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RESEARCH ARTICLE :

Effect of integrated nutrient management on flowering, fruit set, fruit growth and yield of guava (*Psidium guajava* L.) cv. ALLAHABAD SAFEDA

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SUMMARY : An experiment was undertaken at the central field of Department of Horticulture, Allahabad school of Agriculture, SHIATS, Allahabad (U.P.) during 2012(July) – 2013(January) with the entitled "Effect of Integrated Nutrient Management on Flowering, Fruit set, Fruit growth and Yield of Guava (*Psidium guajava* L.) cv.ALLAHABAD SAFEDA". The experiment was laid out in Randomized Block Design (RBD) with 10 treatments and 3 replications. For the investigation, different sources of organic and inorganic plant nutrients *viz.*, FYM, *Neem cake*, Vermicompost, Urea, DAP, MOP and Micro nutrients (B and Zn) in different combinations were used. The result was revealed that investigation of organic manures and inorganic fertilizers along with micro nutrients was more effective in increasing fruit growth, yield and quality of guava than the inorganic fertilizers alone. Among the various combinations, treatment T_5 (50% Recommended dose of NPK (300g N: 100g P_2O_5:200g K_2O Per tree) + 15 kg FYM + 5 kg *Neem* cake + Micro nutrients (0.3% B and 0.3% Zn)) was found the best over all the treatments in respect to physical parameters like days to first flower initiation (24.67 days), fruit yield per tree (62.01 kg) and fruit yield per hectare (9.67 tonnes), respectively.

KEY WORDS :
Organic manures, inorganic fertilizers, Flowering, Fruit growth, Yield, Guava

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BACKGROUND AND OBJECTIVES

Guava (*Psidium guajava* L.), the apple of the tropics is one of the most common fruit crop in India. It is the fourth most important fruit crop after mango, banana and citrus in the country and covers an area of about 2, 05,000 ha with production of around 24, 62,000 MT (metric tonnes) and productivity about 12.0 MT ha^{-1} [Indian horticulture data base, 2011]. It is quite hardy and remunerative crop. But the yield and quality of fruit is poor due to either no manuring or unbalanced manuring. Fertilizer experiment was conducted in India showed that guava has given high response to inorganic fertilizers along with organic manures. The integration of organic and inorganic fertilizers was more effective in increasing the fruit set (%), fruit growth and yield of guava fruits than the inorganic fertilizers alone. It is also helpful to reduce

the inorganic fertilizer requirement, restore the organic matter in soil and improve the physical, chemical and biological properties of soil. Similarly, application of zinc and boron might have cause rapid synthesis of protein and translocation of carbohydrates which ultimately led to increase fruit weight, diameter yield and quality of guava fruits. Hence, the present investigation was planned to chalk out nutritional schedule with a view to improve the fruit set (%), fruit growth and yield of guava.

RESOURCES AND METHODS

An experiment was carried out at central field of guava orchard, Department of Horticulture, SHIATS, Allahabad on 15 years old guava trees cv. ALLAHABAD SAFEDA during the year of 2012(July)- 2013(January). The trees were planted at 8×8 m distance and maintained under uniform cultural practices. The experiment was laid out in Randomized Block Design with 10 treatments and 3 replications. The soil of the experiment site was sandy loam, with a pH –6.9, organic carbon- 1.4% and nitrogen- 303 kg/ha, phosphorus- 12.6 kg/ha, potassium- 122 kg/ha. The various treatments were used in this study and the details about the treatments were given below: T_0 – Control, T_1 – RDF (600N:200P_2O_5:400K_2O g), T_2 – (75% RDF+ 25 kg FYM), T_3 – (75% RDF + 25kg FYM + Micronutrients *i.e.* B (0.3%), Zn (0.3%), T_4 – (50% RDF + 15kg FYM + 3kg *Neem* cake), T_5 – (50% RDF + 15kg FYM + 3kg *Neem* cake + Micronutrients *i.e.* B (0.3%), Zn (0.3%), T_6 – (50% RDF + 15kg FYM + 6kg Vermicompost), T_7 – (50% RDF + 15kg FYM + 6kg Vermicompost + Micronutrients *i.e.* B (0.3%), Zn (0.3%), T_8 - (25% RDF + 15kg FYM + 3kg *Neem* cake + 6kg Vermicompost), T_9 (25% RDF + 15kg FYM + 3kg *Neem* cake + 6kg Vermicompost + Micronutrients *i.e.* B (0.3%), Zn (0.3%). At the time of application of fertilizers, a trench of 30 cm width and depth, 1 m away from trunk of the tree was prepared. All the fertilizers were applied in trench and covered with the soil at pre flowering stage. Here, NPK were applied through urea, DAP, MOP, respectively and the micronutrients *i.e.* zinc (0.3%) through zinc sulphate and boron (0.3%) through boric acid were sprayed with the help of foot and pedal pump sprayer at the time of fruit setting stage and 1month after fruit set. The observations were recorded on days to first flower initiation , number of flowers per tree, % of fruit set, number of fruits per tree, fruit weight (g), fruit diameter (cm), specific gravity (w/v), fruit yield per tree (kg), fruit yield per hectare (tonnes).

OBSERVATIONS AND ANALYSIS

It is an evident from the data (Table 1 and 2) that physical parameters and yield were significantly influenced by the application of different sources of organic and inorganic plant nutrients.

Physical parameters :

Days to first flower initiatation:

The results revealed that the minimum days to first flower initiation (24.67) was recorded in the treatment T_5. It may be due to the supply of the nutrients to the

Table 1: Effect of integrated nutrient management on flowering, fruit set, fruit growth and yield of guava (*Psidium guajava* L.) cv. ALLAHABAD SAFEDA

Treat. No.	Days to first flower initiation	Number of flowers per tree	% of fruit set	Number of fruits per tree	Fruit weight (g)
T_0	30.00	269.33	57.08	153.67	126.00
T_1	28.33	386.67	59.16	227.33	154.55
T_2	27.33	389.00	63.97	239.00	143.55
T_3	26.00	336.00	62.86	209.33	163.22
T_4	28.00	566.67	59.56	335.33	166.77
T_5	24.67	447.33	70.12	314.33	197.55
T_6	28.67	341.67	69.85	235.67	202.99
T_7	25.67	419.67	60.26	252.33	185.22
T_8	27.67	377.00	65.10	245.00	140.22
T_9	25.67	331.33	72.99	241.33	198.77
S.E.±	1.269	45.291	3.910	35.025	2.776
C.D. (P =0.05)	2.690	96.017	8.290	74.253	5.884

tree as per the requirement of the crop which was induced first flower initiation significantly varied from other treatments.

Number of flowers per tree :

The maximum number of flowers (566.67) was recorded with the treatment T_4 which was on par with the treatment T_5 and the lowest number of flowers was recorded in untreated control (T_0). The maximum number of flowers was recorded mainly due to better vegetative growth and improvement in the physiological condition which caused higher % of flowering. The prolonged availability of nutrients during the growth period from organic manures might have enhanced the number of flowers. The results are agreement with the finding of Singh *et al*. (2007).

Fruit set (%) :

There has been a significant effect of different sources of organic and inorganic plant nutrients on the % of fruit set (Table 1). The highest fruit set % (72.99%) was recorded in the treatment T_9. While the lowest fruit set % (57.08%) was recorded in control. The fruit set % enhanced might be due to retention capacity of nutrients to a prolonged period from organic manures and its balanced availability when combination with inorganic fertilizers might have resulted in higher % of fruit set. The result is similar to the finding of Singh *et al*. (2007).

Number of fruits per tree :

The highest number of fruits (335.33) was recorded in treatment T_4. In contrast, yield was reduced because of less fruit weight and diameter was recorded in this treatment T_4 (Table 1) compare to other treatment combinations like T_6, T_9, T_5, T_7. The results are close conformity with the findings of Dhomane *et al*. (2011).

Fruit weight :

However, maximum fruit weight (202.99 g) was recorded in treatment T_6 which was on par the treatment T_9 (198.77 g) and T_5 (197.55 g). It might be due to this treatment T_6 had less number of fruits compare to treatment T_5 or combination of treatment T_6 supplied the nutrients as per the requirement of the crop. But in treatment T_5 both the number of fruits and fruit weight increased, respectively. It might be due to application of micro nutrients *i.e.* zinc (0.3%) and boron (0.3%) have caused rapid synthesis of protein and translocation of carbohydrates which ultimately led to increase fruit weight and also number of fruits per tree increased might be due to more fruit retention on the tree and less fruit drop because of increase in internal auxin levels through zinc mediated biosynthesis of tryptophan. The results are in conformity with the finding of Katiyar *et al*. (2008) and Athani *et al*. (2009).

Fruit diameter :

The data presented in Table 1. It was observed that treatment T_9 resulted in maximum fruit length (7.81 cm) and treatment T_6 resulted in maximum fruit width (8.53 cm), while minimum fruit length and width were recorded in control. The higher length of fruit due to combined

Table 2: Effect of integrated nutrient management on flowering, fruit set, fruit growth and yield of guava (*Psidium guajava* L.) cv. ALLAHABAD SAFEDA

Treat. No.	Polar diameter (cm)	Radial diameter (cm)	Specific gravity (w/v)	Fruit yield (kg/tree)	Fruit yield (t/ha)
T_0	5.57	6.07	0.59	19.32	3.01
T_1	6.02	6.52	0.69	35.24	5.49
T_2	5.70	6.30	0.66	34.30	5.35
T_3	6.14	6.84	0.72	34.08	5.31
T_4	6.79	7.15	0.67	56.01	8.73
T_5	7.73	8.25	0.79	62.01	9.67
T_6	7.59	8.53	0.82	47.75	7.44
T_7	7.15	8.05	0.78	46.76	7.29
T_8	5.37	6.17	0.65	34.43	5.37
T_9	7.82	8.42	0.81	48.06	7.49
S.E.±	0.083	0.069	0.086	8.079	1.261
C. D. (P = 0.05)	0.175	0.146	0.182	17.128	2.672

application of zinc and boron may be attributed to their stimulatory effect on plant metabolism because boron plays key role in cell division and elongation, whereas, zinc is an essential micronutrient for auxins and protein synthesis, seed production and proper maturity of fruit thereby effecting increase in the polar diameter of fruit. The results are agreement with the finding of Katiyar *et al.* (2008) and Athani *et al*. (2009).

Yield :

It is revealed from the data given in Table 2, that highest fruit yield per tree (62.01 kg) and fruit yield per hectare (9.67 tonnes) were recorded in the trees treated with 50% recommended dose of NPK + 15 kg FYM + 3 kg *Neem* cake + Micro nutrients *i.e.* Zn and B (T_5). The improvement in the yield and yield components may be attributed to integrated use of organic and inorganic plant nutrients along with micronutrients which influenced the plant metabolism favorably, individually and collectively increasing the photosynthesis which ultimately improved the yield and quality parameters.

Neem cake is rich in plant nutrients and in addition to that it contains alkaloids like nimbin and nimbidin, which have nitrification inhibiting properties and releases nitrogen slowly. Thus, apart from the nutrient content in the *Neem* cake, the retention capacity of nutrients to a prolonged period and its balanced availability might have resulted in producing better yield. The results are agreement with the finding of Maity *et al*. (2006) and Priyaawasthi and Shantlal (2009).

Conclusion :

From the present investigation it is concluded that among the different treatment combinations the treatment T_5 (50% recommended dose of NPK + 15 kg FYM + 3 kg *Neem* cake + Micro nutrients *i.e.* Zn (0.3%) and B (0.3%) was superior in respect to days to first flower initiation, fruit growth and yield of guava fruits cv. ALLAHABAD SAFEDA.

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REFERENCES

Athani, S.I. and Revanappa, Allolli T.B. (2009). Influence of organic and inorganic fertilizers on growth, fruit characters, nutrient content and yield in guava. *J. Ecobiol*., pp.131-137.

Dhomane, P.A., Kadam, A.S., Lakade, S.K. and Gharage, V.R. (2011). Effect of different sources of nitrogen on growth and yield of guava (*Psidium guajava* L.) cv. SARDAR.*Asian J. Hort.,***6** (1) : 92-95.

Indian Horticulture data base (2011). All India area, production and productivity of Horticulture crops, *National Horticulture Board, Gurgaon*: 4-7.

Katiyar, P.N., Singh.J.P. and Singh, P.C. (2008). Effect of nitrogen with or without zinc and organic manure on growth, yield and quality of guava (*Psidium guajava* L.) cv. SARDAR. *Asian J. Hort.,* **3**(2) : 283-286.

Maity, P.K., Das, B.C. and Kundu, S. (2006). Effect of different sources of nutrients on yield and quality of guava (*Psidium guajava* L.) cv.L-49. *J. Crop & Weed,* **2** (2) : 17-19.

Priyaawasthi and Shantlal (2009). Effect of calcium, boron and zinc foliar spray on yield and quality of guava (*Psidium guajava* L.). *Pantnagar J. Res.*, 7(2) : 223-225.

Singh, Virendra, Dashora, L.K., Rathore, R.S. and Meena, C.L. (2007). Flowering and yield of guava (*Psidium guajava* L.) cv. 'SARDAR' as influenced by various organic and inorganic sources. *Curr. Agric.*, **31**(1/2) : 67-71.