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PERFORMANCE OF SPICE CROP AS INTERCROPS IN COCONUT PLANTATION UNDER KONKAN CONDITION.

D.D. Nagawekar, A.G. Desai[1], G.D. Joshi[2], M.B. Magdum[3] and H.H. Khan[4]

Regional Coconut research Station, Bhatye,
Konkan Krishi Vidyapeeth, Dapoli

ABSTRACT

The spice crop viz nutmeg, cinnamon, clove and black pepper have been planted in coconut plantation as intercrops. After planting these intercrops the yield of coconut was found to increase between 24 to 94 per cent as compared to the previous year yield. Among these different spice inter crops the nutmeg exhibited the most promising performance. Nutmeg alone and nutmeg + coconut mixed crops recorded the maximum net returns of Rs. 10,350/- per ha. and Rs. 82,355/- per ha. respectively followed by cinnamon + coconut Rs. 62,475/- per ha. and Black pepper + coconut Rs. 39,898/- per ha. The coconut monocrop alone recorded nut return of 30,475/- per ha.

INTRODUCTION

Coconut is a crop of small and marginal farmers in India. The income obtained from such small holding is inadequate to sustain the dependent families and also the coconut sole crop does not provide an adequate employment to the family labourers Therefore growing annual and perennial crops in the inter spaces of coconut not only increase the additional income per unit area but also provide the sufficient work to the family labourers. of coconut grower.

A number of perennials like cocoa, clove, nutmeg, pepper, jack, bread fruit, mango and timber yielding trees are often raised as mixed crops in coconut plantation. However, productivity of such system is low due to improper selection of companion crops and adoption of unscientific management practices. Therefore, the current investigation was under taken with a view to decide the best suitable inter and mixed crop combination for coconut under the Konkan region of Maharashtra State, so as to obtain maximum returns per unit area.

MATERIALS AND METHODS.

The experiment was conducted at the Regional Coconut Research Station, Bhatye, Ratnagiri (Maharashtra) during 1979 to 1998. The Spice crops *viz.* nutmeg, cinnamon, clove, and black pepper have been planted as interecrops in coconut plantation from 1979 to 1987. The coconut palms are planted at a distance of 7.5 X 7.5 m in coastal sandy soils in 1956. Cinnamon block includes cinnamon. Four cinnamon seedings were planted in between two coconut palms & single raw of cinnamon seedlings planted in between two coconut row. In the year 1987, these cinnamon seedlings were replaced by cinnamon layers. In clove and nutmeg blocks clove and nutmeg seedlings were planted in between two coconut palms during 1979 separately. Black pepper block includes only black pepper vines trained on glyricidia. Two glyricidia stumps were planted in between two coconut palms and two rows of glyricidia stumps were planted in between two rows of coconut palms during 1986. Rooted pepper cuttings were planted near stumps during 1987.

The control block has been kept clear and no inter crops were grown in this block. The yield data of each spice crop was recorded after it started yielding the gross returns in Rs. per ha. for each inter crops as well as intercrops + coconut palms were worked out by considering the prevailing wholesale rates in the local market of Ratnagiri (M.S.). The cost of cultivation was estimated by considering actual inputs cost required for each crop.

1. Professor Department of Horticulture
2. The Head, Department of Horticulture
3. Ex. Director of Research K.K.V., Dapoli
4. Project Co-ordinator(Palms), CPCRI, Kasargod, Kerla, India

Table 1. Average yield of coconut per palm per year in different blocks of spice crops for the year 1998-99 (No. of nuts).

Sr. No.	Name of the Block Particular	Cinnamon Block	Clove Block	Nutmeg Block	Black pepper Block	Control Block
1.	Average yield before planting spice crops	69.25	47.08	70.56	82.87	75.78
2.	Average yield after planting psice Average crops(1982to1999)	122.16	90.97	121.52	102.42	Average yield of 21 years
3.	Percent increase	74.86	93.93	75.80	23.59	

RESULTS AND DISCUSSION

The data regarding coconut yield presented in Table 1 recorded that the yield of coconut gradually increased in all the blocks after planting the intercorps. As compared to the average yield of first four years the average yield per palm per year increased between 24 to 94 per cent after planting the intercrops. However, the average yield per palm in the control block is more or less the some every year. Nelliat *et al.* (1974) reported that the mean yield of coconut was increased by 33 per cent under west coast condition by mix farming. Similar increased in nut yield of coconut has been reported by Sahasranaman *et al.* (1983) in root (wilt) affected garden when mixed farming was adopted.

The increase in the yield of coconut must be mostly due to frequent irrigation and intensive cultivation. The palms which were being irrigated once in a week before planting the mixed crops are benefited by the additional water and fertilizers given to the mixed crops. The moist soil condition, biomass decomposition and the microclimate might have helped the activities of beneficial soil micro organisms. The data regarding the economics of different spice crops and coconut palms are presented in Table 2 for the year 1997-98. It can be seen from the data that the nutmeg recorded the maximum yield i.e. 36955 nuts and 10 kg. mace per ha. where as clove recorded 37.5 kg. clove buds/ha black pepper yielded 53.250 kg/ha and the yield of cinnamon was 50 kg. /ha.

Table 2. Yield and economic aspects of spice crops grown as intercrops in coconut. (1999-98).

Sr. No.	Treatements	Yield/ha		Receipts (Rs./ha.)		Cost of cultivation (Rs./ha)			Net profits (Rs./ha.)		
	Mainp Crop nuts	inter Crop	Main Crop	Inter Crop	Total	Main Crop	Inter Crop	Total	Main Crop	Inter Crop	Total
1.	Coconut+ nutmeg	21710	36955 nuts 10 kg mace	108550	30715	139265	16625	20285	56910	71925	+10430	82355
2.	Coconut+ Cinnamon	21490	50kg	107450	7500	144950	36625	15850	52475	70825	-8360	62475
3.	Coconut Blackpepper	18135	53.250kg	90675	3732	94402	36625	18380	55005	54050	-14652	39398
4.	Coconut+ Clove	15940	37.5 kg.	79700	12375	92075	36625	17285	53910	43075	-4910	38165
5.	Coconut alone	13420	-	67100	-	67100	36625	-	36625	30475	-	30475

Table 3. Average net profit/ha. of coconut based high density multipsices cropping system for 4 years.

Sr. No.	Treatment	Average net profit/ha over 4 years (1994-95 to 1997-98)	% increase over control
1.	C + Nutmeg	69,593/-	177%
2.	C+ Cinnamon	50,807/-	103%
3.	C + Clove	36,308/-	45%
4.	C + Black pepper	34,240/-	37%
5.	Coconut alone	22,081/-	-

The total returns per ha from different spices block was Rs. 92,075/- to 1,39,265/-. The maximum total returns per ha was obtained in coconut + nutmeg block (Rs. 1,39,265/-) followed by coconut + cinnamon (Rs.1,14,950 /- ha, coconut + Black pepper (94, 402/- ha) and coconut + clove blocks (Rs. 92075/-ha). All the block recorded higher net profit than sole crop of coconut. Block with nutmeg recorded the highest net profits at Rs. 82,355/- per ha followed by cinnamon block Rs. 62,475/- per ha, Black pepper block Rs. 39,398/- per ha and clove block Rs. 38165/- per ha. The monocrop of coconut gave a nut profit of Rs. 30,475/- per ha. However, the nutmeg alone recorded net returns of Rs. 10,430/ - per ha.

The data regarding average net profit for last four years (1994-95 to 1997-98) and percentage increase over monocrop presented in Table 3 revealed that the maximum net profit was obtained in coconut + nutmeg block (Rs. 69,593/ -ha) followed by coconut + cinnamon block (Rs. 50,807/- ha), coconut + clove (Rs. 36,308/- ha) and coconut + Black pepper (Rs. 34,240/-ha). Where as percentage increased over control (Monocrop) was maximum in C + nutmeg block (177%) followed by C + Cinnamon (103%), C + clove (45%) and C + Black pepper (37 %).

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