INTERCROPPING OF PULSES IN COCONUT

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A field trial conducted during 1989 and 1990 in 40 year old coconut palms to evaluate the performance of different pulse crops as intercrops revealed that cowpea is the best suited and most remunerative intercrop and the next best being soybean and groundnut. However, intercropping in coconut with blackgram and greengram was not remunerative as they recorded poor yield.

INTRODUCTION

The practice of intercropping in coconut is in vogue since ancient times. Growth habit of the coconut palm and the pattern of its utilisation of soil nutrients and solar energy permits other crops to grow in compatible combinations (Nelliat *et al.*1974; Nair and Balakrishnan, 1976). A factor that decides the compatibility of crop combinations in a cropping system such as coconut culture is the ability of associated crops to come up under shade. This ability has been reported to vary widely between species of plants, there being varying degrees of yield decline (Lalitha Bai and Vikraman Nair, 1982). Thus proper selection of crops is a must to achieve success in intercropping. In an overpopulated country like India growing a food crop in association with other crops aids in stepping up food production to a great extent (Garg, 1961). Among seasonal crops, groundnut has been identified as a profitable intercrop in sandy loam soil (Sahasranaman, 1964) and in laterite and red sandy loam soils (Anon., 1959). However comparative information on the performance of other pulse crops as intercrops in coconut are limited. Hence the present study was undertaken.

MATERIALS AND METHODS

The trial was conducted at Kondaegoundenpalayam Village, Pollachi taluk of Coimbatore district in 40 year old East Coast Tall coconut palms during kharif 1989 and summer 1990. The intercrops were raised in the interspace between coconut palms leaving a 1.8 m. radius around the base of coconut palms where basins were formed. The coconut palms were spaced at 8m x 8m. The trial was laid out in a Randomised block design with seven replications. The intercrops were raised in plots of 5m x 3m size, in the interspace. Both intercrops and coconut received the normal cultural practices and manuring. The cultivation practices followed for various intercrops are presented below:

Observations were recorded at harvest on plant height, number of nodes per plant, dry matter production per plant, number of pods per plant and yield. Net returns and benefit cost ratio were also assesssed and are presented in tables 1 and 2. Cost of cultivation and price of produce of the different intercrops are presented in Annexure I.

RESULTS AND DISCUSSION

A) Growth and yield attributes

Cowpea recorded highest plant height, greater number of pods per plant and dry matter production compared to other crops. The growth of soybean, groundnut and greengram was also satisfactory. However, blackgram recorded the lowest values for the above growth attributes. In case of number of pods per plant soybean recorded the highest value followed by cowpea. Blackgram recorded the lowest number of pods per plant.

B) Yield and economics

Cowpea recorded the highest mean yield of 825 kg/ha followed by soybean (693 kg/ha) and groundnut (680kg/ha). Blackgram and greengram recorded poor yields of 225 kg/ha and 353 kg/ha respectively. With

Table-1

Intercrop grown	Scientific name	Variety	Duration (days)	Spacing adopted (cm)	Fertiliser dose-basal application (kg/ha)
Soybean	Gylcine max	Co.1	85-90	30x10	20-80-40 NPK/ha
Blackgram	Vigna mungo	Co.5	75-80	30x10	25-50 NP/ha
Greengram	Vigna radiata	Co.4	85-90	30x10	25-50 NP/ha
Cowpea	Vigna unguiculata	Co.3	80-85	45x15	25-50 NP/ha
Groundnut	Arachis hypogaea	Co.2	100-105	30x10	a)17-34-54 NPK/ha b) 200 kg Gypsum at pegging (45 days after planting) was applied.

regards to economics, cowpea recorded the highest net returns of Rs.2850/ha and a benefit cost ratio of 2.36. Groundnut and soybean recorded mean net returns of Rs.1260/ha and Rs.1065/ha and a benefit cost ratio of 1.36 and 1.45 respectively. It is seen that though soybean recorded lesser net returns compared to groundnut, the return per rupee invested (B-C ratio) was more in soybean, which is attributable to the lower cost of cultivation of the crop compared to groundnut. Blackgram recorded negative net returns and a B-C ratio of 0.76 only.

As the pulse crops are of short duration (80-100 days), 2-3 crops can be raised per year in the interspaces of coconut resulting in significant additional income. Besides, growing pulses also results in soil enrichment by fixation of nitrogen in root nodules, suppression of weeds and conservation of soil moisture by canopy cover.

The study reveals that cowpea is the most suited and remunerative intercrop in coconut plantations aged 40 years or above. Soybean and groundnut are the other crops suited for intercropping. Greengram recorded poor yield and net returns while blackgram recorded negative net returns and so are unsuited for intercropping. Thus it can be concluded that cowpea, soybean and greengram are the best suited intercrops in coconut gardens.

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Table 2 Growth and yield attributes of intercrops

Treatments	Plant height (cm)		No. of nodes/plant		Dry matter production (gm/plant)		No. of pods/plant	
	1989	1990	1989	1990	1989	1990	1989	1990
Soybean	51.8	51.8	8.3	8.5	4.0	3.5	22.6	29.8
Blackgram	29.0	27.8	5.0	5.5	2.0	1.8	6.1	5.5
Greengram	55.1	51.8	5.5	6.0	4.6	4.5	11.6	9.9
Cowpea	75.0	74.3	8.5	9.0	6.5	6.2	14.8	14.8
Groundnut	50.6	51.0	7.0	8.0	4.2	4.6	9.6	10.8
SEd	2.19	1.62	0.46	0.52	0.35	0.31	1.88	0.77
CD	4.37	3.20	0.92	1.04	0.70	0.62	3.75	1.54

Table 3 Yield and economics of different intercrops

Treatments	Yield (kg/ha)			Net returns			Benefit cost ratio		
	1989	1990	Mean	1989	1990	Mean	1989	1990	Mean
Soybean	720	666	693	1200	930	1065	1.50	1.39	1.45
Blackgram	250	200	225	-350	-700	-525	0.84	0.67	0.76
Greengram	375	330	353	525	210	368	1.25	1.10	1.18
Cowpea	800	850	825	2700	3000	2850	2.29	2.43	2.36
Groundnut	630	730	680	910	1610	1260	1.26	1.46	1.36
SEd	48.4	26.6		299.8	171.7		0.13	0.08	
CD	139.5	52.9		597.4	342.3		0.26	0.15	

ANNEXURE - 1

Crop	Cost of cultivation (Rs/ha)	Price of produce (Rs/kg)
Soybean	2400	5.00
Blackgram	2100	7.00
Greengram	2100	7.00
Cowpea	2100	6.00
Groundnut	3500	7.00