

INDIA is the largest arecanut producing country in the world accounting for 75 per cent of the world's production and employing nearly four million persons in the production, processing and marketing of arecanut. In India it is mainly grown in the southern states and partly in Assam and in some parts of West Bengal. In West Bengal it is mainly grown in two districts, namely, Cooch Behar and Jalpaiguri

the income of the arecanut growers without adversely affecting its production. In some areas, farmers are reluctant to take up intercropping since there is a widespread belief that the intercrop will affect the yield of the main crop adversely. A number of field experiments were initiated in the early sixties at the Central Plantation Crops Research Institute, Regional Station, Vittal, and its Research Centres located in



Banana in areca gardens in north Bengal

INTERCROPPING IN ARECA GARDENS IN NORTH BENGAL

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which come under North Bengal region. West Bengal, with an area of about 3100 hectares under arecanut, accounts for about 1.4 per cent of the total cultivated area under arecanut in the country.

Arecanut is a perennial crop with sufficient solar radiation penetrating through its course and provides considerable scope for intercrops which can supplement

various arecanut growing regions like Peechi (Kerala), Hirehalli (Karnataka), Palode (Kerala), Kahikuchi (Assam) and Mohitnagar (West Bengal) to assess the advantages or disadvantages of intercropping. The productivity and economics of intercrops has also been studied. Experiments with various annual crops like pepper, cacao and betel vine in arecanut gardens have

shown that growing these crops had no adverse effect on the performance of areca; on the contrary in most cases the mean yield per palm in mixed crop plots (areca+intercrop) was higher than in monocrop showing complementary relationship. Thus, the farmers, especially of backward region of North Bengal, must be convinced and encouraged for adopting intercropping in their existing areca gardens.

North Bengal has a considerable potential for introducing intercropping or multistorey cropping. At present the research and cultivation of these crops are largely confined to southern tropical region of the country which has caused regional imbalance also. However, the concept of intercropping or multistorey cropping is not practised in the North Bengal region mainly because of poor economic condition of areca growers and lack of knowledge of scientific methods of cultivation.

Arecanut occupies an important place in the rural economy of North Bengal because of its large-scale

a vast scope for extending intercropping in existing gardens in this region.

Further, the above study revealed that all the five intercrops are grown traditionally in the region and are not being replaced by comparatively more profitable intercrops such as black pepper, elephant yam, arrow root, cinnamon, etc. Although five crops were commonly grown as intercrops or mixed crops in areca garden, it was not a common practice either to grow more than one crop in the same unit area or to grow all these intercrops by every farmer. It is evident from Table 1 that even those who grow intercrops in the garden did not grow them in the whole of the area covered by the garden but only a part of the garden. This is mainly due to lack of modern technical know-how and also because of the limitations of irrigation and other inputs including planting materials. There is a great demand for rooted cuttings of the high yielding hybrid pepper 'Panniyur-1' in the region.

A feasibility trial is in progress at the CPCRI Re-

TABLE 1. ARECANUT AND INTERCROPS
(Area in hectares)

Sl. No.	Size Group	Arecanut	Pineapple	Bannana	Ginger	Turmeric	Betelvine	Total area without intercrops	Area without intercrops
1.	Small	0.22	0.0003 (1.60)	0.02 (7.58)	0.0002 (1.16)	0.0005 (2.32)	0.02 (6.68)	(0.05)	0.07 (80.66)
2.	Medium	0.36	0.01 (2.36)	0.02 (4.86)	0.004 (1.44)	0.006 (1.69)	0.02 (5.23)	0.06 (15.58)	0.03 (84.42)
3.	Large	0.69	0.008 (1.37)	0.02 (3.27)	0.01 (1.56)	0.002 (0.60)	0.04 (5.57)	0.08 (12.37)	0.61 (87.63)
4.	All farms	0.45	0.009 (1.68)	0.02 (4.29)	0.006 (1.47)	0.005 (1.13)	0.35 (5.62)	0.07 (14.19)	0.38 (85.81)

Figures in parentheses indicate the percentage of the total area under arecanut

domestic uses. In spite of this, efficiency of arecanut production and marketing in the region is still low. A sample survey study was made by the CPCRI, Research Centre, Mohitnagar (1978-81) of Jalpaiguri district to analyse the economics of arecanut and cultivation of intercrops and to estimate the area available for extending intercropping in existing arecanut garden. It was found that arecanut cultivation is profitable in the region. Regarding intercrops pineapple, banana, turmeric, ginger and betelvine were common intercrops. Except betelvine none of the intercrops is profitable. Data presented in Table 1 reveal that among the intercrops betelvine occupied maximum proportion of the total area under arecanut (5.62 per cent) followed by banana (4.29 per cent), and pineapple (1.68 per cent). It is further observed that all the five intercrops together accounted for only 14.19 per cent while 85.81 per cent of the area was without any intercrop. Thus there is

search Centre, Mohitnagar, Jalpaiguri on intercrops with a view to selecting suitable intercrops for this region and also to determine their suitability in multi-storey cropping system in areca garden. The multi-storey cropping system is a new agronomic practice for this region although it is very popular in the southern states. In this system the optimum use of land, water, solar energy and nutrients can be made by using both the horizontal and vertical space available. In this system crops having different stature and rooting pattern may be selected from compatible combinations. The results of the above trial so far obtained have been given in Tables 2 and 3. The trial has given very encouraging results although it is still in primary stage of observation. It can be observed from the data presented in Table 2 that among various crop combinations with arecanut, elephant yam+black pepper registered highest net profit per hectare followed by arrowroot+pepper, betelvine, pepper, pineapple and banana.

TABLE 2. ECONOMICS OF INTERCROPS IN ARECANUT GARDEN

Sl. No. Arecanut and Intercrops	(Rs per hectare)						
	Gross return from arecanut	Cost of cultivation of arecanut	Gross return from intercrops	Cost of cultivation of intercrops	Joint returns	Joint cost	Joint net profit
1. Arecanut (Control)	22,444	7,673	—	—	—	—	14,771
2. Arecanut + ginger	23,949	7,673	2,486	4,519	26,435	12,192	14,243 (- 3.57)
3. Arecanut + banana	22,050	7,673	6,350	3,500	28,400	11,113	14,287 (+ 17.04)
4. Arecanut + pineapple	21,558	7,673	3,202	2,465	24,760	10,138	14,622 (- 1.01)
5. Arecanut + betelvine	25,102	7,673	6,484	3,190	31,586	10,863	20,723 (+ 40.30)
6. Arecanut + pepper	21,800	7,673	8,864	2,360	30,664	10,003	20,631 (+ 39.67)
7. Arecanut + elephant foot yam + pepper	21,540	7,673	13,000	4,400	36,540	12,073	24,467 (65.64)
8. Arecanut + pepper + arrowroot	21,650	7,673	12,500	4,600	34,150	12,273	21,877 (+ 48.10)
9. Arecanut + pineapple + pepper	21,559	7,673	11,100	4,797	32,650	12,470	20,180 (+ 36.62)

NB: Figures in parentheses indicate per cent increase or decrease over control (mono-crop). Costs and returns have been computed on 1981 prices

The combination with pineapple and ginger actually incurred loss. The effect of intercrops on the yield of arecanut presented in Table 3 indicate the highest increase over control in the plot growing arecanut with pepper and arecanut with pepper + elephant yam (18.42 per cent) followed by arecanut + betelvine (14.99 per cent), arecanut + arrowroot + pepper (17.54 per cent) and arecanut + ginger (10.18 per cent). Intercrops of banana and pineapple actually indicate decline in the yield over the control plot, but this decline is marginal.

Multi-storey Cropping

One notable point of pepper yield is that it has produced 400 gms of dried berries per vine which is about 60 per cent above the country's average yield of 250 gms per vine though vines are only 6 years old. Thus it can be recommended safely to bring more area under pepper cultivation in existing arecanut garden in this region.

The foregoing analysis indicates that black pepper, arrowroot, elephant yam and betelvine are paying companion crops in arecanut gardens rather than the traditional intercrops like banana, ginger, turmeric and

TABLE 3. MEAN YIELD OF ARECANUT AND INTERCROPS

Sl. No.	Crop combination	Yield of arecanut per palm (numbers)	Yield of intercrops kg/ha
1.	Ginger	243 (+10.18)	829
2.	Banana	224 (-2.77)	3175
3.	Pineapple	219 (-6.00)	3202
4.	Betelvine	255 (+17.99)	648400 Nos.
5.	Pepper	270 (+18.42)	415*
6.	Elephant yam + pepper	270 (+18.42)	4500**
7.	Arrowroot + pepper	268 (+17.54)	430**
8.	Arecanut (control)	228	

*Yield of elephant yam and

**Arrowroot processed powder

NB: Figures in parentheses indicate per cent increase or decrease over control plot (arecanut without intercrop).

pineapple which are less profitable. Thus there is a need to shift the cropping pattern. Further, it is observed that about 85 per cent area in garden land is without any intercrop, therefore, there is an urgent need to utilise it by popularising intercropping system. The intercrops should be selected according to the suitability in the region keeping in view the soil fertility, irrigation water and marketing facilities.

READ

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