

INTERCROPPING IN RAINFED BANANA, *MUSA* (AAB) 'PALAYANKODAN'

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In recent years emphasis is given to higher income from unit area by raising intercrops along with main crop or by high density planting. Intercropping in banana is practised to a limited extent by farmers in the irrigated crop. Intercropping possibilities in rainfed banana is seldom exploited and so far no systematic information is available. An experiment was therefore laid out at the College of Horticulture, Vellanikkara, Kerala to find out the most profitable rainfed banana based cropping pattern under Kerala conditions and to find out the most economic intercrop along with rainfed banana.

Materials and Methods

'Palayankodan', a popular cultivar of banana of Kerala, mainly grown as a rainfed crop was selected for the study. The suckers were planted at the month of January. Pot watering at the rate of 9 l/plant was done at fortnightly intervals as life irrigation from the first week of planting till three months for the establishment of suckers. Cowpea, turmeric, ginger, tapioca, colocasia, yam and dioscorea were grown as intercrops. The intercrops were planted at the month of May 1982 and 1983. Each of the intercrop received the respective cultural and manurial practices as per the package of practices recommendation of the Kerala Agricultural University (Anon., 1982). Uniform practices of cultural and crop management were adopted during the cropping period. The experiment was laid out in a randomised block design with three replications. The experiment was conducted for two years during 1982 and 1983. In each plot there were 16 plants. For recording morphological characters four plants were selected.

Observations on various morphological characters viz., height, number of functional leaves, length of petiole, and leaf area were recorded at the time of shooting. Similarly the bunch characters were also recorded at the time of harvest. The yields of intercrops were recorded at their harvest and economics of intercropping was also worked out. The data were statistically analysed.

Results and Discussions

The results of different aspects of investigations are presented in Tables 1 and 2.

The results showed that intercropping did not cause any yield reduction in banana, although intercropping did not have any favourable effect on the yield of

banana. However, cost of cultivation of banana decreased in intercropped treatments since intercropping suppressed weed growth. Similar reduction in the cost of cultivation of banana in intercropped treatments was also reported by Chundawat *et al.* (1984). The yield of banana is a combined effect of factors like number of hands, number of fingers, girth and weight of fingers (Simmonds, 1959; Venkatesam *et al.*, 1965 and Arunachalam *et al.* 1976). In the present study none of these

Table 1

Rainfall during the cropping period (from January 1982 to January 1984)

| Period | Total rainfall (mm) | Number of rainy days per month |
|-------------|---------------------|--------------------------------|
| <i>1982</i> | | |
| January | Nil | Nil |
| February | Nil | Nil |
| March | Nil | Nil |
| April | 61.4 | 4 |
| May | 173.1 | 7 |
| June | 715.0 | 23 |
| July | 600.9 | 24 |
| August | 566.4 | 24 |
| September | 67.4 | 5 |
| October | 277.8 | 12 |
| November | 98.4 | 6 |
| December | 5.2 | 1 |
| <i>1983</i> | | |
| January | Nil | Nil |
| February | Nil | Nil |
| March | Nil | Nil |
| April | Nil | Nil |
| May | 37.4 | 3 |
| June | 387.2 | 19 |
| July | 580.6 | 21 |
| August | 754.7 | 26 |
| September | 494.6 | 24 |
| October | 149.8 | 7 |
| November | 60.2 | 3 |
| December | 24.4 | 3 |
| <i>1984</i> | | |
| January | Nil | Nil |

Table 2
Effect of intercrops on growth characteristics of banana
(var. Palayankodan)

| Sl. No. | Treatment | Height cm | Girth cm | No. of leaves | Leaf area m ² | Length of petiole, cm |
|---------|--------------------|-----------|----------|---------------|--------------------------|-----------------------|
| 1 | Banana | 271.83 | 61.88 | 9.29 | 9.86 | 51.75 |
| 2 | Banana+cowpea | 264.78 | 62.70 | 8.85 | 11.34 | 51.50 |
| 3 | Banana + turmeric | 291.68 | 63.46 | 9.78 | 12.86 | 56.51 |
| 4 | Banana + ginger | 277.33 | 63.00 | 9.28 | 12.79 | 52.75 |
| 5 | Banana + tapioca | 269.07 | 62.10 | 8.92 | 11.83 | 52.22 |
| 6 | Banana+yam | 276.33 | 63.78 | 8.88 | 11.92 | 55.36 |
| 7 | Banana + colocasia | 272.46 | 63.70 | 8.57 | 10.85 | 51.68 |
| 8 | Banana+dioscorea | 266.42 | 61.13 | 8.83 | 11.92 | 51.83 |
| | CD (0.05) | NS | NS | NS | NS | NS |
| | SE | 26.12 | 2.34 | 0.94 | 3.44 | 4.34 |

Table 3
Effect of intercrop on fruiting characters of banana var. Palayankodan

| Sl. No. | Treatment | Weight of bunch kg | Length of bunch cm | No. of fingers | No. of hand | Weight of finger g |
|---------|--------------------|--------------------|--------------------|----------------|-------------|--------------------|
| 1 | Banana | 8.96 | 59.43 | 197.81 | 12.18 | 47.11 |
| 2 | Banana+cowpea | 8.18 | 50.98 | 184.92 | 12.17 | 45.95 |
| 3 | Banana+turmeric | 9.02 | 56.61 | 199.83 | 12.33 | 51.25 |
| 4 | Banana + ginger | 9.10 | 59.16 | 206.12 | 12.50 | 47.23 |
| 5 | Banana+tapioca | 8.11 | 56.40 | 199.28 | 12.28 | 44.91 |
| 6 | Banana+yam | 8.21 | 60.35 | 194.62 | 11.91 | 40.95 |
| 7 | Banana+colocasia | 8.74 | 53.61 | 194.56 | 12.26 | 45.88 |
| 8 | Banana + dioscorea | 8.71 | 58.88 | 154.35 | 11.49 | 50.70 |
| | CD (0.05) | NS | NS | NS | NS | NS |
| | SE | 1.07 | 6.29 | 39.67 | 0.94 | 6.6 |

Table 4
Economics of intercropping in banana var. Palayankodan (rainfed)

| Treatments | Yield of banana kg | Return from banana Rs | Cost of cultivation of banana Rs | Net return Rs | Yield of inter-crops kg | Return from inter-crops Rs | Additional cost Rs | Net return from inter-crops Rs | Total net return Rs | Incremental benefit or loss Rs | Benefit cost ratio |
|--------------------|--------------------|-----------------------|----------------------------------|---------------|-------------------------|----------------------------|--------------------|--------------------------------|---------------------|--------------------------------|--------------------|
| Banana | 19264 | 24080 | 15736 | 8344 | — | — | — | — | 8344 | — | 1.53 |
| Banana + cowpea | 17630 | 22038 | 14486 | 7552 | 333 | 666 | 1025 | - 359 | 7193 | -1151 | 1.46 |
| Banana + turmeric | 19393 | 24242 | „ | 9755 | 2003 | 6008 | 5068 | + 940 | 10695 | + 2351 | 1.55 |
| Banana + ginger | 19565 | 24456 | „ | 9970 | 1310 | 5239 | 6031 | — 792 | 9178 | + 834 | 1.45 |
| Banana + tapioca | 17436 | 21795 | „ | 7309 | 2400 | 2400 | 2740 | — 340 | 6959 | -1375 | 1.40 |
| Banana + colocasia | 17651 | 22064 | „ | 7578 | 1980 | 3960 | 4110 | — 150 | 7428 | — 916 | 1.40 |
| Banana + yam | 18812 | 23515 | „ | 9029 | 3277 | 6555 | 5479 | + 1076 | 10105 | + 1766 | 1.51 |
| Banana + dioscorea | 18726 | 23408 | „ | 8922 | 2744 | 4115 | 3836 | + 279 | 9201 | + 857 | 1.50 |

Cost of inputs and produces, Rs/kg: Ginger 4.0; tapioca 1.0; coiocasia 2.0; yam 2.0; banana 2.0; turmeric 3; dioscorea 1.50; ammonium sulphate 2.0; superphosphate 1.0; muriate of potash 1.50; labour/unit 22.0

factors was altered by intercropping. In banana, it is well established that the vigour during vegetative phase has a direct relationship to the yield (Summerville, 1944). In the present study the vegetative parameters were not influenced by the intercrops and hence the fruiting characters were also less likely to be influenced.

Devos and Wilson (1978), Chundawat *et al.* (1984) found no yield reduction or delay in harvesting by intercropping in banana.

The total income/ha was higher when banana was intercropped with turmeric (Rs. 10695.5) followed by banana intercropped with yam. The maximum benefit/cost ratio was 1.55 for banana intercropped with turmeric. The highest yield of intercrop in terms of rupees was obtained from yam. However, the yield of tapioca, ginger, colocasia and cowpea did not commensurate with the extra cost of fertilizers planting materials etc. Devos and Wilson (1979) and Chundawat *et al.* (1984) reported that none of the intercrops depressed tee vegetative growth and yield of banana but yields of intercrops like cassava, mango, turmeric and yam were not sufficiently high to compensate the extra cost on the fertilizers, planting materials and for the extra labour requirement.

Summary

None of the intercrops reduced the vegetative growth and yield of banana. However, the returns from intercrops like cowpea, ginger, colocasia and tapioca were not sufficiently high to compensate for the extra cost on the fertilizers and planting materials. The result suggested that intercropping of banana with turmeric or yam would prove profitable to the banana growers of Kerala under rainfed conditions.

References

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