

Response of coriander based intercropping with garlic on productivity and profitability in Haroti region of Rajasthan

D. K. Singh, T. C Verma, M. A. Khan¹ and K. M. Gautam²

Krishi Vigyan Kendra, Anta, Baran- Rajasthan-325202

¹National Research Centre on Seed Spices, Tabiji, Ajmer (Raj.)

²Directorate of Extension Education, Agricultural University, Kota (Raj.)

Abstract

The experiment was conducted on intercropping of coriander with garlic during rabi season of the year 2017-18. The plant height of garlic increased significantly with intercropping of coriander with garlic and slight decrease in growth parameter of garlic like number of leaves plant⁻¹, bulb weight, bulb diameter and number of cloves bulb⁻¹ was recorded. Intercropping of coriander slightly decreased the yield of garlic which is non-significant. The result further reveals that the highest yield of garlic (84.89q ha⁻¹) was recorded in sole crop. Significantly the highest net return of ₹ 1.61 lakh ha⁻¹ and Benefit cost ratio of 2.48 was recorded in intercropping of coriander with garlic sown in east to west direction. Thus, it is inferred that intercropping of coriander with garlic in sown east to west direction is better for realizing higher yield, system productivity and profitability.

Key words: Coriander, B:C ratio, garlic, intercropping, quality

Introduction

Garlic (*Allium sativum* L.) is the most important underground bulb crop grown in irrigated condition and used as a spice or a condiment throughout India. It is also an important foreign exchange earner for India. In Rajasthan, it is largely grown in Baran, Jhalawar, Kota, Bundi (Haroti region), Chittorgarh, Jodhpur and Pratapgarh districts along the irrigated tracts. Garlic forms principal ingredients in spicy foods especially non-vegetarian cuisines. Spicy preparations, preparations based on meat, instant food, chips and papad, depends largely on garlic or its derivatives. Now a days pastes, powder, flakes, garlic capsules are gaining popularity in the market. Many cottage processors are in the field of garlic processed products. Processed products quality is depending on the bulb quality of garlic and there are some agro techniques to improve or maintain the quality parameter of bulb. The production of garlic is high in sandy loam or silt loam soil having friable, fertile and good water holding capacity. Cultural practices are most important factor affecting the production and productivity of garlic crop. The seed of garlic is sown in rabi season by garlic planter in proper spacing and a ridge is formed on both side of planter remains unutilized. Coriander is also the main seed spices grown for seed and leafy vegetable purpose. The coriander is sold in market in the nick name of 'haroti dhania'. The bold seed size is the prime liking of the farmers. Rajasthan and Gujarat have been emerged

as "Seed spice bowl" and together contribute more than 80% of total seed spices produced in the country (Lal *et al.* 2011) and to some extent grown in Andhra Pradesh, Gujarat and Madhya Pradesh. Hence, a field trial was conducted to standardize intercropping of coriander with garlic in different direction.

A field experiment was conducted at Krishi Vigyan Kendra, Anta, Baran, (Rajasthan), during rabi season of 2017-18. The district Baran comes under zone V (Humid South Eastern Plain) of Rajasthan which covers a geographical area of about 2.7 million hectare. The average rainfall varies from 650 – 1000 mm. The maximum mean daily temperature ranges from 24.5°C in the month of January and 42.6°C in May and minimum 10°C in January & 19.7°C in month of May. The experimental sites soil was black alluvial origin with good drainage system and soil pH varied from 7.42-8.55 and EC 0.543-0.892 dSm⁻¹. Soils were low in nitrogen, medium in phosphorus and high in potassium content. The coriander is sown manually as intercrop on 20th October 2017 in garlic cropping system in north to south and east to west direction at 2.10 meter distance on ridges formed by garlic planter and compared with garlic sole crop. The treatments were laid out in randomized block design with four replications. Recommended cultural operations and plant protection measures were followed to raise a healthy crop (Anonymous, 2005). The observations were recorded on 10 randomly selected

plants for plant height (cm), number of leaves plant⁻¹, bulb weight (g), bulb diameter (cm) number of cloves bulb⁻¹, yield hectare⁻¹ (q). Ten plants selected randomly from each treatment for record of morphological and yield contributing characters and were statistically analyzed. Economics of the crops were calculated on the basis of prices in local market. The data were analyzed as per statistical procedure.

Growth attributes of garlic like number of leaves, bulb weight, and bulb diameter and number of cloves bulb⁻¹ slightly decreased in intercropping of coriander with garlic (Table 1). Plant height of garlic increased in intercropping of coriander with garlic and the highest plant height was recorded in east to west direction of coriander sowing. Intercropping of coriander with garlic slightly decreased the yield of garlic which was non significant. Intercropping of turmeric in guava orchards was also increased the income of farmers in Baran district of Rajasthan (Singh *et al.*, 2014). Although the highest yield of garlic (84.89q ha⁻¹) was recorded in sole crop. Sowing of coriander in north to south direction increased the yield of coriander in comparison of east to west direction. The increase of coriander yield in north to south direction was due to radiation effect confirming the result of Singh *et al.*, (2012) on sowing direction in coriander.

The economic parameters are depicted in table 2. The highest net return of ₹ 1.61 lakh ha⁻¹ was recorded in

intercropping of coriander with garlic sown in east to west direction. The highest cost of cultivation (₹ 1.21 lakh ha⁻¹) was involved in garlic cultivation (Fig.1). The quality of garlic increased with the application of potassic fertilizes (Bajpai *et al.*, 2014). The gross return was found higher in garlic cultivation but the net return was lower due to the high cost of cultivation. The result further reveals that higher net return of ₹ 1.61 lakh ha⁻¹ and benefit cost ratio of 2.48 was recorded in cultivation of coriander was recorded in intercropping of coriander with garlic sown in east to west direction. Thus, it is inferred that intercropping of coriander with garlic in east to west direction is better for realizing higher yield, system productivity and profitability.



Fig.1. Jerking of garlic plant after irrigation 30 and 60 DAS.

Table 1. Response of different direction of sowing of coriander on growth and yield of garlic var. G-282.

Treatments	Plant height (cm)	No. of leaves plant ⁻¹ (30 DAS)	Bulb wt. (g)	Bulb diameter (cm)	No. of cloves bulb ⁻¹	Yield (q ha ⁻¹)	
						Garlic	Coriander
Garlic (sole)	28.64	5.85	47.13	4.87	27.25	84.89	00
Garlic + coriander (E-W)	32.01	5.45	45.93	4.35	26.25	83.61	4.36
Garlic+ coriander (N-S)	30.54	5.55	44.19	4.33	25.75	81.02	4.91
CD (P = 0.05)	1.081	1.121	2.453	0.989	2.441	NS	NS

Table 2. Economic performances of sole and intercrop of coriander in different direction of sowing. (₹ in lakh)

Treatments	Cost of cultivation* (₹ ha ⁻¹)			Gross Return** (₹ ha ⁻¹)			Net Return (₹ ha ⁻¹)			Benefit cost ratio		
	Garlic	Coriander	Total	Garlic	Coriander	Total	Garlic	Coriander	Total	Garlic	Coriander	Average
Garlic (sole)	1.21	00	1.21	2.72	00	2.72	1.51	00	1.51	2.24	00	2.24
Garlic + coriander (E-W)	1.21	0.08	1.29	2.68	0.22	2.90	1.47	0.14	1.61	2.21	2.75	2.48
Garlic+ coriander (N-S)	1.21	0.08	1.29	2.59	0.25	2.84	1.39	0.17	1.56	2.14	2.59	2.37
CD (P = 0.05)	1.081	1.121	2.453	0.989	0.989	2.441	2.981	NS				

*Total variable cost (includes cost of ploughing, pesticide, seed, fertilizer, irrigation and labour cost)

**Market price of garlic is ₹ 32 kg⁻¹ and coriander is ₹ 50 kg⁻¹

References

- Anonymous, 2005. FAO Statistical Database. www.FAO.org.
- Bajpai, N.K., Jeengar, K.L., Singh, D.K., Gupta, I.N. and Meena, S. N. 2014. Use of potassic fertilizer in garlic (*Allium sativum*) for managing pest and improving yield. *Current Advances in Agricultural Sciences*. 6(2):201-202.
- Lal, G., Vashisth, T., Mehta, R. S. and Ali, S. F. 2011. Studies on different organic modules for yield and quality of coriander (*Coriandrum sativum* L.). *International J. of Seed Science*, 2(1): 1-6.
- Singh, D. K., Chaudhary, P. C. and Khan, M. A. 2012. Response of direction of sowing of coriander (*Coriandrum sativum* L.) varieties in Baran district of Rajasthan. *International J. seed Spices*. 2(2):54-56.
- Singh, D. K., Aswal, S. Aswani, G. and Shivhare, M. K. 2014. Performance of planting material on growth and yield of turmeric under guava based Agri-hort system. *Range and Mgmt. & Agroforestry* 36(1): 133-136.

Received : May 2018; Revised : June 2018;
Accepted : June 2018.