



EVALUATION OF VARIOUS INTERCROPS IN GUAVA ORCHARD

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Abstract

Guava is an important sub-tropical fruit crop and has good nutritive value. Intercropping in guava orchard gives additional income to the growers in juvenile phase of the plant. The plant growth characters, *i.e.*, height and girth were influenced by intercrops (paddy, blackgram, ginger and pigeonpea). Intercrops blackgram and pigeonpea gave positive response. The yield and economics of various intercrops were discussed and ginger was found most profitable among others used as intercrops in guava orchards. The soil properties were also improved by the use of intercrops.

Key words : Guava orchard, soil properties, yield of guava, fertility status.

Introduction

Guava is an important commercial fruit crop grown in Madhya Pradesh and it is known as “Poorman’s apple”. Guava is generally planted in barren or wasteland or in bunds and the area between the plants remains fallow round the year or used for growing paddy and there is improper management of water, nutrients plant protection and other requirements of the plants. Therefore, the yield of guava is very low with inferior quality of fruits in the area and farmers hesitate in planting of guava in their fields. Intercropping in guava orchards increases productivity of the orchard as well as quality of the fruits by improving fertility status of the orchard soil. Intercropping gives additional income to the farmers during the juvenile phase of the guava plants. Hence, the experiment was conducted to standardized intercropping system in guava orchard for maximum gross and net return and to assess the effect of various intercrops on growth of guava plants.

Materials and Methods

The experiment was carried out in young guava orchard in the farmer’s field at village Jodhpur (M.P.) in the year 2002. Experimental field is sloppy and rainfed. Upland paddy is main crop of this area. Average annual rainfall of the area is more than 1200 mm. More than

80% rains precipitated during July and August. The intercrops pigeon pea, blackgram, ginger and paddy were grown in the inter space between guava plants. Pomegranate was planted between the guava plants as fillers for obtaining additional income during initial years and utilizing space between two plants of guava in rows. Recommended package of practices was followed for various intercrops, given in table 1. The observations were recorded for monthly incremental height, girth and canopy of base crop guava and yield of various intercrops taken. The yield and economics of the intercrops were also calculated. Paddy equivalent yield of intercrops was calculated. The experiment was replicated thrice in randomized block design. Statistical analysis was done by method given by Panse and Sukhatme (1985).

Results and Discussion

The data presented in table 2 obviously indicate that the soil fertility of the field increased though intercropping due to improvement in soil characters *i.e.* water holding capacity, pH, electric conductivity, organic carbon, available N, available P and available K etc. Apart from giving good returns, intercropping prevents weed growth, reduces nutrient loss through leaching and surface runoff and keeps harmful diseases and pests under control (Bose *et al.*, 1999).

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Table 1 : Production technology of intercrops.

Intercrops	Variety	Date of sowing	Date of harvesting	Spacing	Seed rate (kg/ha)	Fertilizer dose FYM, N:P:K (kg/ha)
Pigeonpea	ICPL-87	8.7.02	28.2.03	60x30	15	20t, 20:50:20
Paddy	JR-75	8.7.02	11.01.02	Broad casting	100	15t, 60:40:60
Ginger	Local	8.7.02	21.02.03	30x15	20 qt.	25t, 80:50:50
Blackgram	T-9	8.7.02	22.09.02	20x10	20	10t, 20:40:20

Table 2 : Soil analysis of the orchard.

Soil characters	Before sowing of kharif	After harvesting of rabi intercrop
Water holding capacity (weight)	27.1%	32.2%
pH	6.3	6.5
Electrical conductivity (dSm ⁻¹)	0.11	0.13
Organic carbon %	0.46	0.52
Available N (kg/ha)	208	216
Available P (kg/ha)	13.9	15.8
Available K (kg/ha)	401	411

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Texture : Sand - 26%
Silt - 50%
Clay - 24%

Textural class - Loam

The data presented in table 3 clearly indicated that the intercrops influenced the growth as well as yield of the base crop. It may be due to soil micro-climatic effect of the particular intercrops *i.e.* the legumes fix nitrogen and also add some biomass in terms of leaves, which are shedding after maturity.

The incremental height (2.30 cm) of guava plant was observed significantly higher with intercrops blackgram (without filler plant) followed by pigeonpea (without filler plants). The monthly incremental girth of base plant guava was found significantly higher (0.18 cm) with intercrop pigeonpea and blackgram with and without filler crops, respectively. Similar results were reported by Rajput *et al.* (1998) who observed maximum tree volume of mango in cowpea-potato rotation. Sarkar *et al.* (2004) also reported that the intercrops significantly influenced the height, girth and canopy of the mango.

The maximum gross return (Rs. 97,200) and net return (Rs. 51,200) were obtained from intercrop ginger (without filler plant) and were significantly higher over

Table 3 : Performance of base crop (guava) as well as intercrops.

Treatments	Monthly incremental height of guava (cm)	Monthly incremental girth of guava (cm)	Yield of intercrops (q/ha)	Gross return of intercrops (Rs.)	Net return of intercrops (Rs.)	Paddy equivalent yield of intercrops (q/ha)	B:C ratio
T ₁ Paddy +guava (without filler)	1.96	0.12	18	12,720	370.00	18.00	1.03
T ₂ Black gram +guava (without filler)	2.30	0.16	12	15,300	4300.00	26.67	1.39
T ₃ Ginger +guava (without filler)	1.96	0.11	162	97,200	51,200.00	180.00	2.11
T ₄ Pigeonpea +guava (without filler)	2.28	0.18	14	21,300	6,300.00	37.59	1.42
T ₅ Paddy +guava + pomegranate	2.08	0.40	16	11,640	140.00	16.00	1.01
T ₆ Black gram +guava+pomegranate	2.20	0.18	11	14,100	3,600.00	24.44	1.34
T ₇ Ginger +guava + pomegranate	1.90	0.12	152	91,200	46,200.00	168.89	2.02
T ₈ Pigeonpea +guava+pomegranate	2.16	0.21	13.5	20,575	6,575.00	36.85	1.46
CD at 5%	0.120	0.018	-	-	947.51	6.25	-

Prevailing rates:

Paddy Rs. 540/qt. + Rs. 3000/- (Approximate rates of Straw/ha.)
Ginger Rs. 600/qt.
Pigeonpea Rs. 1450/qt. + Rs. 1000/- (Approximate rates of Straw/ha.)
Blackgram Rs. 1200/qt. + Rs. 900/- (Approximate rates of Straw/ha.)

other intercrop treatments. Hore *et al.* (2004) also found good yield of ginger intercrop in arecanut plantation. The B:C ratio was also recorded higher (2.11) from intercrop ginger (without filler plants) followed by ginger (with filler plants). Bhua *et al.* (1998) also obtained higher cost : benefit ratio when mango was intercropped with tomato followed by cluster bean under Gujarat condition.

The paddy equivalent yield of intercrops was found maximum (180 q/ha) with ginger intercrop (without filler plant) followed by ginger (with filler plants).

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