

Turmeric + Chilli Intercropping: Way towards Doubling Farmers Income

Parashuram M Patil¹, D C Chougala², Adarsh H S³

¹Scientist (Horticulture), ICAR-BIRDS Krishi Vigyan Kendra, Tukkanatti, Belagavi-1, Karnataka (591 224), India
Corresponding email: [parashurammpatil1617\[at\]gmail.com](mailto:parashurammpatil1617[at]gmail.com)

²Scientist/SS&H (Plant protection), ICAR-BIRDS Krishi Vigyan Kendra, Tukkanatti, Belagavi-1, Karnataka (591 224), India

³Scientist (Fisheries), ICAR-BIRDS Krishi Vigyan Kendra, Tukkanatti, Belagavi-1, Karnataka (591 224), India

Abstract: A field experiment was undertaken during 2020-21 to check out the compatibility of turmeric with chilli as intercrop (T_3) compared to sole crop (T_1) and turmeric intercrop with fodder maize (T_2). A Frontline Demonstration was laid out at Itanal village of Raibag taluka farmer's field with objective of utilizing available nutrients, duration and space between the beds. Turmeric + chilli intercrop (T_3) is on par with sole cropping of turmeric in growth attributes like number of tiller per clumps (5.5 and 5.4) and total dry yield (48.2 and 48.1 q/ha) respectively. The highest significant additional income was observed in Turmeric + chilli intercrop (T_3) was Rs. 1,48,150 /ha (58%), increased CEY 70.2 q/ha (45.7%), maximum B:C ratio (1:2.75) and turmeric with intercrop fodder maize (T_2) reduce income (-6%) and crop equivalent yield (47.7 q/ha) with B:C ratio (1:2.26) in compared with sole crop turmeric yield (48.2 q/ha) with B:C ratio (1:2.42). Hence, turmeric + chilli intercrop with spacing of 120 cm between beds and 240 cm between plants in bed method cultivation of turmeric significantly increase the income without affecting the growth and yield of main crop turmeric.

Keywords: CEY, Intercrop, Sankeswar local, Turmeric + Chilli, Sole crop

1. Introduction

Turmeric (*Curcuma longa* L.), (Family: Zingiberaceae) the ancient spice of India which is known as 'Indian saffron,' and commonly called as Haldi is a commercially important spice crop grown in India. It is used as condiment, dye, flavouring agent in addition to use in religious ceremonies. It has anticancer and antiviral properties hence find the use in drug and cosmetic industries. India is the largest producer, consumer and exporter of turmeric in the world. The global production of turmeric is around 11 lakh tonnes per annum. India dominates the world production scenario contributing 80% followed by China (8%). In India during 2019-20, about 2.54 lakh ha (6 lakh acres) area was covered under turmeric. The important turmeric growing states in India are Telangana 55,443 ha (1, 37,000 acres), Odisha 27,864 ha (68,852 acres), Tamil Nadu 18,296 ha (45,209 acres), West Bengal 17,711 ha (43,764 acres), Karnataka 17,598 ha (43,895 acres), Assam 16,550 ha (40,895 acres), Maharashtra 14,511 ha (35,857 acres) and Andhra Pradesh 13,223 ha (32,674 acres) (AMIC PJTSAU- June 2020).

Turmeric in India occupies about six percent of the total area under spices and condiments. It is a long duration crop of 7 to 9 month and the initial growth of turmeric is rather slow and takes about 4-5 months to cover the interspace. Therefore, the available space between the rows/ bed of turmeric could be effectively utilized by growing short duration crops like, vegetables, cereals, etc. Hence, it is worthwhile to explore the possibilities of growing compatible crops with turmeric. Joyachandran et al. (1991) stated that highest yield of fresh turmeric was observed in intercropping system than sole crop due to shady condition. With this background, field experiment was formulated with objective of compatibility of intercrop chilli with turmeric, to study the effect of intercrops on growth and yield of

turmeric and determine the economics of turmeric based intercropping.

2. Materials and Methods

The field experiment was carried out as front line demonstration at Itanal village of Raibag Taluka in Northern Dry Zone of Belagavi district by ICAR-BIRDS Krishi Vigyan Kendra, Belagavi-1 during 2020-21. The experiment consist 10 farmers of which 1 acre of demo area for each farmer with total area of 10 acre. Intercropping with chilli (Turmeric + Chilli) as a technology demonstration and fodder maize (Turmeric + Fodder maize) as farmer practices. Title of the experiment was "Intercropping in Turmeric" turmeric variety salem, chilli variety sankeswar local and fodder maize private hybrid are considered. In this experiment 1389 seedlings of chilli variety sankeswar local are provided and planted with the spacing of 120 cm between the bed and 240 cm between the plant (4 ft. × 8 ft.) in bed method of turmeric cultivation 120 cm between bed denotes 90 cm bed with 30 cm passage at the one edge of the bed seedlings are planted. In this experiment parameters like main crop yield, intercrop yield, crop equivalent yield, intercrop yield per plant and its economics are calculated.

Treatment Details

T_1 - Sole cropping: Turmeric

T_2 - Farmer practices: Turmeric + Fodder maize

T_3 - Demonstration Technology: Turmeric + Chilli

3. Results and Discussion

The data on growth parameters of turmeric viz., number of tillers per clump, Fresh rhizome weight per plant (g), dry rhizome weight per plant (g), fresh yield (q/ha), Dry yield (q/ha), intercrop yield (q/ha) and crop equivalent yield (q/ha)

are presented in Table 1. Turmeric grown with intercrop chilli show statically on par with the sole crop turmeric in respect to growth and yield parameters it also agreed with

Chitra & Hemalatha (2017) Turmeric intercropped with cowpea recorded the maximum fresh rhizome yield (30.78 t/ha).

Table 1: Growth and yield attributes of the treatments

Treatments	No. of tillers/clump	Fresh Rhizome weight/ plant (g)	Dry Rhizome weight/ plant (g)	Fresh Yield (q/ha)	Dry yield (q/ha)	Intercrop yield (q/ha)	Crop equivalent yield (q/ha)
T ₁ : Solecrop Turmeric	5.5	1224	244.8	241.2	48.2	-	-
T ₂ : FP (Turmeric + Fodder maize)	4.6	1158	231.6	228.5	45.7	120	47.7
T ₃ : DT (Turmeric + Chilli)	5.4	1220	244.0	240.8	48.1	6.65	70.2

Economics of the each treatment are calculated and presented in the Table 2 based on the yield data and local market price for turmeric (Rs. 9,000.00 /q of dry turmeric), chilli (Rs. 300.00 /kg red chilli) and fodder maize (Rs. 1.5 /kg) are considered. Turmeric grown with intercrop chilli was significantly produces highest income (58%) and crop equivalent yield (70.2 q/ha) Similarly, M R Islam, et al. (2016) experiences that higher biomass production and more efficient use of land and available resources under intercropping with sesame than under sole cropping. Turmeric intercrop with fodder maize reduce income (-6%) and crop equivalent yield (47.7 q/ha) in compared with sole crop turmeric due to nutrients and moisture competence between the turmeric.

Table 2: Economics of the each treatment

Treatments	Gross return (Rs./ha)	Gross cost (Rs./ha)	Net returns (Rs./ha)	B:C ratio	Increased income /ha (%)
T ₁ : Sole crop Turmeric	4,33,800	1,78,850	2,54,950	2.42	-
T ₂ : FP (Turmeric + Fodder maize)	4,29,300	1,89,600	2,39,700	2.26	-6
T ₃ : DT (Turmeric + Chilli)	6,32,400	2,29,300	4,03,100	2.75	58

4. Conclusion

The growth, yield and economical of turmeric in treatments viz., Sole crop turmeric (T₁), Turmeric + Fodder maize (T₂)

and Turmeric + chilli (T₃) among these T₁ and T₃ are closely on par with growth attributes like number of tiller per clumps (5.5 and 5.4) and total dry yield (48.2 and 48.1 q/ha) respectively. The highest significant income was observed in T₃ was Rs. 1,48,150.00 /ha (58%) and CEY 70.2 q/ha (45.7%) in compared with the sole crop turmeric (T₁). Hence it is to concluded that turmeric + chilli intercrop with spacing of 120 cm between at one side of the beds and 240 cm between plants in bed method cultivation of turmeric significantly increase the income without affecting the growth and yield of main crop turmeric.

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Photographs





Figure 1: Sole cropping (T_1)



Figure 2: Turmeric + Fodder maize (T_2)



Figure 3: Turmeric + Chilli (T_3)