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Research on the Growth and Quality of Coriander (*Coriandrum sativum* L.) Grown in Open Fields and Shade Net Environments

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ABSTRACT: The coriander (*Coriandrum sativum* L.) is a cool season crop and can be successfully cultivated in rabi season on black cotton or other type of heavy soils. The study was conducted in the College of agriculture, OUAT, Bhawanipatna to study the effect of season of sowing on foliage yield and quality of coriander under two different growing condition viz., open field and shade net (50%). The experiment was laid out in a Randomized Block Design (RBD) with eighteen treatments replicated thrice. Under Shade net grown coriander yielded well compared to open field condition. In open field condition there was no germination observed during summer months (March, April and May) while in shade net condition slight reduction of yield was observed compared to other months. In case of quality, no significance was observed between open field and shade net condition. In case of effect on month of sowing, October month recorded higher yield and quality for both the condition.

Keywords: Coriander, Shade net, Yield, Quality, Year, Production.

INTRODUCTION

Originating in the Mediterranean region, coriander (*Coriandrum sativum* L.), a significant spice crop, is a member of the Apiaceae family. The delicate leaves and grains of coriander are prized. As a cool-season crop, coriander can be grown successfully throughout the rabi season on heavy soils like black cotton that have a higher capacity to retain water. Given their delicate nature, coriander plants are extremely vulnerable to sudden changes in environmental conditions. The most important component in the summer production of coriander leaves is the soil temperature, particularly in the 0 0 afternoon (28.0°C to 32.5°C) (Sarada *et al.*, 2011). Coriander is grown year-round for its leaves.

Because late harvest results in bitter leaves, the plant must be harvested for its foliage before bolting. The ideal growing conditions for coriander foliage production are between 10 and 30 degrees Celsius (Anonymous, 2000). Consequently, high temperatures during the summer off-season have a detrimental impact on both the quantity and quality of this priceless crop. Because of the great demand, protected farming makes it possible to produce leafy coriander year-round and as an off-season commodity that can command higher prices on the market. It is advantageous to grow coriander under shade net protection because the shade nets reduce the interior temperature and give the crop partial shade, which promotes better plant growth and development and, in turn, increases the amount of foliage produced during the off-season.

Fresh coriander leaves are in constant demand throughout the year. In order to evaluate the performance of coriander under shade net and open field conditions for yield contributing characters and quality characters, the experiment was carried out.

MATERIALS AND METHODS

The study was conducted at OUAT's Bhawanipatna College of Agriculture. The experimental site is 248 meters above mean sea level and is located at (N 19° 54' 25.812" latitude, E 83° 10' 1.092" longitude). The field experiment, which was carried out between September and May, examined the impact of the sowing season on the quantity and quality of coriander leaves under two distinct growing conditions: open field and 50% shade net.

18 treatments were used in the experiment, which was set up using a Randomized Block Design (RBD) and reproduced three times. Details of the treatment were listed below. At the final harvest stage, the plant's height, measured from the cotyledonary node to the tip,

was recorded and converted to centimeters. At the final harvest stage, the number of primary branches—those that emerged from the main stem—was determined by counting and expressing them. Each treatment's plants were chosen at random, and the herbage's fresh weight at harvest was determined. The mean value was then stated in grams per plant. Following harvest, the fresh weight of the herbage per plot was measured in kilograms per plot by washing the soil that adhered to the roots.

Based on the yield per plot, the herbage yield per hectare was calculated for the cropped area and given in kilograms per hectare. Using the method outlined in the Association of Analytical Communities, the ascorbic acid content of coriander leaves was calculated 35 days after sowing (Anonymous, 1975). Using the methodology outlined by Chopra and Kanwar (1976), the crude fiber content of the leaves was determined and represented as a percentage. Using the method outlined by Ranganna (1986), leaf iron was calculated 35 days after sowing and reported in milligrams per 100 grams of fresh weight.

Using the Versanate method, leaf calcium was measured 35 days after seeding from the triple acid extract and quantified in milligrams per 100 grams of leaf material. Using a Clevenger device and hydro distillation, the essential oil content of the entire fresh herb was calculated. After six hours of hydro distillation, the oil content V/W of 100g of the plant was expressed as a percentage (%). The conventional technique was used to examine the data (Panse and Sukhatme 1985).

RESULTS AND DISCUSSION

In January, while the field was shadow netted, the tallest plant (28.15 cm) was recorded. For practically all seed spices, including coriander, the date of sowing was a crucial management consideration. The physical environment has a significant impact on coriander growth, biomass partitioning, and yield. Plant growth and productivity may be restricted by temperature, humidity, rainfall, and other climatic conditions, either separately or in combination. Crop phenological development and the effective conversion of biomass into economic yield are controlled by the time of planting (Khichar and Niwas 2006). When comparing the growing conditions, the highest mean plant heights in shade net and open field settings were 27.94 and 24.16 cm, respectively.

Plants sown in October benefited from an ideal climate that postponed the reproductive stage, and plants with a longer vegetative phase produced more fresh green leaves (Sagarika *et al.*, 2014). Due to more favorable temperatures during its growing phase, the October-planted crop showed better vegetative growth (Guha *et al*., 2016). Greater leaf area is responsible for the October-planted crop's highest biological output (Ayub *et al.*, 2008). The average leaf yield per plot was lower in the open field condition (2.52 kg/plot) and greater in the shade net condition (4.95 kg/plot). Open circumstances did not increase in March, April, or May. Growth and yield were minimal even in shade net conditions.

Sr. No.	Sowing Time	Condition of Field		Condition of Field	
		Open Field	Shednet	Open Field	Shednet
		Plant Height		Yield	
1.	Oct	21.62	26.63	2.52	4.95
2.	Nov	23.25	27.75	2.67	5.08
3.	Dec	22.82	26.68	2.95	5.32
4.	Jan	21.65	28.15	2.84	4.32
5.	Feb	23.42	27.95	2.76	4.18
6.	Mar	-	26.65	-	3.96
7.	Apr	-	25.84	-	4.15
8.	May	-	24.92	-	4.23
Mean		22.55	26.82	2.74	4.02
SE(d)		0.67	0.74	0.74	0.68
CD at 5%		1.86	1.97	2.12	1.84

CONCLUSIONS

The study's conclusions showed that growing coriander in a shade net environment is a lucrative way to produce fresh coriander leaves and earn money all year long, something that isn't feasible in an open field.

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