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Influence of integrated nutrient management on growth, yield and quality of cabbage (*Brassica oleracea* var. *capitata*)

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Abstract
The field experiment was conducted during *Rabi* season of 2017-18 at the Horticulture Research farm, AKS University, Satna (M.P.). The experiment was laid out in a randomized block design with three replications. The treatments consisted of nine combination of different agro input management practices viz., treatments 100 % RDF (Control) (T_1), 75 % RDF + 25 % N through VC (T_2), 75 % RDF + 25 % N through FYM (T_3), 50 % RDF + 50 % N through VC (T_4), 50 % RDF + 50 % N through FYM (T_5), 100 % RDF + 25% N through VC (T_6), 100 % RDF + 25% N through FYM (T_7), 100 % RDF + 25% N through FYM + *Azotobacter* @ 2 kg ha^{-1}+PSB @ 2 kg ha^{-1} (T_8), 100 % RDF + 25% N through VC+ *Azotobacter* @ 2 kg ha^{-1}+PSB @ 2 kg ha^{-1} (T_9). The maximum net profit/ha was recorded under treatment T_9 (Rs. 182392.68) while minimum net profit/ha was obtained in treatment T_4 (Rs. 123469.25). The maximum gross profit/ha was recorded in treatment T_9 (Rs. 230115.00) whereas, minimum gross profit/ha was recorded in treatment T_4 (Rs. 167260.00). Thus, the maximum income (both gross and net) was obtained with T_{10}. The significantly maximum B:C ratio 4.54 was recorded under the treatment (T_1). And the minimum B:C ratio 2.66 was recorded under the treatment (T_5).

Keywords: Organic, inorganic, biofertilizer, INM 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) [1].

In Madhya Pradesh, 0.02 m/ha. Area is under the vegetable cultivation with production of 0.58 mt/ha. Out of which cabbage is cultivated in area of 18.6'000 hectare producing 338.6' 000 mt. with productivity of 18.2 mt/ha. It is cultivated in almost all districts of Madhya Pradesh viz., Jabalpur, Satna, vidisha, Indore, Ratlam.

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 farming (Bahadur *et al.*, 2003) [2]. 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 formula (Reddy *et al.*, 2004) [3].

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

Results and discussion

The economics of all the treatments are given in Table 4.12. The net profit/ha ranged from Rs. 182392.68. (T_9) to Rs. 123469.25 (T_4) the maximum net profit/ha was recorded under T_9: (Rs. 182392.68). While minimum net profit/ha was obtained in T_4: (Rs. 123469.25). The gross profit/ha ranged from Rs. 146785.00 to Rs. 233690.00 The maximum gross profit/ha was recorded in T_9: (Rs. 230115.00). Where as minimum gross profit/ha was recorded in T_5: (Rs. 175000.00). Thus, the maximum income (both gross and net) was obtained with T_9 and the lowest income (both gross and net) was obtained with T_4: The benefit cost ratio ranged from 2.66 to 4.54 depending on different treatments. It was found to be highest (4.54) under the T1 and the lowest (2.66) under the T_4, The total cost of cultivation was maximum (Rs. 47789.8) under the treatment T_5. And significantly minimum total cost of cultivation are recorded (Rs. 38722.9) under the treatment T_1: 100 % RDF (Control).

Application of T_9: 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.

Table 1: Effect of Integrated Nutrient Management on economy 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 VC	41226.43	362.73	181365.00	140138.57	3.30
T_3 75: % RDF + 25 % N through FYM	43225.8	384.52	192260.00	149034.16	3.45
T_4 50: % RDF + 50 % N through VC	43790.8	334.52	167260.00	123469.25	2.82
$T_5$50: % RDF + 50 % N through FYM	47789.8	350.00	175000.00	127210.25	2.66
T_6 100: % RDF + 25% N through VC	47823.9	372.50	185000.00	147190.00	3.48
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 FYM + *Azotobacter* @ 2 kg ha^{-1}+ PSB @ 2 kg ha^{-1}	44722.3	411.90	205950.00	161227.68	3.61
T_9 100: % RDF + 25% N through VC + *Azotobacter* @ 2 kg ha^{-1}+PSB @ 2 kg ha^{-1}	47722.3	460.23	230115.00	182392.68	3.82

Much higher than that with chemical fertilizer. Similar results were also reported by Upadhyay, *et al.* (2015) [4].

References

1. Anonymous. Indian Horticulture Database, National Horticulture Board, Gurgaon, 2014.
2. Bahadur A, Singh, Singh KP. Response of cabbage to organic manure and biofertilizers. Indian Journal of Horticulture. 2003; 61:278-279.
3. Reddy SS, Ram PR, Sastry TVN, Devi IB. Agriculture Economics, 2004, 478.
4. Upadhyay AK, Singh J, Bahadur A, Singh VK, Singh SK. Impact of integrated nutrient management on yield, quality traits and economics of cabbage (*Brassica oleracea* L. var. *capitata*) Progressive Horticulture. 2015; (47):2249-5258.