

Kacholam (*Kaempferia galanga* L.) - A Potential Medicinal-cum-Aromatic Crop for Coconut Gardens

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Abstract

An observatory trial was conducted to study the performance of kacholam as an intercrop in coconut garden and also in a open area at CPCRI, Kasaragod. The results revealed that, the growth, yield components and yield were superior when kacholam crop was grown under coconut garden compared to open area. The oil and oleoresin contents were also higher under coconut garden compared to the crop grown in open space.

Introduction

Kacholam is an important medicinal-cum-aromatic herbaceous stemless plant belonging to *Zingiberaceae* family. The rhizomes are the economic part, and are used in ayurvedic medicine as stimulant, diuretic, stomachic, carminative and also used as flavouring agent, etc. The active ingredient or rhizome is an essential oil, which finds use in perfumery and curry flavourings. In addition to essential oil, its rhizomes

yields oleoresin. Oleoresin is the total flavour extract comprising of essential oil, non-essential oil, pungent principles, colours and fats.

The scope for increasing the land area under cultivation being negligible, intensive cultivation of crops and raising the productivity per unit area is the only means of increasing food production. In the case of coconut which remains committed to the land for decades with long gestation period, it is advisable to practice inter/mixed cropping for getting additional and staggered income. Studies on land and solar energy utilization in coconut garden revealed the amenability of the palm in intensive cropping to harness the unutilised space, solar energy and other resources. The strategy for intensive multiple cropping is to have parallel combinations of crops in such a way that other crops of less duration are planted in the interspaces without altering the planting pattern or intensity of the coconut. Studies conducted at the Central Plantation Crops Research Institute and elsewhere has proved the suitability and economic viability of growing various inter and mixed crops in coconut garden. Keeping in view the above factors, an observatory trial was carried out at CPCRI, Kasaragod to study the performance of kacholam in coconut garden and in open space.

Materials and Methods

An observatory trial was undertaken to study the perfor-

mance of kacholam in a sandy loam soil with 30 year old coconut garden, having the spacing of 7.5 m apart and in open space during 1995-96 and 1996-97. In both the situation, the crop was established by adopting the package of 20x15 cm spacing, FYM 20 tonnes per hectare and NPK 50:50:50 kg per hectare. The FYM was applied 21 days before planting kacholam. The 50 percent of NPK was applied 45 DAP and remaining 50 per cent NPK was applied 90 DAP, in the form of urea, mussooriephos and muriate of potash, by opening a small furrow between the rows. The rhizomes were soaked in Dithane-M-45 (0.3% solution) for 30 minutes and planted. The growth characters like number of tillers, number of leaves and leaf area were recorded from representative plants. At harvest the number of rhizomes and fresh weight of rhizomes were recorded.

Chlorophyll and carotenoid estimation was carried out using the standard procedure (Arnon, 1949). The oil and oleoresin content were estimated by following the procedure given by AOAC (AOAC, 1965).

Results and Discussion

Growth and Yield components

Mean of two years data on growth and yield components were higher when the crop was grown as an intercrop in coconut garden compared to the crop grown in open space (Table 1). This depicts the nature of adaptability of kacholam crop to shade condition, wherein under partial

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Table 1. Comparative performance of Kacholam under open space and as intercrop in coconut garden*

	No of tillers plant ⁻¹ (120 DAP)	No of leaves plant ⁻¹ (120 DAP)	leaf area (cm ² plant ⁻¹) (120 DAP)	Chl "a" (mg g ⁻¹ fresh leaf) (150DAP)	Chl. "b" (mg g ⁻¹ fresh leaf (150DAP)	Carotenoid (mg g ⁻¹ fresh leaf (150DAP)
Open space	3.0	7.0	275.5	0.403	0.184	0.039
Intercrop	3.5	8.5	310.2	0.704	0.278	0.064

*Pooled data

shade condition its growth was better. Further, the chlorophyll 'a', 'b' and carotenoid contents were higher in intercropped crop compared to open space. Similar higher growth components like more number of foliage, and dry weight of cocoyam crop have been reported when it was grown under shade compared to 100 per cent sun grown plants (Valenzuela, 1990). Further he reported that, shade grown plants had higher LAI, CGR, NAR and chlorophyll content than sun grown plants.

Yield

Yield of kacholam obtained as intercrop was higher (6.1 t ha⁻¹) compared to open space grown crop (4.8 t ha⁻¹). The increase in the yield as intercrop was to the extent of 21.4 per cent compared to open space. Nair *et al.* (1991) reported the almost similar yield of kacholam when grown as an intercrop in coconut garden and in open space. Higher growth and yield components of ginger when grown as an intercrop in areca garden compared to open space has been reported by Muralidharan (1980).

Qualitative Characters

The oil and oleoresin contents were higher in intercrop grown crop (2.0 and 3.8 per cent, respectively) compared to open space (1.6 and 3.1percent, respectively). This is mainly because of better growth, yield components as reflected in more number of leaves, higher leaf area, chlorophyll 'a', 'b' and carotenoid contents (Table 2). In turmeric, Satheesan and Ramadasan (1988) also reported the higher curcumin content when it was grown as an intercrop in coconut compared to open space. In ginger, Babu and Jayachandran (1994) reported the 16.5 per cent higher volatile oil content when the crop was grown in heavy shade than that of open space and also there was significant decrease in the fibre content with increase in the shade levels. From this study it can be concluded that, there is ample scope for introducing kacholam as an intercrop in coconut gardens which finds use in ayurvedic medicines.

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*Original not seen

Table 2. Comparative performance of Kacholam under open space and as intercrop in coconut garden*

	Total DMP (g plant ⁻¹) (At harvest)	No. of rhizomes plant ⁻¹	Fresh rhizome yield (t ha ⁻¹)	Oil(%)	Oleoresin (%)
Open space	11.3	7.1	4.8	1.6	3.10
Intercrop	114.1	9.2	6.1	2.00	3.85

Data not statistically analysed
*Pooled data