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Impact of bio-fertilizers on growth and seed yield of coriander (*Coriandrum sativum* L.) var. Konkan Kasturi under Konkan region

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Abstract

The present investigation entitled “Effect of bio-fertilizers on growth, seed yield of coriander (*Coriandrum sativum* L.) var. Konkan Kasturi under Konkan region” was conducted during “Rabi season” (January 2021 –March-2021) at High-Tech nursery of College of Horticulture, Dapoli under Konkan agro-climatic condition of Maharashtra. The experiment was conducted in Randomized Block Design (RBD) with seven treatments and three replications. The treatments comprises; T₁-Control, T₂-RDF (80:40:40 kg NPK/ha + 10 t/ha FYM), T₃-RDF + *Azotobacter*, T₄-RDF + *Azospirillum*, T₅-RDF + PSB, T₆-RDF + *Azotobacter* + PSB, T₇-RDF+ *Azospirillum* + PSB. The different treatments studied in which the treatment T₇ (RDF+ *Azospirillum* + PSB) recorded the highest growth, yield and quality parameters in comparison to control and other treatments.

Keywords: Coriander, azotobacter, Azospirillum, PSB, RDF

Introduction

India is the largest producer of coriander having an area of 629 thousand hectares with annual production of 756 thousand metric tons (NHB 2020). It is mainly cultivated in Madhya Pradesh, Rajasthan, Gujarat, Assam, Haryana and Maharashtra. The Madhya Pradesh produced the largest volume of coriander seeds in fiscal year 2020 across India. Maharashtra stands at sixth position and it produces around 4390 tons.

Residue free farming is important and getting more attention during these days. Conserve soil health, soil structure and soil microbial status, we have to apply nutrients judiciously with integrated nutrient management approach. In recent and past years, bio-fertilizers have emerged as an important component of integrated nutrient supply system and have shown promise to improve crop yields and nutrient supplies. *Azotobacter*, *Azospirillum* and Phosphorus Solubilizing Bacteria are the most wide spread bio-fertilizers, significantly contributing not only N, P and K to plants but also provides resistance to drought situation (Maheshwari *et al.*, 1991) [5].

Bio-fertilizers combinations were ecologically safe and improve soil fertility by improving the soil physical, chemical and biological condition. Bio-fertilizers are less expensive, eco-friendly and sustainable likely to greater significance as a compliment or supplement to inorganic fertilizer (Malhotra *et al.*, 2006) [6].

Material and Methods

The field experiment was carried out at the High-Tech Department College of Horticulture, Dapoli, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Dist. Ratnagiri during the year 2020-2021. The experiment was conducted in Randomized Block Design (RBD) with seven treatments and three replications. The seeds were sown in the plot of 3m X 2.20 m at line spacing 0.45 m. The crop was fertilized with 10 t of FYM along with NPK @ 80: 40: 40 kg/ha. One third dose of nitrogen and full dose of phosphorous and potash applied as basal dose and two third dose of nitrogen was applied as top dressing in two equal splits before irrigation i.e. at 30 and 60 DAS. Need based cultural and plant protection operations were taken up to harvest good crop, Five plant samples from each replication were selected at random to record growth and yield attributing characters. The experimental data was analysed statistically by the method of analysis of variance described by Panse and Sukhatme (1995) [8].

Results and Discussion

The data pertaining to the effect of bio-fertilizers on growth of coriander cv. Konkan Kasturi have been presented in Table 1, there was significant difference among the treatments at 30, 60 DAS and at harvest. Highest height (75.67 cm) was observed in the treatment T₇-RDF + *Azospirillum* + PSB which was at par with treatments T₆-RDF + Azotobacter + PSB (73.73 cm) while the control recorded the lowest height (49.61 cm). It is evident from the result that the application of bio-fertilizers viz., *Azospirillum* and PSB had significantly influenced plant height of coriander it could be due to the availability of atmospheric nitrogen and soil phosphorus. This might have led to better root and shoot development, better uptake of water, nutrients and their transportation. This is in confirmation with Chandregowda *et al.* (2007)^[3], Mehta *et al.* (2012)^[7] in fenugreek, Akhani *et al.* (2012)^[1] in coriander, Desai and Thirumala (2014)^[4] in coleus.

The data pertaining to effect of bio-fertilizers on primary branches of coriander cv. Konkan Kasturi presented in Table 2 it was seen that, maximum number of branches at harvest observe in treatment T₇-RDF + *Azospirillum* + PSB (8.07) which was found at par with treatments T₆ - RDF + Azotobacter + PSB (7.53), While, the minimum number of primary branches) was recorded in treatment T₁- Control (4.33)

The highest primary branches recorded with *Azospirillum* + Phosphate solubilizing bacteria might be due to the secretion of growth promoting substances. These bio-fertilizers make available atmospheric nitrogen and soil phosphorus, which might have led to better root and shoot development, better uptake of water, nutrients and their transportation. The results are in accordance with the findings of Malhotra *et al.* (2006)^[6] in coriander, Singh (2012)^[9] in fennel and Singh (2014)^[10] in coriander.

The data pertaining to effect of biofertilizers on seed yield and straw yield per hectare (kg) coriander cv. Konkan Kasturi presented in Table 3 it was seen that, maximum seed and straw yield was observe in treatment T₇-RDF + *Azospirillum* + PSB (1226.543 and 1708.02) While, the minimum seed and straw yield was recorded in treatment T₁- Control (546.293 and 1006.17).

It might have been due to the atmospheric nitrogen fixing capacity of *Azospirillum* and this fixed nitrogen was made available to the crop, throughout the crop period. Inoculation of PSB increased the availability of insoluble 'P' and gave a constant supply of phosphorus throughout the growth of crop which enhanced all yield components. Similar results were found by Mehta *et al.* (2012)^[7] in fenugreek.

Table 1: Effect of bio-fertilizer on plant height (cm) at different growth stages of coriander cv. Konkan Kasturi

Treatments	Plant height (cm)		
	30 DAS	60 DAS	At Harvest
T ₁	14.57	42.36	49.61
T ₂	18.34	57.20	62.15
T ₃	19.27	61.17	69.97
T ₄	21.00	61.95	70.73
T ₅	20.88	60.69	67.66
T ₆	23.14	66.94	73.73
T ₇	23.28	67.37	75.67
Mean	20.07	59.67	67.08
S.Em±	0.49	0.62	1.48
CD @ 5%	1.51	1.93	4.58

Table 2: Effect of bio-fertilizers on primary branches at different growth stages of coriander cv. Konkan Kasturi

Treatments	Number of primary branches			
	45 DAS	60 DAS	75 DAS	At harvest
T ₁	1.33	2.80	4.27	4.33
T ₂	2.33	4.27	6.13	6.27
T ₃	2.87	4.93	6.60	6.67
T ₄	2.73	4.87	6.53	6.60
T ₅	2.60	4.53	6.27	6.40
T ₆	2.93	5.13	7.27	7.53
T ₇	3.00	5.80	7.87	8.07
Mean	2.54	4.62	6.42	6.55
S.Em±	0.25	0.25	0.18	0.19
CD @ 5%	0.77	0.76	0.54	0.59

Table 3: Effect of bio-fertilizers on seed yield and straw yield per ha (kg) of coriander cv. Konkan Kasturi

Treatments	Seed yield per ha (kg)	Straw yield per ha (kg)
T ₁	546.293	1006.17
T ₂	1008.025	1506.79
T ₃	1053.704	1569.75
T ₄	1146.296	1600.61
T ₅	1204.321	1662.34
T ₆	1174.691	1579.63
T ₇	1226.543	1708.02
Mean	1051.41	1519.04
S.Em±	8.55	12.63
CD @ 5%	26.35	38.93

References

1. Akhani A, Darzi MT, SeyedHadi MH. Effects of biofertilizer and plant density on yield components and seed yield of coriander (*Coriandrum sativum* L.). International Journal of Agriculture and Crop Sciences 2012;4(16):1205-1211.
2. Anonymous. National Horticulture Board. Area and Production statistics of Horticulture Crops. Ministry of Agriculture, Government of India, 2020.
3. Chandregowda M, Vijaykumar M, Mallikarjunagowda A. P. Influence of integrated nutrient management on growth, yield and quality of garlic (*Allium sativum* L.). cv. G-282. Crop Research 2007;33(1-3):144-147.
4. Desai N, Thirumala S. Effect of bio-fertilizers on growth and biomass of *Coleus Vettiveroides*. International Journal of Advanced Agricultural Sciences and Technology 2014;3(1):53-57.
5. Maheshwari SK, Gangreede SK, Trivedi KC. Comparative response of palmarosa to Azotobacter and nitrogen under rainfed and irrigated swards. Indian Perf, 1991;35(2):108-111.
6. Malhotra SK, Vashishtha BB, Apparao VV. Influence of nitrogen, *Azospirillum* sp. and farm yard manure on growth, yield and incidence of stem gall disease in coriander (*Coriandrum sativum* L.). Journal of Spices and Aromatic Crops 2006;15(2):115-117.
7. Mehta RS, Anwer MM, Aishwath OP, Meena RS. Growth, yield and quality of fenugreek (*Trigonella foenum-graecum* L.) as influenced by nitrogen, phosphorus and bio-fertilizers. Indian Journal of Horticulture 2012;69(1):94-97.
8. Panse VG, Sukhatme PV. Statistical Methods for Agricultural Workers. 4th Edition, Indian Council of Agricultural Research, New Delhi 1995, 1-347.

9. Singh SP. Response of bio-fertilizer *Azospirillum* on growth and yield of fennel cv. *Rajendra saurabh*. The Asian Journal of Horticulture 2012;7(2):561-564.
10. Singh SP. Effect of bio-fertilizer *Azospirillum* on growth and yield parameters of Coriander (*Coriandrum sativum* L.) cv. Pant Haritima. International Journal of Seed Spices 2014;4(2):73-76.