

Effect of Organic, Inorganic & Biofertilizers on Economy of Cabbage (*Brassica oleracea* var. *capitata*)

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ABSTRACT

The field experiment was conducted during Rabi season of 2016-17 at the Horticulture Research cum Instructional farm, BTC CARS, Bilaspur (C.G.). The treatments consisted of eleven combination of different agro input management practices viz., treatments 100 % RDF (Control) (T_1), 75 % RDF + 25 % N through FYM (T_2), 75 % RDF + 25 % N through VC (T_3), 50 % RDF + 50 % N through FYM (T_4), 50 % RDF + 50 % N through VC (T_5), 125% RDF (T_6), 100 % RDF + 25% N through FYM (T_7), 100 % RDF + 25% N through VC (T_8), 100 % RDF + 25% N through FYM + Azotobacter @ 2 kg ha⁻¹+PSB @ 2 kg ha⁻¹ (T_9), 100 % RDF + 25% N through VC+ Azotobacter @ 2 kg ha⁻¹+PSB @ 2 kg ha⁻¹ (T_{10}), 100 % from organic FYM+VC+AZ+PSB (T_{11}). The maximum net profit/ha was recorded under treatment T_{10} (Rs. 185967.68) while minimum net profit/ha was obtained in treatment T_4 (Rs. 91028.40). The significantly maximum gross profit/ha was recorded in treatment T_{10} (Rs. 233690.00) whereas, minimum gross profit/ha was recorded in treatment T_4 (Rs. 146785.00). Thus, the maximum income (both gross and net) was obtained with T_{10} . The significantly maximum B:C ratio 4.59 was recorded under the application of 125% RDF (T_6). And the minimum B:C ratio 1.63 was recorded under the application of 100 % from organic FYM+VC+AZ+PSB (T_{11}).

Key words: Organic, Inorganic, Biofertilizer, and Cabbage.

INTRODUCTION

Cabbage (*Brassica oleracea* var. *capitata* L.) is an important winter vegetable crop. From the nutritional point of view, it is a rich source of vitamin A, B & C, mineral, minor in fibers and carbohydrates. The major cabbage producing states are U.P., Odisha, Bihar, Assam, West Bengal, Maharashtra and Karnataka. In India annual production of the cabbage is 9039.2 Mt (5.5% of total vegetables production) from an

area of about 0.400ha (4.3% of total vegetable area) with the productivity of 22.6 Mt /ha. (Anon. 2014). In Chhattisgarh, 403.4 '000 hectare area is under the vegetable cultivation with production of 5565.9'000 MT with productivity of 13.5 Mt/ha out of which cabbage is cultivated in an area of 18.6 '000 hectare producing 338.6 '000 Mt with productivity of 18.2 Mt/ha (Anon. 2014).

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It is cultivated in almost all districts of Chhattisgarh viz., Gariabandh, Baloda Bazar, Mahasamund, Dhamtari, Raipur, Durg, Balod, Bemetara, Jagdalpur, Kondagoan, Kanker, Bilaspur, Janjgir-Champa, Korba, Raigarh, Surguja, Surajpur, Koriya and Balrampur. Cabbage is a heavy feeder and removes the N, P and K from soil to a larger extent. In modern agriculture, continuous and indiscriminate use of chemical fertilizers, pesticides, herbicides etc. affect's the biodiversity, quality of the produce and human health. There are also evidences that the intensive agriculture has resulted in decline in vitamin and mineral content of fresh fruits and vegetables over last six decades. Use of organic manures along with bio-fertilizers is not only helpful in improving soil health, growth, yield and quality but also avoids chemical based farming². Use of organic, inorganic & biofertilizers help in mitigating multiple nutrient deficiencies. Application of organic manures to acidic soil reduces the soluble and exchangeable Al temporarily by forming complex and provides better environment for growth and development by improving physical, chemical and biological properties of soil.

MATERIAL AND METHODS

Economics (Rs)

Cost of cultivation for each treatment was worked out separately gross return (Rs ha⁻¹)

was obtained by converting the harvest in to monetary terms at the prevailing market rate during the course of investigation. Net return was obtained by deducting cost of cultivation from gross return. The benefit: cost ratio was calculated with the help of following formula³.

$$\text{Benefit cost ratio} = \frac{\text{Gross return (Rs)}}{\text{Total cost of cultivation}}$$

RESULTS AND DISCUSSION

The economics of all the treatments are given in Table 4.14. The net profit/ha ranged from Rs. 91028.40. (T₁₁) to Rs. 185967.68 (T₁₀) the maximum net profit/ha was recorded under T₁₀: (Rs. 185967.68). While minimum net profit/ha was obtained in T₄: (Rs. 91028.40). The gross profit/ha ranged from Rs. 146785.00 to Rs. 233690.00 The maximum gross profit/ha was recorded in T₁₀: (Rs. 233690.00). Where as minimum gross profit/ha was recorded in T₄: (Rs. 146785.00). Thus, the maximum income (both gross and net) was obtained with T₁₀ and the lowest income (both gross and net) was obtained with T₄: The benefit cost ratio ranged from 1.63 to 4.59 depending on different treatments. It was found to be highest (4.59) under the T₆ and the lowest (1.63) under the T₁₁: The total cost of cultivation was maximum (Rs. 56.6) under the treatment T₁₁: 100 % from organic FYM+VC+AZ+PSB.

Table 1: Effect of organic, inorganic and biofertilizers on economics of cabbage

Treatments	Cost of cultivation (Rs)	Yield (Q/ha)	Gross Profit (Rs ha ⁻¹)	Net Profit (Rs. ha ⁻¹)	B:C ratio
T ₁ : 100 % RDF (Control)	38722.9	429.28	214640.00	175917.08	4.54
T ₂ : 75 % RDF + 25 % N through FYM	41226.43	362.73	181365.00	140138.57	3.30
T ₃ : 75 % RDF + 25 % N through VC	43225.8	384.52	192260.00	149034.16	3.45
T ₄ : 50 % RDF + 50 % N through FYM	43790.8	334.52	167260.00	123469.25	2.82
T ₅ : 50 % RDF + 50 % N through VC	47789.8	350.00	175000.00	127210.25	2.66
T ₆ : 125% RDF	40214.1	449.52	224760.00	184545.86	4.59
T ₇ : 100 % RDF + 25% N through FYM	42722.9	400.00	200000.00	157277.09	3.68
T ₈ : 100 % RDF + 25% N through VC	44722.3	411.90	205950.00	161227.68	3.61
T ₉ : 100 % RDF + 25% N through FYM + <i>Azotobacter</i> @ 2 kg ha ⁻¹ +PSB @ 2 kg ha ⁻¹	47722.3	460.23	230115.00	182392.68	3.82
T ₁₀ : 100 % RDF + 25% N through VC+ <i>Azotobacter</i> @ 2 kg ha ⁻¹ + PSB @ 2 kg ha ⁻¹	47722.3	467.38	233690.00	185967.68	3.90
T ₁₁ : 100 % from organic FYM+VC+AZ+PSB	55756.6	293.57	146785.00	91028.40	1.63

557 and significantly minimum total cost of cultivation are recorded (Rs. 38722.9) under the treatment T₁: 100 % RDF (Control). Application of T₁₀: 100 % RDF + 25% N through VC+ *Azotobacter* @ 2 kg ha⁻¹ + PSB @ 2 kg ha⁻¹ had given the higher gross return because of higher yield, but the B:C ratio is comparatively lower under this treatment this can be explained as the higher cost involved with organic sources of fertilizer and similar price of produce as considered for the other treatments. If the price of produce would be considered as organically produced crop which will be much more higher than that with chemical fertilizer. Similar results were also reported by Upadhyay, *et al*⁴.

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