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RESEARCH NOTE

ROLE OF BIOFERTILISERS AND MANURES IN PRODUCTION OF GUAVA (*PSIDIUM GUAJAVA* L.) CV. ALLAHABAD SAFEDA

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Nutrietnhs mangement through organic surces is one of the components of organic farming. Consumers are getting more and more health conscious and will pay premium price for organically produced fruits and other farm produces. Organic manures have been used in various fruit crops. Lahav (2) found that application of farmyard manure increased growth, hastened flowering and increased yield of banana. Use of organic manures had also been recommended in mango (3). Keeping in view the new concept of organic farming which includes supply of nutrients through organic sources, mobilization and fixation of nutrients thorugh biofertilizers and their favourable effect on fruit crops, a long term experiment was laid out to find out the effect of organic manures and biofertilizers on yield and fruit quality of guava.

A long term field experiment was started with newly established plants of guava cv. Allahabad Safeda. In first year, equal quantity of farmyard manure (5 kg/plant) was applied to each plant. Experimental soil belonged to ustocrepts class exhibiting pH, 7.5 and electrical conductivity ranges from 0.11 to 0.17 mmhos/cm. Soil was coarse sandy loam in texture. Two green manure crops, daincha (*Sesbania aculeata* L.) were grown in the basins of guava plants during rainy seasons, three organic manures (6 kg each of neem cake, mustard cake and farmyard manure), two bio-inoculants (250 g culture of azotobactor and azospirillum) and humacil (humic acid) (10 ml/5 litre of water) were applied during the months of September each year. Culture of phosphorus solublizing bacteria @ 250g/ plant was applied with treatments receiving only azotobactor and azospirillum. Experiment wa laid out in randomized block design with three replications. Observations on number of fruits per plant, individual fruit weight (on the whole tree basis), size of fruits (diameter and length based on random five fruits sample) and yiel per plant were

Table 1. Effect of organic manures and biofertilizers on fruit characteristics and yield of guava

Treatments	Weight of Individual fruit (g)		Fruit diameter (cm)		Fruit length (cm)		Number of fruit/plant		Yield (kg)/plant	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
Azotobactor	256.44	246.57	8.40	7.25	8.30	7.25	23	111	5.96	14.25
Farmyard manure	199.13	190.91	7.26	7.16	7.06	7.16	96	172	19.77	19.76
Sunhemp	170.03	154.70	6.83	7.02	7.06	7.02	55	129	11.03	15.41
Neem cake	131.36	128.55	7.00	7.11	6.98	7.11	195	483	25.08	37.56
Azospirillum	197.87	190.95	6.56	7.06	7.03	7.06	38	61	7.64	7.13
Mustard cake	74.90	76.50	7.33	6.46	7.41	6.46	149	365	10.99	31.73
Sesbania	181.97	176.14	7.16	7.19	7.36	7.19	53	132	10.44	15.50
Humacil	187.70	177.31	7.03	7.15	7.23	7.15	44	78	8.77	9.13
Control	170.31	162.17	7.26	7.24	7.21	7.24	19	54	3.27	7.07
CD at 5%	29.55	36.17	NS	0.14	NS	0.14	67.14	56.42	10.51	4.04

Table 2. Effect of organic manures and biofertilizers on fruit quality

Treatment	Total Soluble Solid (°Brix)		Ascorbic acid (mg/100g fruit)		Reducing sugar (%)		Acidity (%)	
	1997	1998	1997	1998	1997	1998	1997	1998
Azotobactor	11.83	10.46	117.76	207.66	4.10	2.32	1.21	1.50
Farmyard manure	15.00	13.16	194.07	185.66	4.00	3.07	2.94	2.79
Sunhemp	12.00	10.66	192.33	192.00	4.27	2.07	2.03	2.31
Neem cake	12.40	14.00	197.45	198.66	4.85	3.12	2.72	2.72
Azospirillum	14.06	10.50	200.00	210.33	3.37	2.30	2.79	2.65
Mustard cake	11.66	12.00	115.94	203.33	4.51	2.98	1.14	2.01
Sesbania	12.00	11.16	205.76	208.33	3.59	2.34	1.62	2.10
Humacil	12.66	10.16	159.90	198.66	4.52	2.52	1.72	2.24
Control	14.00	11.16	96.37	195.33	4.30	2.63	1.23	2.32
CD at 5%	2.50	1.80	60.15	NS	0.71	0.57	0.98	0.44

recorded during both fruiting seasons. Fruit quality parameters, viz. total soluble solids were recorded using hand refractometer calibrated in ^{0}Brix, reducing sugars were determined by copper reduction method (1). titrable acidity was determined by N/10 NaOH using phenolpthalein as indicator and ascorbic acid content was determined in fresh harvested fruit as mg/100g fruti described by Johnson, 1948. Experimental data were statistically analyzed following the analysis of variance method given by Panse and Sukhatme (6).

The weight of individual fruit was favourably influenced by majority of the treatments in both the years of study. The fruit attained significantly highest weight (256.44g and 246.57g) than all other treatments in both the years in azotobactor applied plants. Treatments, farmyard manure and azospirillum though at par in inreasing the fruit weight (199.13g and 197.87g in 1997 and 190.91 and 190.95g in 1998), were significanly superior than sunhemp, neem cake, mustard cake and control in both the years (Table-1). Increase in fruit weight of acid lime by combined application of biofertilizers has been reported by Rajsekaran (5). The fruit dimeter and fruit length were not significantly affected by various treatments during 1997, however, during 1998, application of azotobactor significantly increased the two characteristics of fruits recording the highest values (7.25cm fruit diameter and length, respectively in 1998).

Though all the treatments increased the number of frutis per plant over control in both the years, neem cake, mustard cake and FYM produced significantly more number of fruits than the control and other treatments in 1997 (195, 149 and 96 fruits respectively). During 1998, only neem cake and mustard cake could produce significantly higher number of fruits (483 and 365, respectively) and compared to other treatments including control. Yield of guava in terms of weight was positively increased by all the treatments over untreated control both the years. However, the highest increse was recorded in neem cake applied plants during 1997 (25.08 kg/plant) and 1998 (37.56 kg/plant). Yield increase due to neem cake was significant over all other tratments except farmyard manure in 1997 and mustard cake in 1998 (Table 1). Highest increase in fruit number and yield (weight) was also reported in guava with the application of neem cake (4).

Though the total soluble soilds in the fruit juice during 1997 in some treatments was at par, a significant differnce was recorded in some others. The total soluble solids (14^{0}Brix) recorded in fruits obtained from neem cake applied plants was significantly higher than all other treatments except farmyard manure treated ones (13.16^{0}Brix) during 1998. Ascorbic acid content (205.76 mg/100g fruit) during 1997 was the highest in fruits obtained from sesbania treated plants, and it was significantly more than the control, azotobactor and mustard cake treated plants. Other treatments were at par with sesbania regarding ascorbic acid content. Values of TSS were at par with each other treatment. Reducing sugars which were the highest in neem cake trated plants were also at par with control both the years. No definite trend in acidity was recorded during 1997 and 1998 (Table 2).

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