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PERFORMANCE OF CORIANDER VARIETIES UNDER SHADE NET CONDITION IN VILLUPURAM DISTRICT, TAMIL NADU, INDIA

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ABSTRACT

The field study was conducted to assess the performance of coriander varieties for leaf purpose under shade net in Villupuram district of Tamil Nadu during summer 2022-23. In this study, varieties CO 5, ACr 2 and AGCr 1 were evaluated under 50 per cent green agro shade net. Shade net is gaining popularity for growing horticultural crops. Germination was not significantly influenced by varieties. It is observed that germination was noticed from 9.7 to 11.6 days. The uniform germination was observed in all coriander varieties. The germination percentage was found higher in CO 5 (85.1) followed by AGCr 1 (82.8). There was significant difference observed in plant height among coriander varieties. The plant height was higher in coriander variety CO 5 (28.5 cm) followed by ACr 2 (27.5 cm). The results indicated that growing of coriander in shade significantly increased herbage yield. The coriander variety CO 5 produced highest herbage yield (4.72 tonnes/ ha) followed by ACr 2 (4.58 tonnes/ha) and AGCr 1 (4.54 tonnes/ ha). The gross income was higher in coriander variety CO 5 (Rs. 2,10,820/-) followed by ACr2 (Rs. 2,01,370/-). The net income of Rs. 1,22,580/- was recorded in coriander variety CO 5 with BCR of 2.39 followed by ACr2 with net income of Rs. 1,11,210 and BCR of 2.23. Coriander varieties CO 5, ACr 2 and AGCr 1 were found suitable for cultivation under 50% shade net condition.

Key words : Coriander, Germination, Plant height, Herbage yield, Cost economics.

Introduction

Coriander (*Coriandrum sativum* L.) is native to Southern Europe and North Africa to South Western Asia. It belongs to the family Apiaceae. It is widely as green leafy vegetable. Coriander leaves are added into curries, soups, chutney, vegetable pulao and chicken / mutton biriyani for enhancing pleasant aroma, flavour and taste. The demand for coriander leaves prevails throughout the year. Leaves are rich in minerals like calcium, phosphorus and iron and vitamins like vitamin A, C, riboflavin and folic acid. Cultivation of coriander during summer is difficult under open condition due to failure of seed germination. The prevalence of high temperature during summer hinders the germination. The temperature of 10-30°C and soil temperature (28-32.5°C) was optimum for high herbage production (Sarada *et al.*, 2011). During summer, protected structures *viz.*, poly house and shade

net are used to improve the yield and quality of vegetables (Shahak *et al.*, 2008). Shade net condition (50% shade) is suitable for cultivating coriander (Guha *et al.*, 2016; Gowtham and Mohanalakshmi, 2018). Shade net is one of the best protected and low cost structures for reducing temperature up to 5°C and heat in cultivation of coriander for leaf purpose.

Microclimate regulation inside shade net house has profound influence on growth and ultimately the yield and quality produce. Temperature and relative humidity inside shade net house may individually or collectively limit the growth and development of plants. The temperature and penetration of light into shade net is much lower than outside temperature and light intensity. Mean temperature and light intensity during summer and winter were lower in shade net house than open field conditions (Rajasekar *et al.*, 2013). The herbage yield is

high under protected cultivation compared to open condition (Singh and Choudhary, 2020). In addition to this, cultivation of coriander for leaf purpose under the shade net has numerous advantages, including better productive period, delayed bolting, superior quality, off-season production and high profit per unit area. Selection of shade net house should be based on shape of house. Season, date of sowing, shading intensity, genotype (Sarada, 2018), variety (Khah, 2009), light intensity (Desai *et al.*, 2016), soil temperature (Sarada *et al.*, 2011) and irrigation methods (Lal *et al.*, 2015) influences the herbage yield in coriander. Weather conditions inside the dome shaped shade net house favours cultivation of coriander. 50% shade net was found optimum for growing coriander for leaf purpose (Lal *et al.*, 2016; Mahajan *et al.*, 2017). Keeping these views in mind, the trial was conducted during summer season of 2023 in Villupuram district to assess the performance of coriander varieties under shade net condition.

Materials and Methods

The field study was conducted on cultivation of coriander varieties under shade net condition at Villupuram district, Tamil Nadu, India during summer season of 2023. The experiment was laid out in a completely randomized block design. Coriander varieties ACr 2, AGCr 1, CO 5 and local cultivar were used in this experiment. ACr 2 is a dual purpose variety with attractive green with good aroma and high yielding. A shade net house with 50% green agro shade net. The land is ploughed inside the shade net house and weeds were removed. The enriched farm yard manure with *Azospirillum*, *phosphobacteria* and *potash bacteria* was applied into beds and mixed well. The raised beds of 3 feet width were formed. The coriander seeds were split into 2 halves and tied with cotton cloth and dipped in water for 30 minutes. Then coriander seeds tied with cotton cloth were taken out from water and kept overnight. The next day morning, the seeds were washed with water and mixed with *Trichoderma viride* at the rate of 4 g/kg of seed followed by *Azospirillum* with rice gruel. The treated seeds were dried under shade for 30 minutes. The seeds were sown in nursery beds in March at a spacing of 15 cm × 5 cm. The intercultural operations were followed as standard horticultural practices to raise the healthy crop. Harvesting of plants was done after 45 days of sowing.

The growth and yield parameters *viz.*, days taken for germination, germination percentage, number of primary branches, plant height and herbage yield were recorded. The data on germination was recorded and subjected to statistical analysis. The gross cost, gross

income, net income and BCR were calculated for coriander varieties and local. The data were statistically analysed as per the method suggested by Panse and Sukhatme (1985).

Results and Discussion

The growth and yield parameters of coriander are presented in Table 1. Germination was not significantly influenced by varieties. It is observed that germination was noticed from 9.7 to 11.6 days. The germination was recorded as 8 days in coriander var. JD1 (Mahajan *et al.*, 2017) and 10.50 days in coriander var. AGCr 1 (Lal *et al.*, 2016). The germination percentage was found higher in CO 5 (85.1) followed by AGCr 1 (82.8). The genetic purity and soaking of seeds in water improved a germination percentage. There was significant difference observed in plant height among varieties. The plant height was higher in coriander variety CO 5 (28.5 cm) followed by ACr 2 (27.5 cm). The growth was better in all varieties under shade net condition due to the genetic character of these varieties. The plant height was significantly higher in 50% shading intensity at all crop growth stages due to low light level. There was no significant difference in number of branches among coriander varieties grown under shade net condition. The number of branches was recorded higher in CO 5 (3.5) followed by AGCr 1 (3.3) and ACr 2 (3.2). The significantly maximum number of branches per plant was recorded in 50% shading intensity at all crop growth stages (3.47, 5.07 and 6.17 at 21, 28 DAS and at harvest, respectively), which were at par with 75 per cent shading intensities at 21 DAS and at harvest (Mahajan *et al.*, 2017). The number of days required for harvesting was lower in coriander varieties (45 days) compared to variety local (47 days).

The results indicated that growing of coriander in shade significantly increased herbage yield. The coriander variety CO 5 produced highest herbage yield (47.2 kg/100 m²) followed by ACr 2 (45.8 kg/100 m²) and AGCr 1 (45.4 kg/100 m²). The coriander variety CO 5 produced highest herbage yield (4.72 tonnes/ha) followed by ACr 2 (4.58 tonnes/ha) and AGCr 1 (4.54 tonnes/ha). The leaf yield of 5.02 tonnes per hectare was recorded in coriander var. JD1 under 50% shade net compared to coriander grown in open condition (1.13 tonnes per hectare (Mahajan *et al.*, 2017). The higher yield was recorded in shade condition during summer in fenugreek and coriander (Dixit *et al.*, 2005; Kotadia *et al.*, 2012). This might be due to presence of suitable temperature and light inside 50% shade net house favours germination and growth. The green leaf yield was recorded maximum in AGCr 1 (2.73 tonnes/ha) compared to ACr 1 (1.65

Table 1 : Growth and yield parameters of coriander varieties under shade net condition.

Coriander varieties	Days taken for germination	Germination (%)	Plant height (cm)	No. of branches	Herbage yield (kg/100m ²)	Herbage yield (t/ha)
ACr 2	9.8	80.3	27.5	3.2	45.8	4.58
AGCr 1	9.9	82.8	24.4	3.3	45.4	4.54
CO5	9.7	85.1	28.5	3.5	47.2	4.72
Local	11.6	55.7	19.3	2.0	25.3	2.53
Mean	10.3	76.0	24.9	3.0	40.9	4.09
SEd	0.18	1.42	0.78	0.20	0.91	0.34
CD (p=0.05)	0.36	2.81	1.43	0.41	1.82	0.68

Table 2 : Cost economics of coriander varieties cultivated under shade net condition

Coriander varieties	Gross cost (Rs./ha)	Gross income (Rs./ha)	Net income (Rs./ha)	BCR
ACr 2	90,100	2,01,370	1,11,210	2.23
AGCr 1	81,450	1,81,900	1,00,450	2.23
CO5	88,240	2,10,820	1,22,580	2.39
Local	89,500	1,25,400	35,900	1.40

tonnes/ha) in Ajmer condition (Lal *et al.*, 2018). The date of sowing and growing conditions influenced the leaf yield in coriander var. Gujarat coriander 2 (Karetha *et al.*, 2014). The late sowing time was found promising for growing coriander var. Surabhi (Chaulagain *et al.*, 2011). Sarada (2018) reported that LCC-244 recorded significantly higher yield (3.18 tonnes /ha) being on par with LCC-234 (2.89 tonnes / ha). The gross income was higher in coriander variety CO 5 (Rs. 2,10,820/-) followed by ACr 2 (Rs. 2,01,370/-). The net income of Rs. 1,22,580/- was recorded in coriander variety CO 5 with BCR of 2.39 followed by ACr 2 with net income of Rs. 1,11,210 and BCR of 2.23.

Conclusion

The herbage yield was higher in coriander variety CO 5 followed by ACr 2 and AGCr 1. Coriander varieties CO 5, ACr 2 and AGCr 1 were found suitable for growing under shade net condition in Villupuram district. The higher net income was obtained from shade net cultivation of coriander variety CO 5. Since coriander leaves is in huge demand, there is a lot of scope for up scaling the coriander cultivation for leaf purpose under shade net condition throughout the year especially during summer.

Statements and declarations

No potential conflict of interest was reported by the author.

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