed in mango (*Mangifera indica* L.) and guava (*Psidium guajava* L.) orchards at the farm of Central Institute of Agricultural Engineering, Bhopal, Madhya Pradesh. Irrigation and fertilizers were provided to mango and guava as per crop water requirement and scheduling. The mean fruit yield of guava under automated drip fertigation system was found to be 10.29-13.07 tonnes/ha and increased by 27.03 per cent during the period from 2007-08 to 2009-10. It increased significantly from 15.6 per cent to 23.7 per cent over conventional system during the same period. The pulp content of guava varied between 95.4 - 95.5 per cent and was higher by 1.38-1.60 per cent as compared to conventional system. The mean fruit yield of mango was 8.00-12.80 tonnes/ha and increased to 60.0 per cent under automated drip fertigation. The mean fruit yield of mango significantly increased from 17.6 to 23.1 per cent over conventional practices. The pulp content of mango under automated drip fertigation ranged between 74.5 to 74.6 per cent being 3.33-3.47 per cent higher than conventional system during the study period. Total cost of cultivation through automated drip fertigation varied from Rs.1,56,383-Rs.12,17,913 and Rs. 1,73,775- Rs. 15,65,774 for guava and mango, respectively for one to 20 hectare area. The benefit cost ratio for mango and guava orchard reached 1.45 and 2.20 for 20 hectare area, respectively. This study indicated that automated drip fertigation system could be techno-economically feasible for use in 5-20 hectares of mango and 3-20 hectares of guava.

■ **KEY WORDS** : Mango, Guava, Automated drip fertigation, Increased yield, Techno-economic feasibility, Benefit cost ratio

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Fruits are diversified and rich source of vitamins, proteins, carbohydrates and minerals. Mango (*Mangifera indica* L.) and guava (*Psidium guajava* L.) are important fruit crops, accounting around one fourth of total fruit production of the country. Mango, called king of the fruits shares around 20.3 per cent of total fruit production of the country. The area under its cultivation has increased from 1.57 million ha to 2.29 million ha with production from 10.02 million tonnes to 15.18 million tonnes, respectively during 2001-02 to 2010-11 (National Horticulture Database, 2011). The mean productivity of mango in the country has increased from 6.4 to 6.6 tonnes/ha during last ten years.

The area under guava has increased from 1,54,600 ha to 2,05,000 ha with production from 1.72 million tonnes to 2.56

million tonnes, respectively during the same period. During last ten years its productivity has raised from 11.1 tonnes/ha to 12.0 tonnes/ha (National Horticulture Database, 2011). But, according to estimates, the per capita consumption of fruits in India is only around half the recommendation by the Indian Council of Medical Research and National Institute of Nutrition, Hyderabad (Srivastava, 2010). At the same time Indian agriculture is facing reduced availability of land and share of water for irrigation along with increasing cost of other inputs including fertilizers. Therefore, enhanced and sustainable fruit production and productivity are important for nutritional and nutraceutical self-sufficiency and security of ever increasing population of the country.

It could be realised by using improved production