Research Article

Effect of nutrient management practices on growth and yield characters of coriander (*Coriander sativum* L) grown as an intercrop in the young coconut plantation in the lower gangetic plains region of West Bengal

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Abstract

Matured seeds of coriander (Variety Co-1) line sown in the first fortnight of November at an spacing of 22.5 cm x 15 cm in the interspaces of young coconut orchards under AICRP on palms at Horticulture Research Station, Mondouri, B.C.K.V, West Bengal, during 2016-17 and 2017-18. Among nutrient management practices, N2 (N2:25% RDN from organic manure+75%RDN from Chemical fertilizer) recorded significantly highest in terms of growth parameters like plant height, number of primary branches and dry matter at harvest and among nutrient management practices, N2 (N2:25% RDN from organic manure+75%RDN from Chemical fertilizer) recorded highest in terms of yield parameters like number of umbel per plant, number of umbelets per umbel, number of seeds per umbel and projected seed yield.

Keywords: coriander, umbel, nutrient, yield, growth

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Introduction

Studies revealed that natural resources i.e., soil, water, air space and solar radiation are not fully utilized under coconut spacing schedule 7.5 m x 7.5 m [1]. Therefore, excluding the active root zone of coconut which is confined to only twenty five per cent of the available land area, the subsidiary crops can be cultivated in the remaining area to enhance farm income from the same piece of land. A variety of crops can be grown in combination of coconut utilizing its underutilized solar radiation as well as soil space [2]. Coriander (Coriander sativum L), being short duration crops, is ready for harvesting within two to three months after sowing which results in higher income as well as intensive cropping [3]. Nutrient management assumes significance due to the fact that coconut requires continuous supply of nutrients throughout their life period for higher productivity [4].

Little work has so far been done about nutrient management of coriander as an intercrop in coconut plantation following cropping system approach for higher income generation. Hence, keeping in view of these points, the present investigations were formulated.

Materials and Methods

Field experiment was conducted in the plantation of All India Coordinated Research Project on Palms at the Horticulture Research Station (HRS), B.C.K.V., Mondouri, Nadia District, West Bengal during 2016 to 2018.

The experiment was laid out in a factorial RBD design with three replications. The seeds/seedlings of coriander (variety Co-1) planted as intercrop in coconut garden aged 8 years, planted at a spacing of 7.5 m x 7.5 m. For growing intercrops, plots were prepared by leaving 2 meters radius from the bole of the coconut and accordingly space was utilized to grow intercrops.

The space utilisation for different crops in a model was 25% for coconut palm, 40% for coriander crop during rabi season. The land was prepared by ploughing, disking and by passing cultivator to remove weeds and to crush the clods, which was followed by final harrowing to bring the soil to fine tilth. The experimental site was divided into small plots and leveling was done within each plot. Bunds of 60 cm width and 20 cm height were formed around each plot to avoid movement of water from one plot to another.

Treatments: Nutrient management practices

N_1 : 100% RDF for main crops and intercrops from Chemical fertilizer
N_2:25% RDN from organic manure+75%RDN from Chemical fertilizer
N_3:50% RDN from organic manure+50%RDN from Chemical fertilizer

100% RD of P and K will be supplied from chemical fertilizers in all.
Control: Coconut monocropping
Replications: Three

Seeds of coriander was line sown and gap filling, weeding, irrigation and interculture operations were done in the experimental plot as and when required to maintain the required plant population.

Observations on growth parameters were recorded on five randomly selected plants in crops at 30 days interval after sowing or planting of the crop and at harvest.

Results and Discussion

Growth parameters of coriander

The data on growth parameters like plant height, number of primary branches and dry weight at harvest are presented in **Tables 1** and **2**.

Table 1 Plant height of coriander as influenced by different nutrient management under CBCS

Treatment	Plant height (30DAS) (cm)			Plant height (60DAS) (cm)			Plant height (90DAS) (cm)		
	2016	2017	Pooled	2016	2017	Pooled	2016	2017	Pooled
N1	4.88	4.84	4.86	28.23	28.11	28.17	57.10	57.20	57.15
N2	4.86	4.90	4.88	28.47	28.55	28.51	58.13	58.07	58.10
N3	4.92	4.73	4.82	27.95	27.88	27.91	57.01	56.95	56.98
SEm (±)	0.11	0.05	0.06	0.27	0.19	0.16	0.12	0.24	0.13
C.D(P=0.05)	0.30	0.15	0.14	0.74	0.52	0.38	0.33	0.65	0.30

N1 : 100% RDF for main crops and intercrops from Chemical fertilizer
N2:25% RDN from organic manure+75%RDN from Chemical fertilizer
N3:50% RDN from organic manure+50%RDN from Chemical fertilizer

Table 2 Growth characters of coriander as influenced by different nutrient man- agement under CBCS

Treatment	Number of Primary branches			Dry matter at harvest (g)		
	2016	2017	Pooled	2016	2017	Pooled
N1	3.95	4.17	4.06	20.18	20.41	20.30
N2	4.80	4.70	4.75	21.16	20.92	21.04
N3	4.10	4.07	4.08	20.16	20.05	20.10
SEm (±)	0.39	0.20	0.22	0.26	0.26	0.19
C.D(P=0.05)	1.09	0.55	0.51	0.73	0.72	0.43

N1 : 100% RDF for main crops and intercrops from Chemical fertilizer
N2:25% RDN from organic manure+75%RDN from Chemical fertilizer
N3:50% RDN from organic manure+50%RDN from Chemical fertilizer

Plant Height (cm)

Plant height did not differ significantly for 30 days and 60 days after sowing due to the nutrient management practices at all the growth stages. Among nutrient manage- ment, N2 recorded significantly highest plant height (58.13) after 90 days of sowing.

Number of primary branches

Among nutrient management practices, N2 recorded highest number of branches (4.70) in rabi 2017 whereas N3 recorded lowest number of primary branches (4.07).

Dry matter at harvest

Among nutrient management practices, N2 recorded highest dry matter (21.16) in rabi 2016 whereas N3 recorded minimum dry matter (20.16).

Higher dry weight per plant under this treatment was mainly attributed to higher photosynthetic area as reflected by higher plant height and higher number of leaves. Simi- larly the combination of organic and inorganic fertilizers significantly increased the num- ber of leaves in cabbage [5, 6].

Yield parameters of coriander

The data on yield parameters like number of umbel, number of umbelets per umbel, number of seeds per umbel and projected seed yield (kg/ha) per plant at harvest are presented in **Tables 3** and **4**.

Table 3 Yield characters of coriander as influenced by different nutrient manage- ment practices under CBCS

Treatment	Number of umbel per plant			Number of umbelets per umbel		
	2016	**2017**	**Pooled**	**2016**	**2017**	**pooled**
N1	20.80	20.35	20.57	4.07	4.01	4.04
N2	21.76	21.71	21.73	4.87	4.72	4.79
N3	20.29	20.15	20.22	3.90	3.80	3.85
SEm (±)	**0.22**	**0.12**	**0.13**	**0.18**	**0.10**	**0.10**
C.D(P=0.05)	**0.61**	**0.34**	**0.29**	**0.51**	**0.27**	**0.24**

N1 : 100% RDF for main crops and intercrops from Chemical fertilizer
N2:25% RDN from organic manure+75%RDN from Chemical fertilizer
N3:50% RDN from organic manure+50%RDN from Chemical fertilizer

Table 4 Yield characters of coriander as influenced by different nutrient manage- ment practices under CBCS

Treatment	Number of seeds per um- bel			Projected seed yield(kg/ha)		
	2016	**2017**	**pooled**	**2016**	**2017**	**pooled**
N1	26.75	26.63	26.69	166.67	158.33	162.50
N2	27.67	27.57	27.62	193.33	186.67	190.00
N3	25.88	25.83	25.86	151.67	148.33	150.00
SEm (±)	**0.28**	**0.29**	**0.20**	**6.80**	**6.16**	**4.59**
C.D(P=0.05)	**0.78**	**0.80**	**0.46**	**18.85**	**17.07**	**10.56**

N1 : 100% RDF for main crops and intercrops from Chemical fertilizer
N2:25% RDN from organic manure+75%RDN from Chemical fertilizer
N3:50% RDN from organic manure+50%RDN from Chemical fertilizer

Number of umbel per plant

Among nutrient management practices, N2 recorded highest number of umbel per plant (21.76) in rabi 2016 and rabi 2017 (21.71) whereas N3 recorded lowest number umbel (20.29) in rabi 2016 and rabi 2017 (20.15).

Number of umbelets per umbel

Among nutrient management practices, N2 recorded highest number of umbelets per umbel (4.87) in rabi 2016 and rabi 2017 (4.72) whereas N3 recorded lowest number umbelets per umbel (3.9) in rabi 2016 and rabi 2017 (3.8).

Number of seeds per umbel

Among nutrient management practices, N2 recorded highest number of seeds per umbel (27.67) in rabi 2016 and rabi 2017 (27.57) whereas N3 recorded lowest number seeds per umbel (25.88) in rabi 2016 and rabi 2017 (25.83).

Projected seed yield (kg/ha)

Among nutrient management practices, N2 recorded highest projected seed yield (193.33) in rabi 2016 and rabi 2017 (186.67) whereas N3 recorded lowest projected yield (151.67) in rabi 2016 and rabi 2017 (148.33).

Present findings are in conformity with the reports of [7-10] in cucumber, [11] and [12] in cucumber.

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