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# Feasibility assessment of bitter gourd (*Momordica charantia*) as intercrop in coconut (*Cocos nucifera*) garden

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**Abstract**

The experiment was executed at Regional Coconut Research Station, Bhatye, Ratnagiri in the *rabi* season of 2022-23 to assess the performance bitter gourd grown as intercrop in coconut garden. The coconut garden of 30 years (Variety West Coast Tall) was selected for the experimentation and two blocks were prepared with and without bitter gourd intercrop. The net return from coconut garden was higher (₹ 1.744 per Rs.) due to intercropping with bitter gourd. The average profit and the additional intercropping income (33.92 per cent) was noted in Coconut + Bitter gourd system. Whereas in comparison with the sole crop, 106.30 man days/ha/year additional employment was generated in bitter gourd intercropping system.

**Keywords:** Coconut, bitter gourd, intercrop, employment

## Introduction

Among the different plantation crops, coconut is a foremost crop which is grown in coastal states of India and has great importance in economy of India. In Maharashtra state, Konkan region (Coastal belt) is a leading area of coconut cultivation owing to favorable soil and climate. Traditionally coconut is grown in diverse but distinctive farming systems which is providing livelihood to millions of the region.

Studies have revealed that sole crop of coconut with a spacing of 7.5m x 7.5m effectively uses only 22.3 per cent of land area (Durieux,1997) [2], while the average air space utilization by the canopy is about 30 per cent and solar radiation interception is about 50 per cent (Thiruvarassan *et al*., 2014) [6]. Adoption of coconut based intercropping system is one of the ways to utilize the natural resources effectively. Various region specific intercrops like food crops, vegetables, fodder crops, spices, flower crops, etc have been recommended as intercrops coconut garden. Among the vegetables, solanaceous crops, cucurbits can profitably grown as intercrops in coconut. Growing of cucurbitaceous crop like cucumber, ridge gourd and snake gourd were the suitable intercrops in coconut gardens (Nair *et al*., 2000) [3]. The bitter gourd (*Momordica charantia*) is an imperative crop among cucurbitaceous group from medicinal properties and has demand in market. Hence, the present study was undertaken to assess the feasibility of bitter gourd intercropping in coconut garden.

## Materials and Methods

The experiment was conducted at Regional Coconut Research Station, Bhatye, Ratnagiri in the *rabi* season of 2022-23. The block comprising 35 palms of 30 years old coconut (Variety West Coast Tall) was selected. The bitter gourd (Variety Konkna Tara) was grown as intercrop in two rows at 2.5 m distance from palm and 1.0 m distance was kept between two successive hills and consequently 12 vines were grown in the space of four palms. For comparison, a block of 35 palms of same age and variety was maintained as sole crop to assess the performance of the systems. The recommended cultural practices were followed in both blocks. The observations on yield of coconut and bitter gourd were recorded. Average income and average profit were calculated in different cropping systems. The average profit was expressed as a percentage of the average cost in different cropping system. As well as the additional intercropping income was calculated and expressed as a percentage of the monocropping profit by using following equation (Perera, 2017) [5].

{[Average profit of Intercropping (API) − Average profit of monocroping (APM)]/ Average profit of monocroping (APM} *100

## Results and Discussion

The data related to the average expenditure and average income in different systems is presented in Table 1. It is revealed that the net return from coconut garden was higher (₹ 1.744 per Rs.) due to intercropping with bitter gourd. The cost of production was higher in intercropping system as the more expenses was incurred in tillage, sowing, trailing and other management practices in bitter gourd intercrop. However, the remunerative yield was obtained from this system. Similar trend was also noted by Perera (2017) [5] who stated that the profitability of the coconut land can be increased by adding of one or more intercrops under coconut.

The variation in Average Profit, Average Rate of Return and employment gneration in cropping system depicted in Table 2 revealed that the average profit and the additional intercropping income (33.92 per cent) was noted in Coconut + Bitter gourd system. Whereas in comparison with the sole crop, 106.30 man days/ha/year additional employment was generated in bitter gourd intercropping system. The increased economic return in the intercropping systems of coconut with medicinal and aromatic plants was also reported by Basavaraju *et al*. (2011) [1]. It is well accepted that inter cropping system under coconut is more profitable than mono cropping which promises to the farmers a lot besides generating additional employment opportunity (Nath, 2002) [4].

**Table 1:** Expenditure and Income from Coconut Intercropping System

| System | Average Expenditure (Rs/ha/year) | Average Income (Rs/ha/year) | Net profit (Rs/ha/year) | Net returns/Rs. |
|---|---|---|---|---|
| Coconut + Bitter gourd | 2.16.515/- | 3,77,645/- | 1,61,130/- | 1.744 |
| Coconut Sole crop | 1,84,600/- | 3,04,920/- | 1,20,320/- | 1.651 |

**Table 2:** Variation of Average Profit, Average Rate of Return and employment gneration in cropping system

| System | [(Average profit/Average cost)*100] | Additional intercropping income (%) | Additional employment generation (No. man days/ha./year) |
|---|---|---|---|
| Coconut + Bitter gourd | 74.42 | 33.92 | 106.30 |
| Coconut Sole crop | 65.18 | - | - |

## Conclusion

From the present study, it is concluded that the bitter gourd is a feasible intercrop in coconut garden.

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