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Standardization of pruning intensity and integrated nutrient management in meadow orcharding of guava (*Psidium guajava*)

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ABSTRACT

A study was conducted during 2007–08 to standardize the pruning intensity and integrated nutrient management in guava (*Psidium guajava* L). Pruning of 25% previous season growth (I_1) resulted maximum canopy volume (0.60 m^3), flowers/shoot (50.93) during both the years. However, pruning of 75% previous season growth (I_3) showed maximum fruit set (45.40%), fruit retention (44.55%), whereas 50% pruning of previous season's growth (I_2) resulted maximum leaf area of 56.30 cm^2, fruits yield/plant 5.13 kg, with B : C ratio of 4.32. Use of 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *Aspergillus niger* (F_5) resulted maximum canopy volume 0.69 m^3, leaf area (57.19 cm^2), flowers/shoot (49.12), fruit set (45.79%), fruit retention (44.76). Interaction effect of pruning and integrated nutrient management showed that 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *Aspergillus niger* + 25% per cent pruning intensity (F_5I_1) resulted maximum canopy volume 0.96 m^3, flowers/shoot (57.83), while 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *Aspergillus niger* + 75% pruning intensity (F_5I_3) resulted maximum fruit diameter 5.20 cm (polar) and 5.31 cm (equatorial), average fruit weight (158.06 g), average pulp weight (154.19 g), pulp seed ratio 39.93 during both the years. However, highest leaf area (59.46 cm^2) and fruit yield was obtained with 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *Aspergillus niger* + 50% pruning intensity (F_5I_2) 6.68 kg/ plant and 33.43 tonnes/ ha with B : C ratio of 4.33.

Key words: Integrated nutrient management, Meadow orchard, Pruning intensity

Guava (*Psidium guajava* L.) is one of the important fruits of the tropics and sub-tropics of the world. It belongs to family Myrtaceae. In Rajasthan, it ranks third after citrus and mango, and occupies an area of 1 988 ha with an annual production of 26 000 metric tonnes (DoH. 2004). The major guava growing districts in Rajasthan are Sawai Madhopur, Kota, Bundi, Ajmer, Udaipur and Chittorgarh. Guava is rich in vitamin C (75–260 mg/100 g pulp), pectin (0.5–1.8%), good source of thiamine (0.03–0.07 mg/100 g pulp) and riboflavin (0.02–0.04 mg/100 g pulp). Besides, guava fruit is also a good source of minerals, like phosphorus 22.5–40.0 mg/100 g, calcium 10.0–30.0 mg/100 g and iron 0.60–1.39 mg/ 100 g (Singh *et al*. 2003). In general, guava is cultivated largely through a traditional system, under which it is difficult to achieve desired level of production because large trees provide low production/unit area and need high labour inputs. Moreover, large trees take several years before they come into full bearing and increased overall cost of production/ unit area. Meadow orcharding in guava is one of the techniques where higher number of plants/unit area is accommodated compared with the conventional planting density. It not only provides higher yield but also provides higher net economic returns/unit area. Under meadow orcharding where fruiting start from the first year a precise level of pruning is also required to make the balance between vegetative and reproductive phase. Further, to maintain soil fertility and plant nutrient status, supply of proper nutrition is also required for sustaining the desired crop productivity. Keeping in view the present investigation, standardization of pruning intensity and integrated nutrient management under meadow orcharding of 'Lalit' guava was conducted.

MATERIALS AND METHODS

The experiment was conducted during 2007 and 2008, on uniform 2-year-old 'Lalit' guava plants planted at the spacing of 2 m × 1 m at Horticulture Farm of the Maharana Pratap University of Agriculture and Technology, Udaipur, which

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is situated at 24°35 N latitude and 24°42 E longitudes at an elevation of 579.5 m above mean sea level. The region falls under agro-climatic Zone IV A (sub-humid southern plains and Aravali hills) of Rajasthan. There were 4 levels of pruning intensity, namely unpruned plants as control (I_0) 25% (I_1), 50% (I_2) and 75% previous season growth (I_3) and 5 treatments of integrated nutrient management 100, 40, 100 g NPK/tree/year (F_1), 50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azospirillum* + *Pseudomonas fluorescens* (F_2), 50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azotobacter* + *Aspergillus niger* (F_3), 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azospirillum* + *P. fluorescens* (F_4) and 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger* (F_5) were applied alone and in combination with different levels of the pruning. The experiment was laid out in factorial randomized block design with 3 replications and 2 plants were kept in each treatment. As per the treatments full dose of phosphorus, potassium and organic sources were applied as a basal dose in July. While nitrogen was applied in 2 split doses, one with basal dose in July and another dose after fruit setting in October through basin method, however the pruning was done in February with the help of secateaur. Canopy volume was calculated as the method describe by the Samaddar and Chakrabarti (1988) and expressed in m^3.

The total number of flowers were counted on the 5 randomly selected shoots of whole plants and average numbers of flowers/shoot were calculated. Total number of flowers which set into fruits was counted and per cent fruit set was also calculated. The per cent fruit retention was calculated on the basis of initial fruit set and fruit reaches to maturity. Fruit diameter, polar and equatorial was taken with the help of vernier caliper. Average fruit weight was recorded with the help of electronic balance.

Mature fruits were harvested periodically in each treatment separately and the weight was recorded with the help of single pan balance and expressed in kg. Further, fruits/ha were calculated by multiplying the fruit yield/plant to the number of plants/ha.

The relative economics of different plant nutrients (inorganic, organic and biofertilizers) along with man power required for the pruning were determined on the basis of cost of treatment and fruit yield/plant as well as per hectare. The net income was obtained by subtracting the treatment cost from gross income. It was expressed on net excess income over the control.

RESULTS AND DISCUSSION

Growth characteristics

Canopy volume was exhibited (Table 1) maximum in I_1 (25% pruning of previous season growth) 0.60 m^3 as compared to I_3 (75% pruning of previous season growth) 0.0.24m^3. Further, F_5 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A niger*) resulted maximum canopy volume 0.0.69m^3 as compared to F_2 (50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azosprillum* + *P fluorescens*) 0.21 m^3. However, interaction effect of F_5I_1 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A niger* +25% pruning of previous season growth) showed maximum canopy volume 0.96 m^3.

Leaf area was influenced (Table 1) by pruning intensity I_2 (50% pruning of previous season growth) 56.30 cm^2 as compared to I_0 (control) 48.46 cm^2. However, integrated nutrient management resulted maximum leaf area in F_5 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A niger*) 57.19 cm^2 as compared to F_1 (100, 40, 100 g NPK/tree/year) 45.75 cm^2. The interaction effect was non-significant.

Since, pruning remove carbon-starved, fruiting exhausted shoots and promotes new leaf growth to build-up carbohydrates reserves for the next flowering and allows the sprouting of lateral buds which, ultimately influenced the canopy volume and other vegetative characteristic of the plants. This is in accordance with findings of Dhaliwal *et al*. (2000) in guava. Improvement in crop growth under the influence of *Azotobacter*, the microbial inoculants, which bring about fixation of atmospheric nitrogen through free-living N_2 fixers in rhizosphere. It also gave a variety of growth substances like indole acetic acid, gibberellins, vitamin-B and antifungal substances. The better efficiency of organic manures in combination with inorganic fertilizers might be due to the fact that organic manures would have provided the micronutrients such as zinc, iron, copper manganese, etc. in an optimum level. Application of organic manures would have helped in the plant metabolism through the supply of such important micronutrients in the early growth phase. Results are in accordance to Barani and Anburani (2004), and Shukla *et al*. 2009.

Flowering characteristics

Among different intensity of pruning treatment, I_1 (25% pruning of previous season growth) gave maximum number of flowers/shoot (50.93) compared with the control I_0 (39.07). Use of integrated nutrient management had significantly affected the number of flowers/shoot (Table 1). Highest number of flowers/shoot was recorded in F_5 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A niger*) 49.12 compared with F_2 (50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azosprillum* + *P fluorescens*) 39.83. Interaction effect was non-significant.

Fruit set and fruit retention were significantly influenced by different level of pruning, integrated nutrient management over the control. A perusal of Table 1 indicated that during both the years fruit set and fruit retention were highest in I_3 (75% pruning of previous season growth) 45.40 and 44.55%, respectively, compared with the control (no pruning). However under integrated nutrient management maximum fruit set and fruit retention were noticed in F_5 (50, 20, 50 g

Table 1 Effect of pruning intensity and integrated nutrient management and their interaction on canopy volume, leaf area, flowers/shoot, fruit set% and fruit retention of guava

Treatment	Canopy volume (m^3)	Leaf area (cm^2)	Flowers/shoot	Fruit set (%)	Fruit retention (%)
I_0	0.59	48.46	39.07	43.03(46.564)	42.18(45.089)
I_1	0.60	50.50	50.93	43.35(47.124)	42.48(45.610)
I_2	0.36	56.30	45.97	44.39(48.934)	43.42(47.240)
I_3	0.24	53.43	40.40	45.40(50.707)	44.55(49.225)
SEm±	0.028	0.707	1.266	0.659	0.476
CD (*P*=0.05)	0.079	1.991	3.566	1.856	1.340
F_1	0.63	45.75	45.00	42.98(46.478)	42.00(44.773)
F_2	0.21	50.54	39.83	43.11(46.700)	42.20(45.114)
F_3	0.22	53.10	42.62	43.70(47.733)	42.53(45.778)
F_4	0.50	54.27	44.62	44.63(49.362)	44.25(48.700)
F_5	0.69	57.19	49.12	45.79(51.387)	44.76(49.590)
SEm±	0.079	0.790	1.132	0.589	0.426
CD (*P*=0.05)	0.071	2.226	3.19	1.660	1.199
F_1I_0	0.88	39.91	40.67	41.27(43.518)	40.51(42.202)
F_1I_1	0.76	42.51	52.33	42.86(46.265)	41.89(44.410)
F_1I_2	0.50	53.18	50.00	43.65(47.640)	42.42(45.502)
F_1I_3	0.39	47.42	37.00	44.13(48.488)	43.27(46.978)
F_2I_0	0.25	48.07	36.00	42.12 (44.978)	41.13(43.268)
F_2I_1	0.31	48.41	43.33	43.04 (46.588)	41.60(44.075)
F_2I_2	0.16	53.58	40.00	43.03(46.572)	42.59(45.797)
F_2I_3	0.11	52.12	37.00	44.23(48.660)	43.46(47.317)
F_3I_0	0.21	48.98	39.33	42.90(46.335)	41.58(44.040)
F_3I_1	0.24	52.70	48.33	42.65(45.903)	41.56(44.010)
F_3I_2	0.34	56.38	44.17	44.27(48.727)	43.12(46.725)
F_3I_3	0.18	54.35	38.67	44.98(49.968)	44.05(48.337)
F_4I_0	0.13	50.36	38.00	44.01(48.273)	43.69(47.710)
F_4I_1	0.67	51.37	52.83	43.64(47.623)	43.72(47.772)
F_4I_2	0.63	58.92	45.67	44.87(49.780)	44.04(48.327)
F_4I_3	0.44	56.44	42.00	46.02(51.773)	45.57(50.993)
F_5I_0	0.25	54.97	41.33	44.84(49.715)	43.98(48.227)
F_5I_1	0.96	57.52	57.83	44.56(49.238)	43.73(47.783)
F_5I_2	0.52	59.46	50.00	46.12(51.950)	44.92(49.850)
F_5I_3	0.34	56.84	47.33	47.66(54.645)	46.43(52.500)
SEm ±	0.100	2.316	1.937	1.183	0.868
CD (*P*=0.05)	0.282	NS	NS	NS	NS

I_0 Control (no pruning), I_1 25% pruning of previous season growth, I_2 50% pruning of previous season growth, I_3 75% pruning of previous season growth, F_1 100, 40, 100 g NPK / tree / year (as control), F_2 50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azospirillum* + *P. fluorescens*, F_3 50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azotobacter* + *A. niger*, F_4 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azospirillum* + *P. fluorescens*, F_5 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*

NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*) 45.79% and 44.76% which were at par with F_4 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azosprillum* + *P. fluorescens*) as compared to F_1. The interaction effect was non-significant for fruit set and fruit retention.

Since flowering in guava occurs on current season growth, therefore pruning helps in getting new fruiting units and thus increases the number of flower/shoot. Dhaliwal *et al.* (2000), Dalal *et al.* (2000) found that severe pruning increased fruit set and individual fruit size but decreased fruit yield/tree in 25-year old 'Sardar'guava. The prolonged availability of nutrients during the growth period from vermicompost might have enhanced the flowering and increase the number of flowers. Present results are supported by the finding of Ram *et al.* (2005) and Athani *et al.* (2005) in guava.

Physical characteristics of fruits

Different level of pruning resulted maximum fruit diameter under treatment I_3 (75% pruning of previous season growth) both polar and equatorial 4.93 cm and 5.03 cm, followed by I_2 (50% pruning of previous season growth) and minimum in control (I_0). However, integrated nutrient management significantly affects the fruit diameter.

Maximum fruit diameter was in F_5 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*) 4.97 cm (polar), 5.08 cm (equatorial), followed by F_4 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azosprillum* + *P fluorescens*) and minimum in F_2 (50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azosprillum* + *P. fluorescens*) during both the years. Further, among various interaction maximum diameter was observed in F_5I_3 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger* + 75% pruning of previous season growth) 5.20 cm (polar) and 5.31 cm (equatorial), followed by (F_5I_2) 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger* + 50% pruning of previous season growth (Table 2).

Average fruit weight and pulp weight (Table 2) were significantly maximum in I_3 (75% pruning of previous season growth) 127.79 g and 123.84 g, respectively, compared with the control (I_0). Further, under integrated nutrient management maximum average fruit weight (142.81 g) and average pulp weight (138.68 g) were obtained with F_5 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*) as compared to F_2 (50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azosprillum* + *P. fluorescens*) 97.20 g and 92.74 g, respectively. Among interaction effect maximum average fruit weight was in F_5I_3

Table 2 Effect of pruning intensity and integrated nutrient management and their interaction on fruit diameter, fruit weight, pulp weight and pulp: seed ratio of guava

Treatment	Fruit diameter (polar) (cm)	Fruit diameter (equatorial) (cm)	Fruit weight (g)	Pulp weight (g)	Pulp : seed ratio
I_0	4.45	4.55	101.36	96.73	21.78
I_1	4.57	4.67	106.15	101.53	22.71
I_2	4.86	4.97	121.83	117.93	30.54
I_3	4.93	5.03	127.79	123.84	31.61
SEm±	0.010	0.011	0.746	0.741	0.038
CD (*P*=0.05)	0.029	0.030	2.102	2.087	1.078
F_1	4.54	4.64	101.65	97.26	22.51
F_2	4.37	4.47	97.20	92.74	21.16
F_3	4.78	4.88	106.17	101.93	24.96
F_4	4.85	4.95	123.58	119.44	29.85
F_5	4.97	5.08	142.81	138.68	34.82
SEm±	0.012	0.012	0.834	0.828	0.342
CD (*P*=0.05)	0.033	0.033	2.350	2.333	0.964
F_1I_0	4.30	4.40	93.11	88.41	18.83
F_1I_1	4.44	4.54	97.80	93.02	19.62
F_1I_2	4.66	4.76	105.03	101.06	25.49
F_1I_3	4.76	4.86	110.64	106.55	26.11
F_2I_0	4.10	4.19	88.41	83.55	17.16
F_2I_1	4.18	4.28	94.30	89.47	18.67
F_2I_2	4.57	4.68	102.44	98.41	20.43
F_2I_3	4.64	4.75	103.63	99.54	24.40
F_3I_0	4.56	4.66	90.68	85.81	18.73
F_3I_1	4.60	4.71	96.28	91.91	21.22
F_3I_2	4.95	5.06	114.08	110.20	28.63
F_3I_3	5.00	5.10	123.67	119.82	31.25
F_4I_0	4.63	4.73	104.72	100.23	23.05
F_4I_1	4.69	4.79	110.80	106.38	24.90
F_4I_2	5.02	5.13	135.86	132.05	35.07
F_4I_3	5.04	5.15	142.96	139.11	36.36
F_5I_0	4.66	4.77	129.89	125.65	31.14
F_5I_1	4.92	5.02	131.56	126.96	29.16
F_5I_2	5.09	5.20	151.75	147.93	39.06
F_5I_3	5.20	5.31	158.06	154.19	39.93
SEm ±	0.035	0.035	2.276	2.276	1.289
CD (*P*=0.05)	0.097	0.098	6.411	6.410	3.632

I_0 Control (no pruning), I_1 25% pruning of previous season growth, I_2 50% pruning of previous season growth, I_3 75% pruning of previous season growth, F_1 100, 40, 100 g NPK / tree / year (as control), F_2 50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azospirillum* + *P. fluorescens*, F_3 50, 20, 50 g NPK + 5 kg FYM enriched with *Azotobacter* + *A. niger*, F_4 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azospirillum* + *P. fluorescens*, F_5 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*.

(50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger* + 75% pruning of previous season growth) 158.06 g and pulp weight (154.19g), followed by F_5I_2 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger* + 50% pruning of previous season growth) 151.75 g and 147.93 g. Pulp/seed ratio of the fruit were significantly influenced by pruning, nutrient management and their interaction over control. Table 2 reveals that application of I_3 (75% pruning of previous season growth) produced higher pulp / seed ratio (31.61) in comparison to I_0 (no pruning) during both the years. The application of various integrated nutrient also exhibited beneficial effect on pulp / seed ratio. Maximum pulp/seed ratio (34.82) was obtained in F_5 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*) as compare to other treatments. Further, under interaction maximum pulp: seed ratio 39.93 observed in F_5I_3 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger* +75% pruning of previous season growth) as compared to other treatments during both the years.

The results are in the confirmation with Dhaliwal *et al.* (2000) found that fruit weight increased with pruning intensity in 3-year old trees of guava cv. 'Sardar'. The combined effect of inorganic, organic and biofertilizers proved to be better than effect of their individual use. This might be due to action of joint application of organic sources and chemical fertilizers which might have acted complementary and supplementary to each other and resulted into adequate slow but steady supply of nutrients. However, inorganic fertilizer application may led due to enhanced vegetative growth and photosynthesis which led to the accumulation of more carbohydrates and other metabolites ultimately translocation towards the tissue. The effect of these organic sources on physico-chemical properties imparts favourable soil structure for root growth, which influenced better growth as compared to chemical fertilizers. These results are in conformity with findings of Ram *et al.*(2005). A synergistic interaction between organic manures and biofertilizers has resulted in enhanced production of growth-promoting substances like gibberellic acid, indole acetic acid and dihydrozeatin which has positive influence on the physiological activity of the plants resulted in enhanced fruit length and diameter, which ultimately increased the average fruit weight.

Fruit yield

The 2-year pooled data presented in Table 3 reveals that various treatments had resulted significant increase in the fruits yield/plant and/ha as compared to absolute control. Among various level of pruning intensity maximum fruit yield was recorded in I_2 (50% pruning of previous season growth) (5.13 kg/plant and 25.63tonnes/ha). Further, under integrated nutrient management maximum fruit yield (6.38 kg/plant, 31.91 tonnes/ha) was obtained in F_5 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*) compared with other treatments. Whereas in interaction maximum yield was obtained in F_5I_2 (50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger* +50% pruning of previous season growth) during both the year (6.68 kg/plant and 33.43 tonnes/ha) as compared to other treatments. These findings were in close conformity

Table 3 Effect of pruning intensity and integrated nutrient management and their interaction on yield and B : C ratio of guava

Treatment	Yield (kg/plant)	Yield (tonnes/ha)	B : C ratio
I_0	4.81	24.05	4.03
I_1	4.91	24.57	4.09
I_2	5.13	25.63	4.32
I_3	4.68	23.43	3.87
SEm ±	0.003	0.0016	0.059
CD (*P*=0.05)	0.009	0.0044	0.167
F_1	3.68	18.40	3.52
F_2	3.98	19.89	3.79
F_3	4.80	24.01	4.79
F_4	5.58	27.88	3.79
F_5	6.38	31.91	4.51
SEm ±	0.003	0.0017	0.066
CD (*P*=0.05)	0.010	0.0049	0.187
F_1I_0	3.59	17.95	3.44
F_1I_1	3.86	19.30	3.72
F_1I_2	3.84	19.20	3.71
F_1I_3	3.43	17.15	3.21
F_2I_0	3.90	19.48	3.74
F_2I_1	3.92	19.59	3.70
F_2I_2	4.26	21.28	4.11
F_2I_3	3.84	19.21	3.63
F_3I_0	4.68	23.39	4.69
F_3I_1	4.83	24.14	4.79
F_3I_2	5.04	25.21	5.06
F_3I_3	4.66	23.30	4.61
F_4I_0	5.55	27.78	3.80
F_4I_1	5.62	28.12	3.81
F_4I_2	5.80	29.03	3.98
F_4I_3	5.32	26.60	3.57
F_5I_0	6.33	31.63	4.49
F_5I_1	6.34	31.71	4.45
F_5I_2	6.68	33.43	4.76
F_5I_3	6.17	30.87	4.33
SEm ±	0.007	0.0035	0.187
CD (*P*=0.05)	0.019	0.0098	NS

I_0 Control (no pruning), I_1 25% pruning of previous season growth, I_2 50% pruning of previous season growth, I_3 75% pruning of previous season growth, F_1 100, 40, 100 g NPK/tree/year (as control), F_2 50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azospirillum* + *P. fluorescens*, F_3 50, 20, 50 g NPK + 5 kg FYM enriched with *Azotobacter* + *A. niger*, F_4 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azospirillum* + *P. fluorescens*, F_5 50, 20, 50 g NPK + 5 kg vermicompost enriched with *Azotobacter* + *A. niger*.

with the findings of Chandra and Govind (1995) found maximum fruit yield (9.18 kg/tree) with 75% pruning in February, whereas good quality fruits obtained with 25% pruning in February in guava. The significant interactive effect as a consequence of organic sources and fertilizers are attributed to the favourable nutritional status of the soil resulting into increased biomass production of the crop. This may be attributed to favourable effect of neem cake, vermicompost and biofertilizers on microbial and root proliferation in soil, which caused solubilizing effect on native nitrogen, phosphorus, potassium and other nutrients. The results of the present study are in the conformity with Swarup and Wanjari (2000).

Relative economics

B : C ratio was significantly affected by pruning intensity and integrated nutrient management while interaction was non-significant (Table 3). Pruning level obtained maximum B : C in I_2 (50% pruning intensity of previous season growth) 4.32 as compared to I_3 (75% pruning intensity of previous season growth) during both the years. Further, F_3 (50, 20, 50 g NPK + 5 kg farmyard enriched with *Azotobacter* + *A. niger*) recorded maximum B : C ratio 4.79. However, interaction reveals that maximum B : C ratio (5.06) in F_3I_2 (50, 20, 50 g NPK + 5 kg FYM enriched with *Azotobacter* + *A. niger* + 50% pruning intensity of previous season growth) followed by in F_3I_1 (50, 20, 50 g NPK + 5 kg farmyard manure enriched with *Azotobacter* + *A. niger* + 25% pruning intensity of previous season growth) as compared to F_1I_3 (100, 40,100 g NPK + 75% pruning intensity of previous season growth).

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