QUALITY ATTRIBUTES OF TOMATO GROWN ORGANICALLY ON KITCHEN WASTE MANURE

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Abstract :
In the present study a fruit class vegetable tomato was grown using vermicompost, normal soil & manure prepared from kitchen waste & was studied for its sensory characteristics. Recipe was formulated & evaluated. There trial (T1, T2 & T3) were conducted for testing of various sensory characteristics such as appearance, colour, texture, test, flavor & acceptability. For this purpose five human panelists were coded as T1,T2,T3, T4 & T5. Recipes were served fresh based on mean values results were tabulated & analyzed statistically by applying one way annova & scheff's test. It was observed that kitchen waste manure variety significantly scored maximum than normal soil vermicompost. It show highly significant difference in both varieties when compared on organoleptic characteristics. Thus it was concluded that kitchen waste manure was highly appreciated & more superior in all sensory characters over normal soil, which was statistically proved. Thus by using organic manure & vermicompost for growing vegetables, we can save our ecosystem & health by consuming these fresh organic vegetable.
Keyword : T1-T5 (Judges), Kitchen Waste Manure, Sensory Characteristics, Ecosystem.

Introduction:

The concept of organic farming is conceived differently by different people. It is generally said that organic farming is the practice of growing crops using only organic manures & not following the usual plant protection measures. Organic farming is defined as a production system which avoids fertilizers, pesticides growth regulars & live stock feed additive to the maximum extent feasible, organic farming relies on crop production, crop residues, animal manure, legumes, green manures, off farming, agricultural cultivation, mineral bearing rocks & aspects of biological pest control to maintain soil productivity & to supply plant nutrients & also to control insects seeds & other pests. According to Fantilamn (1990) organic farming is a matter of giving back to nature of the way back from it.

In our country, since centuries, organic manures were the primary sources of plant nutrients for crop growth & development. Recycling of organic waste & application of bulky organic manures were the most popular organic measures adopted to sustain soil health (Sehgal & Chauhan 2000).

To satisfy the ever increasing demand of food production to feed the increasing population. Indian agriculture research since 1960 focused its attention on increased productivity, high yielding varieties, fertilizer & pesticides along with irrigation. The chemical fertilizers played significant role in providing large quantities of nutrients needed for intensive crop production which brought about maintain increasing in aggriculatural production in the initial days. But its repeated use has led to degradation of soil health, pollution of ground water, salinity & soil biodiversity went down (Jackson 1967).

Due to above reasons organic farming is being practiced now-a-days, which involves the use of humus, cow dung, vermicompost & kitchen waste, that improves & maintains soil fertility.

Everyday we throw kitchen waste such as fruit & vegetable peels & leftover into a trash can. These kitchen wastes are full of nutrient that end up landfills to be never be reused again. However our yard can always use more nutrients so why not recycle our kitchen waste into our yard or vegetable garden.

Composting is natural process. Organic materials like vegetables scraps are broken down by microorganisms forming a rich soil like substances called compost. Vegetables scraps, grains, fruit peels, egg shells, bread & cereals are the best kitchen waste for composting.

Materials and Method:

All kitchen waste for contains rich nutrients which are totally wasted by throwing it in dustbin. The process of converting kitchen waste into organic manure is very simple, mostly done by nature with the help of micro-organisms. For that terrace of a house was selected for preparation of kitchen waste manure. All old cooler tank with holes on all sides to have a good oxygen

flow was used. Kitchen waste was collected daily at the end of the day. Next day collected waste was spread in tank with normal soil. Repeated the same till the tanks was full covered the tank with gunny bags. To maintain the optimum moisture level in the tank water was added. Kitchen waste manure was ready within 60-75 days. The pots were filled by kitchen waste manure 3:1 proportion & another 2 pots were filled by normal soil. The tomato sapling were inserted in the centre of the pot in the month of September & the tomatoes were ready in the month of December.

Sensory Evaluation :

It was on the basis of organoleptic characteristics of the tomato soup that was prepared using fresh tomatoes ploughed from the experimental pots grown on manure prepared from kitchen waste. After collection of 100 gm of tomato it was cleaned, washed, chopped & 200 ml water was added to it. It was cooked till soft, and then grounded in a mixture. The mixture was kept for boiling, salt was added, boiled for a minute & the hot soup was served to the judges. Same procedure was followed for tomatoes grown on normal soil. Score card was developed for the recipe on the basis of appearance, color, texture, taste, flavor, consistency & acceptability.

Statistical appraisal of the data was done using.

Arithmetic mean/average

One way annova test

Graphical representation

The purpose of the present study was comparative study of tomatoes grown in kitchen waste manure & normal soil. Tomato soup recipe was prepared & standardized & results were tabulated, analyzed & discussed under the following heads.

Preparation of kitchen waste manure by using household kitchen waste. Sensory characteristics of cooked vegetable.

Result and Discussion:

Table 1. Appearance of Tomato

Appearance	**K**	**V**	**C**
Mean score	9.866667	9.733333	8.4
Standard deviation	0.516398	0.593617	1.121224

ANOVA

Tomato Appearance				
ANOVA				
Sources of variation	df	ss	mss	F
Between fertilizer	2	19.73333	9.866667	15.77665
within groups	42	26.26667	0.625397	($p<0.01$)
Total	44			

Appearance is the first appraisal of the food. Eye appeal is gained through contrasting & interesting combination of foods differing in types of colour & form. The above table shows that the calculated value of F is 15.77665 which is greater than the table value of 3.15 is at 5% level with df being v1=2 and v2=42 and hence which support alternative hypothesis it means there difference in sample means. We may therefore conclude that there is significant difference between appearance due to varieties of manures.

The first impression we get of food is formed by its color. Color is used as an index to the quality of number of foods.

Table 2. Color of Tomato

Color	**K**	**V**	**C**
Mean score	9.87	9.60	8.47
Standard deviation	0.52	0.74	0.83

ANOVA

Tomato Color				
ANOVA				
Sources of variation	df	ss	mss	F
Between fertilizer	2	16.57778	8.288889	16.52532
within groups	42	21.06667	0.501587	(p<0.01)
Total	44			

Colour is an important factor that regulates overall appearance of the product. The above table shows that the calculated value of F is 16.52532 which is greater than the table value of 3.15 is at 5% level with d.f. being v1=2 and v2=42 and hence which support alternative hypothesis it means there difference in sample means. We may therefore conclude that there is significant difference between color due to varieties of manures.

Table 3. Consistency / texture of Tomato

Consistency/Texture	**K**	**V**	**C**
Mean score	9.07	9.13	7.80
Standard deviation	0.96	1.25	0.94

ANOVA

Consistency/Texture				
ANOVA				
Sources of variation	df	ss	mss	F
Between fertilizer	2	16.93333	8.466667	7.555241
within groups	42	47.06667	1.120635	(p<0.01)
Total	44			

Consistency may be considered a textural quality attribute. The above table shows that the calculated value of F is 7.555241which is greater than the table value of 3.15 is at 5% level with d.f. being v1=2 and v2=42 and hence which support alternative hypothesis it means there difference in sample means. We may therefore conclude that there is significant difference between consistency due to varieties of manures.

Table 4. Taste of Tomato

Taste	K	V	C
Mean score	9.00	8.60	7.53
Standard deviation	0.93	0.83	0.64

ANOVA

Tomato Taste				
ANOVA				
Sources of variation	Df	ss	mss	F
Between fertilizer	2	17.24444	8.622222	13.24878
within groups	42	27.33333	0.650794	(p<0.01)
Total	44			

Taste plays very dominating role in food acceptability. The above table shows that the calculated value of F is 13.24878which is greater than the table value

of 3.15 at 5% level with d.f. being v1=2 and v2=42 and hence which support alternative hypothesis it means there difference in sample means. We may therefore conclude that there is significant difference between taste due to varieties of manures.

Table 5. Flavor of Tomato

Flavor	**K**	**V**	**C**
Mean score	9.60	8.80	8.07
Standard deviation	0.83	1.21	1.53

ANOVA

Tomato Flavor				
ANOVA				
Sources of variation	df	ss	mss	F
Between fertilizer	2	17.64444	8.822222	5.887712
within groups	42	62.93333	1.498413	(p<0.01)
Total	44			

Flavor depends on taste, odour or aroma temperature sensation of hot & cold texture. Flavour is the result of a number of components, some of which may be present in a high proportion but most are in high proportion but most are present in low proportion. The above table shows that the calculated value of F is 5.887712 which is greater than the table value of 3.15 is at 5% level with df being v1=2 and v2=42 and hence which support alternative hypothesis it means there difference in sample means. We may therefore conclude that there is significant difference between flavor due to varieties of manure.

Table 6. Acceptability of Tomato

Acceptability	**K**	**V**	**C**
Mean score	9.47	9.20	7.93
Standard deviation	0.74	0.86	0.80

ANOVA

Tomato Acceptability				
ANOVA				
Sources of variation	df	ss	mss	F
Between fertilizer	2	20.13333	10.06667	15.62069
within groups	42	27.06667	0.644444	(p<0.01)
Total	44			

The term acceptability or unacceptability is used to described whether the product is liked or disliked by the consumer. Exterior part plays an important role for acceptability. The above table shows that the calculated value of F is 15.62069 which is greater than the table value of 3.15 is at 5% level with df being v1=2 and v2=42 and hence which support alternative hypothesis it means there difference in sample means. We may therefore conclude that there is significant difference between acceptability due to varieties of manure.

Fig. 1 Appearance of Tomato

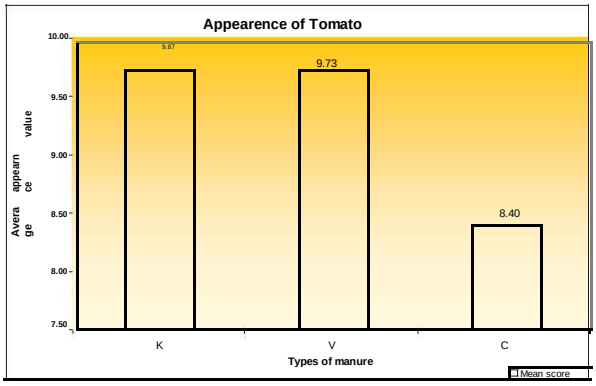


Fig. 2 Color of Tomato

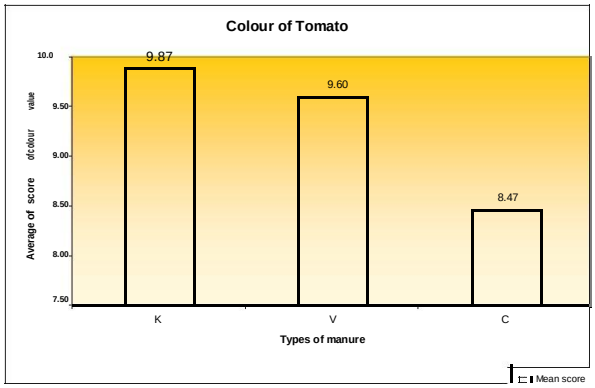


Fig. 3. Consistency / texture of Tomato

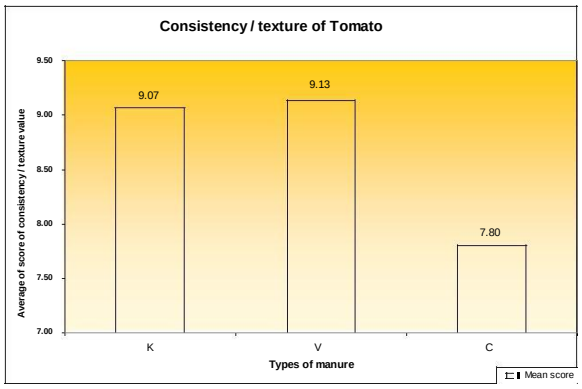


Fig. 4 Taste of Tomato

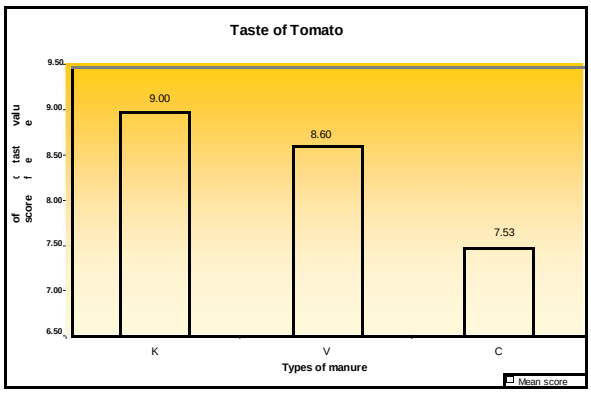


Fig. 5 Flavor of Tomato

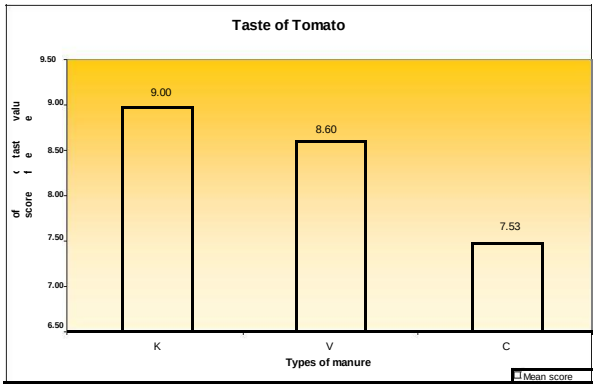
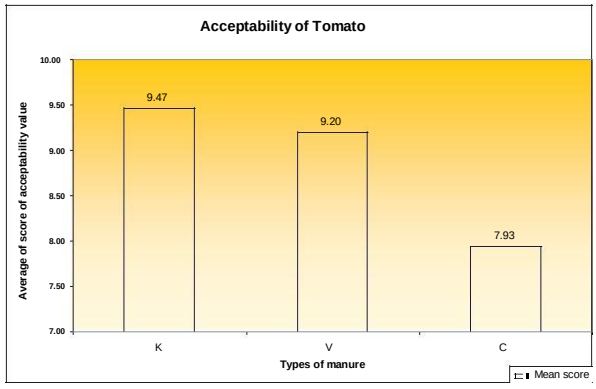


Fig. 6 Acceptability of Tomato



Conclusion:

Thus, it can be concluded that when compared on the organoleptic characteristics kitchen waste manure variety had been appreciated more than the other variety. Thus, it showed that kitchen waste manure was more superior over other variety which was statistically proved. Kitchen waste manure can be prepared from household and kitchen waste by housewives at household level, which is also called as organic manure. Use of this manure for farming is known as organic farming. Organic farming is eco-friendly and also enhances the quality of soil. It helps in increasing the productivity. It keeps the environment clean and balanced. Fruits and vegetables grown on this compost are healthy, highly nutritious and no harmful residues are left in the soil waster and in crop. At the same time original colour, texture, flavor and taste are retained. Artificially cultivated vegetables requires lots of chemical fertilizers and pesticides. These chemicals get accumulated in vegetables, fruits, soil and water. If these fruits and vegetable are not washed properly they remain in the food and cause ill effects on human body. Thus, by using organic manure for farming, we can save our ecosystem and health by consuming these vegetables.

The technology of utilizing household waste and kitchen waste for preparation of compost need to be popularized among the community at the household level. By doing so, we can save our environment from pollution, money, energy and time. For this purpose, extensive training is required to be provided to the farming community of the entire state. This technique can also be popularized among common masses by organizing exhibitions, demonstrations and other such activities.

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