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Yield and quality of brinjal (*Solanum melongena* L.) Cv. Puneri Kateri Influnced By organic and inorganic fertilizers

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Abstract: *The present investigation entitled "Effect of organic manures and inorganic fertilizers on growth, yield and quality of brinjal (Solanum melongena L.) Cv. Puneri Kateri was undertaken at Vasantrao Naik Marathwada Agricultural University, Parbhani (Maharashtra) in rabi season. The experiment was laid out in Randomised Block Design (RBD) with three replications and ten treatments. Puneri Kateri variety of brinjal was selected for present study. The material used in this experiment was three organic manures viz., poultry manure, sheep manure and F, sheep manure and FYM was incorporated in soil 15 days before sowing. Inorganic fertilizers used were urea, single super phosphate and muriate of potash. Recommended dose of fertilizer was 100:50:50 Kg NPK/ha.*

From the findings the yield and quality parameters like yield per plant, yield per plot and yield per hectare, ascorbic acid (mg/100 g) and T.S.S. (^{0}Brix) were influenced significantly due to different treatments.

The maximum yield per plant (2.14 kg), yield per plot (88.42 kg) and yield per hectare (39.29 t) was recorded in treatment (T_8) receiving75% RDF + 25% poultry manure. Minimum yield per plant, yield per plot and yield per hectare was obtained from the treatment T_1 (control).

The highest ascorbic acid content (15.27 mg/100 g) and T.S.S. (14.20^{0}Brix) were noticed in treatment T_8 (75% RDF + 25% poultry manure) which were significantly higher than all other treatments. The treatment T_1 (control) recorded minimum ascorbic acid content (11.53 mg/100 g) and T.S.S. (11.28^{0}Brix).

Key words: *Brinjal, Quality, Ascorbic acid, T.S.S., ^{0} Brix, Yield.*

INTRODUCTION

Brinjal (*Solanum melongena* L.) is a plant of the family solanaceae (also known as the night shades). It is also known as egg plant or aubergine due to its fruit shape that look like an egg. Brinjal is a stpale vegetable in our diet since ancient times and both poor and rich likes it. It is quite high in nutritive value and can be well compared with tomato (Choudhary, 1976). According to Bose and some (1986), the brinjal crop is susceptible to severe frost. A long and warm growing season with temperature range of 21-27 ^{o}C is most favourable for its successful production. It can be practically grown on all types of soil ranging from light sandy to heavy clay sandy soils are good for an early crop production while, silt loam or clay loam soils are good for maximum crop production. Generally well drained fertile sandy loam soils are preferred for brinjal cultivation. It can be grown on the alkaline soils but optimum pH range is 5.5 to 6.0 for its better growth and development, though soil with pH upto 7.5 are also found good.

According to Aykroyd (1963) chemical composition of brinjal (per 100 g of edible portion), consist of moisture (92.7 g), protein (1.4 g), fat (0.3 g), minerals (0.3 g), fibre (1.3 g), carbohydrate (4.0 g), calcium (18 mg), magnesium (16 mg), iron (0.9 mg), Vitamin A (124 I.U.), thiamine (0.04 mg) and Vitamin C (12.0 mg).

The unripe fruit of brinjal primarily used as cooked vegetable for the preparation of various dishes. It has got much potential as raw material in pickles making and dehydration industry. It is suppose to contain certain medicinal properties and white brinjal is said to be good for diabetic patients (Choudhary, 1976). It can also cure toothache and liver complains (Chouhan, 1981). It is also used for the treatment of bronchitis, asthma, dysentery, etc. it is also known for decreasing the level of blood

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cholesterol. Organically grown crops are believed to provide more healthy and nutritionally superior food for man. Mineral fertilizer decreases both the biological activity in soil, water and the environment causing their slow degradation but also affected the life of human beings (Kandeler and Eder, 1990). A lot of research work has been done on the effect of chemical fertilizers particularly nitrogen on brinjal crop. The literature of effect of organic manures particularly sheep manure, poultry manure, farm yard manure and inorganic fertilizers i.e. NPK in brinjal crop is very scanty.

An investigation was therefore conducted find out the influence of organic and inorganic on yield and quality brinjal cv. Puneri Kateri.

MATERIALS AND METHODS

The experiment was conducted at Marathwada Agricultural University, Parbhani, 431 402 (M.S.) during *rabi* season. The experiment was laid out in a randomized block design with ten treatments viz., T_1) 100% RDF (control) T_2) 75% RDF + 25% FYM T_3) 50% RDF + 50% FYM T_4) 25% RDF + 75% FYM T_5) 75% RDF + 25% sheep manure T_6) 50% RDF + 50% sheep manure T_7) 25% RDF + 75% sheep manure T_8) 75% RDF + 25% poultry manure T_9) 50% RDF + 50% poultry manure and T_{10}) 25% RDF + 75% poultry manure. The crop was raised at a spacing 60 cm x 60 cm with recommended dose of N, P and K viz., 100: 50: 50 kg/ha, respectively. Organic manures such as FYM, sheep manure and poultry manures were applied 10 days before transplanting. Nitrogen through urea were applied in two equal splits doses i.e. first at the time of transplanting and second 30 days after transplanting. Observations were recorded and statistically analyzed as per method given by Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

Effect on yield

Application of organic and inorganic fertilizers in combinations significantly influenced yield per plant, yield per plot and yield per hectare (Table 1) showed that total highest yield per plant and per plot (2.14 kg and 88.42 kg, respectively) were observed in the treatment T_8 (75% RDF + 25% poultry manure) and it was followed by T_9 (2.09 kg and 85.81 kg, respectively) (50% RDF + 50% poultry manure), which was significantly superior over remaining treatments. The lowest yield per plant was recorded in the treatment T_1 (control) (1.40 kg and 58.78 kg, respectively). Similarly, treatment T_8 (75% RDF + 25% poultry manure) produced maximum total yield per hectare (39.29 t) and was followed by T_9 (50% RDF + 50% poultry manure) (38.13 t) which was significantly superior over all remaining treatments. Similarly the treatments T_2 (33.59 t), T_3 (32.09 t), T_5 (36.32 t) and T_6 (32.63 t) which were statistically at par with each other. The treatments T_4 (27.95 t), T_7 (27.31 t) and T_{10} (28.39 t) was recorded minimum total yield per hectare. The treatment T_1 (control) produced (26.12 t), total yield per hectare which was significantly lower over all the treatments.

The increased yield per plant in treatment T_8 was due to large size and more number of fruits and weight of fruits Nanthakumar and Veeraragavathatham (1999) in brinjal. This also may be due to due to more number and large sized fruits as well as increased the synthesis of carbohydrate which ultimately promoted greater yield. It has been also reported that micro-organisms secrete hormones like IAA, cytokinin, auxins and GA3, which might have been another factor increasing the yield. The above results corroborates with Abusaleha and Shanmugavelu (1988), Kumaran (1988) and Devi *et al*. (2002).

Effect on quality

Nutritive value of the fruit is determined by the ascorbic acid content in the fruit. The highest ascorbic acid content (15.27 mg/100g) was noticed in treatment T_8 (75% RDF + 25% poultry manure) which was significantly higher than all other treatments. Similarly, the treatments, T_2, T_3, T_4, T_5, T_6, T_7, T_9 and T_{10} which were statistically at par with each other. The treatment T_1 (control) recorded minimum ascorbic acid content (11.53 mg/100 g).

It was observed that the fruits in treatment T_8 produced highest TSS (14.20) which was significantly superior than all the treatments except the treatment T_9 (13.88). Next better treatments for high TSS value of the fruits were T_2, T_3, T_5, T_6 and T_{10} which were statistically at par with each other. The treatments T_4 and T_7 was recorded minimum TSS of fruits. The lowest TSS of fruits was observed in the treatment T_1 (control) (11.28) as compared to all other treatments under study.

The increased T.S.S. content evidently showed that the stored food materials undergo either partial or complete hydrolysis and provide substrate for respiration. Being an essential component which might be involved in the respiratory process in the cell system and plant system, this could have naturally

Table 1
Effect of organic and inorganic fertilizers on yield and quality of brinjal Cv. Puneri Kateri.

Tr. No.	*Treatments*	*Yield/ plant (kg)*	*Yield/ plot (kg)*	*Yield/ ha (t)*	*Ascorbic acid (mg/ 100 g)*	*T.S.S. (°Brix)*
T_1	100% RDF (control)	1.40	58.78	26.12	11.53	11.28
T_2	75% RDF + 25 % FYM	1.83	75.60	33.59	11.82	13.65
T_3	50% RDF + 50 % FYM	1.73	72.22	32.09	11.74	13.13
T_4	25% RDF + 75 % FYM	1.52	62.89	27.95	11.67	12.75
T_5	75% RDF + 25 % sheep manure	1.96	81.74	36.32	12.88	13.70
T_6	50% RDF + 50 % sheep manure	1.78	73.44	32.63	11.80	13.50
T_7	25% RDF + 75 % sheep manure	1.48	61.47	27.31	11.63	12.10
T_8	75% RDF + 25% poultry manure	2.14	88.42	39.29	15.27	14.20
T_9	50% RDF + 50% poultry manure	2.09	85.81	38.13	13.96	13.88
T_{10}	25% RDF + 75% poultry manure	1.55	63.90	28.39	11.70	13.08
	S.E. ±	0.0041	0.083	0.036	0.178	0.063
	C.D. at 5%	0.0122	0.246	0.109	0.530	0.189

resulted in the conversion of reserved food material to soluble simple sugar. This may be the probable cause for the increase in T.S.S. content. Several other workers have also observed similar results it was supported by Mallick and Muthukrishan (1980) and Tamilselvi *et al.* (2005).

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