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Effect of organic fertilizers and Bio: fertilizers on growth, yield and quality of cauliflower (*Brassica oleracea* L. Var. *Botrytis*)

Anil Thadani, Vijay Bahadur, Samir E Topno, Joy Dawson and T Thomas

Abstract
The present experiment was carried out during September to December 2018 in Departmental Research Field of Department of Horticulture, SHUATS, and Prayagraj. The experiment was conducted in Randomized Block Design (RBD), with three replication comprised of eleven treatments *viz.* T_0 (Control), T_1 {Rhizobium (100g/kg seed)}, T_2 {Rhizobium (100g/kg seed) + Compost (11t/ha), T_3 {Rhizobium (100g/kg seed) + Compost (11t/ha) + 75% RDF}, T_4 {Rhizobium (100g/kg seed) + Compost (11t/ha) + 100% RDF}, T_5 {Rhizobium (100g/kg seed) + PSB (120g/kg seed), T_6 {Rhizobium (100g/kg seed) + Compost (11t/ha) + PSB (120g/kg seed)}, T_7 {PSB (120g/kg seed)}, T_8 {PSB (120g/kg seed) + Compost (11t/ha)}, T_9 {PSB (120g/kg seed) + Compost (11t/ha) + 75% RDF }, T_{10} {PSB (120g/kg seed) + compost (11t/ha) + 100% RDF. The seedlings were transplanted at a spacing of 90 x 45 cm. From the findings; it is found that the treatment T_8 {PSB (120g/kg seed) + Compost (11t/ha)} was found superior over other treatments in terms of growth, yield and quality of Cauliflower with highest B: C ratio (1.83).

Keywords: Cauliflower, PSB, rhizobium and compost

Introduction
Cauliflower (*Brassica oleracea* L var. *botrytis*) is an important member of Cruciferae family. The name cauliflower consists of two Latin words namely 'caulis' means cabbage and 'floris' means flower. It is grown throughout the country for its tender curds which are used as vegetable, soup and for pickling (Choudhury *et al.*, 2004) [6]. The crop is reported to be a native of Southern Europe in the Mediterranean region and was introduced in India in 1822 from England (Chatterjee, 1986) [5]. Cauliflower has high protein and peculiar in stability of vitamin C after cooking (Singh, 1997) [19].

It is rich in minerals such as potassium, sodium, iron, phosphorus, calcium, magnesium etc. It also contains vitamin A (Singh, 1997) [19]. The popularity of the crop has been constantly increasing and now it occupies more area than other vegetables in certain parts of the world. In India cauliflower occupies an area of 4, 14,000 hectare with a production of 78, 97,000 metric tons (Department of Agriculture, GOI, 2017) [8].

The application of bio-fertilizers in vegetable crop has been found very effective for sustainable production of vegetables. Bio-fertilizers offer an economically attractive and ecologically sound means of reducing external inputs and improving quality and quantity of internal sources. These inputs contain microorganisms which are capable of mobilizing nutritive elements from non-usable form to usable form through different biological process. They are also less expensive, eco-friendly and sustainable; do not require non-renewable source of energy during their production and improve growth and quality of crops by producing plant hormones. Bio-fertilizers also increase the sustainability of the soil and make it more productive. Being bio-control agents, these control many plant pathogens and harmful microorganisms (Asokan *et al.*, 2000) [1].

Organic manures and bio-fertilizers are the important components of integrated nutrient management. Organic manures also supply the trace amounts of micronutrients which are generally not supplied by the farmers to their vegetable crops. The cmbined use of vermin-compost with inorganic fertilizers enhances utilization of nutrients by the soil microbial process (Lenin & Rangaswamy, 2002). Worm casts contain 5 times more N, 7 times more P and 11 times more K than ordinary soil, the main minerals needed for plant growth (Sharma and Agarwal, 2004).

Materials and Methods

The present investigation entitled "Effect of organic fertilizers and biofertilizers on growth, yield and quality of cauliflower (*Brassica oleracea* L. var. *botrytis*)" were carried out at Research Field of Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj (U.P.) in the year 2018-19 in Randomized Block Design (RBD) with 11 treatments. Total number of treatments were Eleven *viz.* T_0 (control), T_1 {rhizobium (100g/kg seed)}, T_2 {rhizobium (100g/kg seed) + compost (11t/ha), T_3 {rhizobium (100g/kg seed) + compost (11t/ha) + 75% RDF}, T_4 {rhizobium (100g/kg seed) + compost (11t/ha) + 100% RDF}, T_5 {rhizobium (100g/kg seed) + PSB (120g/kg seed), T_6 {rhizobium (100g/kg seed) + compost (11t/ha) + PSB (120g/kg seed)}, T_7 {PSB (120g/kg seed)}, T_8 {PSB (120g/kg seed) + compost (11t/ha)}, T_9 {PSB (120g/kg seed) + compost (11t/ha) + 75% RDF }, T_{10} {PSB (120g/kg seed) + compost (11t/ha) + 100% RDF were used.

The area of Prayagraj district comes under subtropical belt in the south east of Utter Pradesh, which experience extremely hot summer and fairly cold winter. The maximum temperature of the location reaches up to 46 ºC- 48 ºC and seldom falls as low as 4 ºC- 5 ºC. The relative humidity ranges between 20 to 94%. The average rainfall in this area is around 1013.4 mm annually. However, occasional precipitation is also not uncommon during winter months.

Results and Discussion

Statistical data on plant height, number of leaves, width of leaves, length of leaves, leaf area, girth of stem, diameter of curd, fresh weight of curd, yield per plot, yield per hectare, TSS, compactness, ascorbic acid and B-carotene of cauliflower are presented in table 1 & table 2.

Regarding plant height increasing pattern observed up to 60 days after transplanting. At every stage significant difference in plant height was noted at 30 days after transplanting, the highest plant height (27.43 cm) was recorded in control followed by T_1 (27.34 cm), T_2 (25.79 cm) and T_3 (23.73 cm), while the minimum plant height (18 cm) recorded in T_9. At 45 days after transplanting T_5 recorded with maximum plant height (47.89 cm) followed by T_1 (46.32 cm), T_2 (45.16 cm), and T_7 (43.93 cm) & the minimum plant height (36.11 cm) was recorded in T_9, similarly at 60 days after transplanting the maximum plant height (53.37 cm) was recorded in T_3 followed by control (52.6 cm), T_1 (52.5 cm) and T_8 (51.6 cm), whereas minimum plant height (48.53 cm) recorded in T_7. Rhizobium was significantly increased the N and K availability by 19.57 and 5.47 per cent over control due to increased nitrogen fixation with the Rhizobium inoculation so that plant height stimulated by the nutrients Meshram *et al.*, (2005) [11] and Dubey (1998) [9].

Number of leaves had not been same in increasing pattern where, at a different period of time different treatments showing their dominance. At 30 days after transplanting, the maximum number of leaves (8.25) was recorded in T_8 followed by T_6 (8.09), T_7 (7.53) and T_9 (7.4), while the minimum number of leaves (6.32) recorded in T_5. At 45 days after transplanting T_5 recorded with maximum number of leaves (15.94) followed by T_9 (15.51), control (14.99), and T_{10} (14.71) & the minimum number of leaves (12.76) was recorded in T_6, similarly at 60 days after transplanting the maximum number of leaves (24.37) was recorded in T_8 followed by control (22.43), T_7 (22.03) and T_9 (21.8), whereas minimum number of leaves (20.97) recorded in T_6. Phosphate solubilising bacteria (PSB) convert insoluble phosphorous into soluble phosphorous which help to intake more nutrients through roots and enhance in plant height, leaf length, leaf width, leaf weight per plant and curd diameter, similar result finding found by Verma and Yadav (2011) [22], Upadhyay *et al.* (2012) [21] and Choudhury *et al.* (2004) [6] in cauliflower and (Ranjeet and Ravi, 2004) [12] in broccoli.

Treatments which had PSB were showing more prominent result of leaf length. At 30 days after transplanting, the maximum length of leaves (17.63 cm) was recorded in control followed by T_7 (17.16 cm), T_9 (16.48 cm) and T_8 (16.35 cm), while the minimum length of leaves (13.66 cm) recorded in T_3 At 45 days after transplanting T_5 recorded with maximum length of leaves (33.2 cm) followed by T_2 (31.84 cm), T_8 (31.27 cm), and T_9 (30.3 cm) & the minimum length of leaves (26.25 cm) was recorded in T_6, similarly at 60 days after transplanting the maximum length of leaves (39.83 cm) was recorded in T_8 followed by T_3 (38.47 cm), T_9 (38 cm) and T_6 (35.73 cm), whereas minimum length of leaves (32.83 cm) recorded in T_5. Phosphate solubilising bacteria (PSB) convert insoluble phosphorous into soluble phosphorous which help to intake more nutrients through roots and enhance in plant height, leaf length, leaf width, leaf weight per plant and curd diameter, similar result finding found by Verma and Yadav (2011) [22], Upadhyay *et al.* (2012) [21] and Choudhury *et al.* (2004) [6] in cauliflower and (Ranjeet and Ravi, 2004) [12] in broccoli.

Treatments having Compost + PSB were better in width of leaves of cauliflower than others. At 30 days after transplanting, the maximum width of leaves (16.05 cm) was recorded in T_6 followed by T_7 (15.04 cm), control (15.01 cm) and T_9 (14.84), while the minimum width of leaves (11.83 cm) recorded in T_3. At 45 days after transplanting T_6 recorded with maximum width of leaves (21.61 cm) followed by T_7 (21.03 cm), control (21.03 cm), and T_9 (20.84 cm) & the minimum width of leaves (17.63 cm) was recorded in T_3, similarly at 60 days after transplanting the maximum width of leaves (23.27 cm) was recorded in T_6 followed by T_7 (22.57 cm), T_4 (22.19 cm), T_1 (21.93 cm), whereas minimum width of leaves (18.28 cm) recorded in T_3. Phosphate solubilising bacteria (PSB) convert insoluble phosphorous into soluble phosphorous which help to intake more nutrients through roots and enhance in plant height, leaf length, leaf width, leaf weight per plant and curd diameter, similar result finding found by Verma and Yadav (2011) [22], Upadhyay *et al.* (2012) [21] and Choudhury *et al.* (2004) [6] in cauliflower and (Ranjeet and Ravi, 2004) [12] in broccoli.

Leaf area at 30 days after transplanting, the maximum leaf area (187.79 cm^2) was recorded in T_7 followed by control (184.59 cm^2), T_8 (179.12 cm^2) and T_9 (178.51 cm^2), while the minimum leaf area (139.69 cm^2) recorded in T_3. At 45 days after transplanting T_3 recorded with maximum leaf area (458.35 cm^2) followed by T_9 (450.335 cm^2), control (443.888 cm^2), and T_2 (443.443 cm^2) & the minimum leaf area (370.048 cm^2) was recorded in T_4, similarly at 60 days after transplanting the maximum leaf area (582.802 cm^2) was recorded in T_6 followed by T_8 (571.167 cm^2), T_9 (554.748 cm^2) and T_4 (526.179 cm^2), whereas minimum leaf area (428.09 cm^2) recorded in T_5 Phosphate solubilising bacteria (PSB) convert insoluble phosphorous into soluble phosphorous which help to intake more nutrients through roots and enhance in plant height, leaf length, leaf width, leaf weight per plant and curd diameter, similar result finding found by Verma and Yadav (2011) [22], Upadhyay *et al.* (2012) [21] and Choudhury *et al.* (2004) [6] in cauliflower and (Ranjeet and Ravi, 2004) [12] in broccoli.

Stem girth was show minor difference between treatments which are par with each other and difficult to convey the best one. At 30 days after transplanting, the maximum girth of stem (2.81 cm) was recorded in T_4 followed by T_{10} (2.8 cm), T_9 (2.77 cm) and T_3 (2.53 cm) while the minimum girth of stem (1.64 cm) recorded in T_7. At 45 days after transplanting T_9 recorded with maximum girth of stem (4.52 cm) followed by T_3 (4.49 cm), T_7 (4.43 cm), and T_{10} (4.34 cm) & the minimum girth of stem (3.37 cm) was recorded in T_2, similarly at 60 days after transplanting the maximum girth of stem (5.53 cm) was recorded in control followed by T_5 (5.4 cm), T_9 (5.37 cm) and T_{10} (5.33 cm), whereas minimum girth of stem (4.93 cm) recorded in T_4. Bio-fertilizers enhance the availability of the nitrogen and phosphorus to plants and give rise better utilization of the nutrients by the plant which might have in turn promoted more root growth and development by higher nitrogen fixation in the soil. The increased uptake of nitrogen with biofertilizers helped in increasing photosynthetic area, chlorophyll content coupled with increased net photosynthetic rate and in turn increased supply of carbohydrates to the plants. The present findings are in close agreement with the earlier work done by Sable and Bhamare (2007) [13] in cauliflower.

The data verified that T_8 was recorded maximum diameter of curd, 15.53 cm followed by T_9 (15.33 cm), T_4 (13.27) and T_{10} (12.53 cm) & T_7 was recorded with minimum diameter of curd 10.97 cm. Phosphate solubilising bacteria (PSB) convert insoluble phosphorous into soluble phosphorous which help to intake more nutrients through roots and enhance in plant height, leaf length, leaf width, leaf weight per plant and curd diameter, similar result finding found by Verma and Yadav (2011) [22], Upadhyay *et al.* (2012) [21] and Choudhury *et al.* (2004) [6] in cauliflower and (Ranjeet and Ravi, 2004) [12] in broccoli.

Narrow difference among the fresh weight of cauliflower was noted in the present experiment. Treatment T_9 was recorded maximum fresh weight of curd, 0.70 kg followed by T_8 (0.66 kg), T_4 (0.57 kg) and T_7 (0.54 kg) & T_1 was recorded with minimum fresh weight of curd 0.34 kg. The maximum increase in all these quality parameters were observed with PSB inoculation, which might be due to improved nutrient availability in the root zone and solubilisation of the native phosphate status of the soil by PSB. Phosphorus solubilising bacteria enhances the availability of phosphorus to plants and gives rise to better utilization of nutrients by the crop which might have in turn greater root development, nodulation and higher N-fixation in the soil. Thus, the increase in availability of N and P might have resulted in greater content in broccoli head (Tanwar *et al.*, 2003; Sibbal *et al.*, 2003).

Yield per plot had effect by the application of levels of organic and bio-fertilizers on cauliflower. Treatment T_9 was recorded maximum yield per plot, 4.08 kg followed by T_4 (3.48 kg), T_2 (3.22 kg) and T_7 (3.14 kg) & T_6 was recorded with minimum yield per plot 2.46 kg. Nitrogen fixation bacteria + PSB might have improved both nitrogen and available phosphorus in Rhizosphere as they are free nitrogen fixation bacteria and phosphate solubilises, respectively. The combined inoculation of nitrogen fixation bacteria and PSB benefits plants more than either group of organisms alone Shrivastava and Ahalawat, (1995), Chalka (1999) [4], Khandelwal & Pareek (2007) [10] in broccoli.

Treatment T_9 was recorded maximum yield per hectare, 165.7 q/ha followed by T_4 (141.59 q/ha), T_8 (141.56 q/ha) and control (125.07 q/ha) & T_1 was recorded with minimum yield per hectare 97.22 q/ha. Nitrogen fixation bacteria + PSB might have improved both nitrogen and available phosphorus in Rhizosphere as they are free nitrogen fixation bacteria and phosphate solubilises, respectively. The combined inoculation of nitrogen fixation bacteria and PSB benefits plants more than either group of organisms alone Shrivastava and Ahalawat, (1995), Chalka (1999) [4], Khandelwal & Pareek (2007) [10] in broccoli.

T_8 was recorded significantly maximum B:C ratio, 1:1.83 followed by T_9, 1:1.8. T_1 was recorded with minimum B:C ratio, 0.54. T_9 was recorded significantly maximum net return, (55899.43 Rs. /ha) followed by T_8, (51665.54 Rs. /ha). T_1 was recorded with minimum net return, (14799.31 Rs. /ha). The maximum increase in all these quality parameters were observed with PSB inoculation, which might be due to improved nutrient availability in the root zone and solubilisation of the native phosphate status of the soil by PSB. Phosphorus solubilising bacteria enhances the availability of phosphorus to plants and gives rise to better utilization of nutrients by the crop which might have in turn greater root development, nodulation and higher N-fixation in the soil. Thus, the increase in availability of N and P might have resulted in greater content in broccoli head (Tanwar *et al.*, 2003; Sibbal *et al.*, 2003).

Data pertaining showed that phosphorous content increase T.S.S of cauliflower. Treatment T_{10} was recorded maximum T.S.S, 7.13 ^{0}B followed by T_9 (7.07 ^{0}B), T_3 (7.07 ^{0}B) and T_6 (-6.7 ^{0}B) & T_7 was recorded with minimum (5.73 ^{0}B) T.S.S. Nitrogen fixation bacteria + PSB might have improved both nitrogen and available phosphorus in Rhizosphere as they are free nitrogen fixation bacteria and phosphate solubilises, respectively. The combined inoculation of nitrogen fixation bacteria and PSB benefits plants more than either group of organisms alone Shrivastava and Ahalawat, (1995), Chalka (1999) [4], Khandelwal & Pareek (2007) [10] in broccoli and by Dass *et al.* (2005) [7] in pea.

The data reveals that treatment T_7 was recorded maximum compactness, 0.0421 followed by T_6 (0.0359), T_3 (0.0344) and T_2 (0.022) & T_8 was recorded with minimum compactness 0.0177 Nitrogen fixation bacteria + PSB might have improved both nitrogen and available phosphorus in Rhizosphere as they are free nitrogen fixation bacteria and phosphate solubilises, respectively. The combined inoculation of nitrogen fixation bacteria and PSB benefits plants more than either group of organisms alone Shrivastava and Ahalawat, (1995), Chalka (1999) [4], Khandelwal & Pareek (2007) [10] in broccoli and by Dass *et al.* (2005) [7] in pea.

The data reveals that treatment T_9 was recorded maximum ascorbic acid, 64.88 mg/100gm followed by T_5 (63.5 mg/100gm), T_4 (62.72 mg/100gm) and T_8 (62.61 mg/100gm) & control was recorded with minimum ascorbic acid 47.36 mg/100gm. Nitrogen fixation bacteria + PSB might have improved both nitrogen and available phosphorus in Rhizosphere as they are free nitrogen fixation bacteria and phosphate solubilises, respectively. The combined inoculation of nitrogen fixation bacteria and PSB benefits plants more than either group of organisms alone Shrivastava and Ahalawat, (1995), Chalka (1999) [4], Khandelwal & Pareek (2007) [10] in broccoli and by Dass *et al.* (2005) [7] in pea.

The data reveals that treatment T_6 was recorded maximum B-carotene, 27.82 µg/100gm followed by T_9 (27.14 µg/100gm), T_5 (26.57 µg/100gm) and T_3 (26.4 µg/100gm) & T_1 was recorded with minimum B-carotene 21.57 µg/100gm. Rhizobium was significantly increased the N and K availability by 19.57 and 5.47 per cent over control due to increased nitrogen fixation with the Rhizobium inoculation Meshram *et al.*, (2005) [11] and Dubey (1998) [9].

Table 1: Effects of Organic fertilizers and bio-fertilizers on Plant height (cm), Number of leaves/plant, Length of leaves (cm), Width of leaves (cm), Girth of stem (cm), Leaf area (cm^2) of Cauliflower (*Brassica oleracea L.* var. *botrytis*).

Treatments	Plant height (cm)			Number of leaves			Length of leaves (cm)			Width of Leaves (cm)			Girth of stem (cm)			Leaf Area (cm^2)		
	30 DAT	45 DAT	60 DAT	30 DAT	45 DAT	60 DAT	30 DAT	45 DAT	60 DAT	30 DAT	45 DAT	60 DAT	30 DAT	45 DAT	60 DAT	30 DAT	45 DAT	60 DAT
T0: Control	27.43	42.31	52.60	6.39	14.99	22.43	17.63	30.14	34.23	15.01	21.03	21.48	2.11	3.49	5.53	184.59	443.888	515.172
T1: Rhizobium (100g/Kg Seed)	27.34	46.32	52.50	7.23	14.34	21.70	16.31	29.94	34.07	13.69	19.67	21.93	2.34	3.62	5.27	173.87	412.159	523.34
T2: Rhizobium (100g/Kg Seed) + Compost (11t/Ha)	25.79	45.16	51.03	7.13	13.90	21.37	15.88	31.84	34.33	12.97	19.01	21.40	1.97	3.37	5.07	156.17	443.443	456.608
T3: Rhizobium (100g/Kg Seed) + Compost (11t/Ha) + 75% RDF	23.73	43.21	53.37	6.92	13.87	21.77	13.66	29.81	38.47	11.83	17.63	18.28	2.53	4.49	5.03	139.69	458.35	493.672
T4: Rhizobium (100g/Kg Seed) + Compost (11t/Ha) + 100% RDF	21.67	38.09	51.53	6.33	14.33	21.73	16.18	27.33	33.90	13.33	19.35	22.19	2.81	4.03	4.93	164.36	370.048	526.79
T5: Rhizobium (100g/Kg Seed) + PSB (120g/Kg Seed)	22.99	47.89	48.70	6.32	15.94	21.43	15.91	33.20	32.83	14.26	20.23	18.65	2.28	3.72	5.40	168.34	403.263	428.09
T6: Rhizobium (100g/Kg Seed)+ Compost (11t/Ha) + PSB (120g/Kg Seed)	20.29	39.77	49.17	8.09	12.76	20.97	15.72	26.25	35.73	16.05	21.61	23.27	2.29	4.04	5.33	169.48	363.608	582.802
T7: PSB (120g/Kg Seed)	20.81	43.93	48.53	7.53	13.94	22.03	17.16	27.74	35.40	15.04	21.03	22.57	1.64	4.43	5.27	187.79	438.584	522.079
T8: PSB (120g/Kg Seed) + Compost (11t/Ha)	19.97	42.11	51.60	8.25	13.90	24.37	16.35	31.27	39.83	13.42	19.37	20.52	2.46	4.12	5.03	179.12	424.144	571.167
T9: PSB (120g/Kg Seed) + Compost (11t/Ha) + 75%RDF	18.00	36.11	51.07	7.40	15.51	21.80	16.48	30.30	38.00	14.84	20.84	21.23	2.77	4.52	5.37	178.51	450.335	554.748
T10: PSB (120g/Kg Seed)+Compost (11t/Ha) + 100% RDF	21.75	39.15	49.40	6.61	14.71	21.73	15.81	28.64	33.30	14.75	20.67	21.03	2.80	4.34	5.33	172.28	414.487	489.792
F-test	s	s	s	s	s	S	s	s	s	s	s	s	s	s	s	s	s	s
S.EM+-	0.61516	1.55473	0.74596	0.2517	0.3937	0.4122	0.3860	0.8160	1.0660	0.4136	0.3925	0.7766	0.1083	0.1552	0.1282	7.0268	14.7526	26.0943
C.D. (5%)	1.81472	4.58644	2.20058	0.7427	1.1614	1.2158	1.1386	2.4073	3.1447	1.2200	1.1578	2.2911	0.3195	0.4577	0.3782	20.7290	43.5202	76.9782

Table 2: Effects of Organic fertilizers and bio-fertilizers on Ascorbic acid (mg/100g), T.S.S (^{0}B), B-carotene (µg/100g), Compactness, Curd diameter (cm), Fresh weight of curd (kg), Yield per hectare (q/ha) and Yield per plot (kg) of Cauliflower (*Brassica oleracea L.* var. *botrytis*).

symbols	Treatments	Ascorbic acid (mg/100g)	T.S.S (^{0}B)	β-carotene (µg/100g)	Compactness	Curd diameter (cm)	Fresh weight of curd (kg)	Yield per hectare (q/ha)	yield per plot (kg)
T0	Control	47.36	6.50	23.23	0.0310	11.95	0.52	125.07	2.61
T1	Rhizobium (100g/Kg Seed)	55.86	6.60	21.57	0.0249	11.10	0.34	97.22	2.98
T2	Rhizobium (100g/Kg Seed) + Compost (11t/Ha)	57.09	5.77	24.95	0.0332	11.63	0.49	117.37	3.22
T3	Rhizobium (100g/Kg Seed) + Compost (11t/Ha) + 75% RDF	58.40	7.07	26.40	0.0344	11.10	0.46	115.18	2.60
T4	Rhizobium (100g/Kg Seed) + Compost (11t/Ha) + 100% RDF	62.72	6.47	22.36	0.0258	13.27	0.57	141.59	3.48
T5	Rhizobium (100g/Kg Seed) + PSB (120g/Kg Seed)	63.50	6.03	26.57	0.0259	11.67	0.41	105.42	2.77
T6	Rhizobium (100g/Kg Seed) + Compost (11t/Ha) + PSB (120g/Kg Seed)	59.91	6.70	27.82	0.0359	11.17	0.47	116.10	2.46
T7	PSB (120g/Kg Seed)	54.64	5.73	23.24	0.0421	10.97	0.55	116.49	3.14
T8	PSB (120g/Kg Seed) + Compost (11t/Ha)	62.61	6.43	23.94	0.0177	15.53	0.66	141.56	3.04
T9	PSB (120g/Kg Seed) + Compost (11t/Ha) + 75%RDF	64.88	7.07	27.14	0.0195	15.33	0.70	165.70	4.08
T10	PSB (120g/Kg Seed) + Compost (11t/Ha) + 100% RDF	60.55	7.13	23.19	0.0246	12.53	0.49	110.44	3.11
F-test		s	S	s	s	s	s	S	s
S.EM+-		2.09	0.2227	0.7716	0.0047	0.4887	0.0405	5.1336	0.2428
C.D. (5%)		6.16	0.6569	2.2761	0.0140	1.4415	0.1194	15.1445	0.7162

Conclusion

On the basis of present experimental findings it is concluded that the treatment T_8 was found superior over other treatments followed by T_9 of cauliflower (*Brassica Oleracea* L. var. *botrytis*) cv. Mohini (local) was found better with different treatments of organic fertilizers and Bio-fertilizers, and lowest readings was recorded in T_1 under growth, yield and quality parameters.

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