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Study on nutrient level of compost produce by farm women of Gonda district using kitchen food waste material

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Abstract
In this experiment kitchen based compost to improve soil health and produce high impact of organic vegetables, both years 2017-18 and 2018-19 summer season kitchen waste composting contain primary nutrient NPK is 1.523, 0.540 and 0.717 percent respectively. Secondary element like Ca, Mg and S contain 5.537 mg/kg, 0.130 ppm and 16.48 ppm respectively. Other microelement like Zinc (Zn), Copper (Cu), Iron (Fe), Manganese (Mn), Boron (Bo) and Molybdenum (Mo) were contain 0.097, 0.003, 0.589, 0.121, 0.550 and 0.543 ppm respectively and winter season kitchen waste composting contain primary nutrient NPK is 1.353, 0.513 and 0.707 percent respectively. Secondary element like Ca, Mg and S contain 5.227 mg/kg, 0.130 ppm and 14.46 ppm respectively. Other microelement like Zinc (Zn), Copper (Cu), Iron (Fe), Manganese (Mn), Boron (Bo) and Molybdenum (Mo) were contain 0.120, 0.003, 0.589, 0.121, 0.550 and 0.543 ppm respectively. The pooled data also represent according in both years in summer season high contain essential element in kitchen waste materials.

Keywords: Kitchen wastes, essential element, macro nutrient, micro nutrient

Introduction
Today, farmer most important occupation is agriculture and also prepares some product like Vermicompost, organic food, making bamboo and sugarcane products like jaggery, vinegar, brown sugar etc. In India, Vegetables are grown since thousands of years but presently it has become an important enterprise at national and international level. Presently, the vegetable now become a necessary requirement of the daily diet, because of its nutritional value high by Arya *et al*. (2018) [1]. Daily uses of vegetables provide us most of the essential health building and protecting substances, such as vitamins and minerals. In India, where vegetarian has been a way of life since the early days of recorded history, the problem are under nutrition and malnutrition can only be solved through stable diet for which vegetables are essential component of the regular diet. Food wastes are three types 1. Avoidable waste: in India up to 64 percent food and drink waste is avoidable, 2. Possibly avoidable waste: some person can be eat food and drink that some people are do not like e.g. bread crusts, other can be eaten when prepared in one way but not in another like potato skins, up to 18% of food and drink waste is possibly avoidable. 3. Unavoidable waste: some foods and drinks preparation that is not, and has not been, edible under normal conditions like pineapple skin, apple cores, meat bones, tea bags, and coffee grounds etc. Organic waste is biodegradable materials comes from plant and animals and usually broken down by micro organism, insects etc. it's made up of excess kitchen foods, vegetable and fruit parts, papers, bone and human waste materials, that quickly decomposed. Organic materials are valuable by products, of farming allied industries, derived from plant and animal source. Organic manure supply nutrients, improves physical structure, increase nutrient content and provide food for soil organism. Baldi *et al*., (2021) [2]. The use of organic manure could be adopted by farm women. Ebele *et al*. (2021) [3]
Plant required 108 nutrients but mainly 12 element deficiency is more. According this things clarify in 5 types like basic nutrient (carbon, hydrogen and oxygen), primary nutrient (nitrogen, phosphorus and potassium), secondary nutrient (calcium, magnesium and sulphur), micro nutrient (Iron, Boron, Manganese, Zinc, Molybdenum, Copper) and beneficial nutrient (sodium, silicon, cobalt and selenium). Zinc is an essential element for all plants, and its significance is more and more being recognized in agriculture for crop production Islam and Mustaquim (2014); Nath G. and Singh (2012) [4, 5]

Objective of the study

Eco-friendly non-conventional bioorganic manure represents a special point of view for introduction to agro-production based on kitchen based compost to improve soil health and produce organic vegetables.

Materials and Methods

In the experimental trail conducted in year 2017-18 and 2018-19 at randomly selected farm women in 8 panchayat in 240 respondents, each Panchyt selected 30 farm women of Gonda district (Table 1) to produce vegetable production for marketing or self used at kitchen garden. Before trail to contact farm women and tell about kitchen based organic material for decomposition and produce organic manure like compost manure (Table-2). Collection of kitchen based data will be collected two season summer and winter in year 2017-18**.** The creation of a large compost pile located outdoors of farm women, process of composting were 1. Dig the hole for your compost pit 6 ×6×1 feet, 2. Start with browns on the bottom, alternate layers of brown and green materials, moistening as you build and 3. Cover with 4 to 8 inches (10 to 20 centimeters) of soil. The method and procedure for obtaining decompose kitchen based manure to the purpose of sampling. The result of even very carefully conduct analysis of samples. It varies season to season and type of kitchen based. Only one to ten gram of sample used for each chemical determination. The bag use for sampling must always clean and free from any contamination, pour the sample from the bucket on a piece of clean paper or cloth and mix thoroughly. Spread the composted sample evenly and divide in to a 4 quarter. Rejected to opposite quarters and mix the rest of sample again. Repeat the process till left with about half (1/2) kg of sample, collect it and put in a clean cloth bag. Each bag should be properly marked with permanent marker. Sample should be checked and entered a register and each sample give a proper laboratory number, in addition to sample number, which help to distinguish, if more than one source of sample involved. These should be dried in wooden or enameled trays. Care should be taken to maintain the identity of each sample at all stages of preparation. During drying, the trays can be numbered or a plastic tag could be attached. The manure are allowed to dry in the air. Alternatively, the trays may be placed in racks in a hot air cabinet whose temperature should not exceed 35 °C and relative humidity should be between 30 and 60%. After drying, the samples are taken to the preparation room which is separate from the main laboratory. Air dried samples are ground with a wooden pestle and mortar so that the soil aggregate are crushed but the soil particles do not break down. Samples of heavy clay soils may have to be ground with an end runner grinding mill fitted with a pestle of hard wood and rubber lining to the mortar. Pebbles, concretions and stones should not be broken during grinding. After grinding, the sample is screened through a 2 mm sieve. The practice of passing only a portion of the ground sample through the sieve and discarding the remainder is erroneous. This introduces positive bias in the sample as the rejected part may include soil elements with differential fertility. The entire sample should, therefore, be passed through the sieve except for concretions and pebbles of more than 2 mm. The coarse portion on the sieve should be returned to the mortar for further grinding. Repeat sieving and grinding till all aggregate particles are fine enough to pass the sieve and only pebbles, organic residues and concretions remain out. If the sample is to be analyzed for trace elements, containers made of copper, zinc and brass must be avoided during grinding and handling. Sieves of different sizes can be obtained in stainless steel.

Later than the sample is passed through the sieve, it must be again mixed thoroughly. The soil samples should be stored in cardboard boxes in wooden drawers. These boxes should be numbered and arranged in rows in the wooden drawers, which are in turn fitted in a cabinet in the sample room.

In this experiment to estimate of 6 (Six) Macro Nutrient like Nitrogen (N), Phosphorus (P), Potash (K), Calcium (Ca), Magnesium (Mg), Sulphur (S) and 6 (Six) Micronutrients like Iron (Fe), Boron (Bo), Manganese (Mn), Zinc (Zn), Molybdenum (Mo), Copper (Cu)

Method of nutrient estimation

Kitchen based organic material for decomposition and produce organic manure like compost manure using methods i.e., Total Nitrogen estimated by Kjeldahl Method, Available Phosphorus most commonly used for determination of available phosphorus Olsen's Method, Available Potassium estimated by Flame photometric method. Toth and Prince (1949) [6], Available sulphur occurs mainly as adsorbed SO_4 ions. SO_4 in the extract can be estimated turbidimetrically using a spectrophotometer. Determination of exchangeable Calcium and Magnesium estimated by EDTA titration method developed by Chang and Bray (1951) [7]. Calcium by Versenate (EDTA) method. For estimation of micronutrients also, it is the plant available form which is critical and not the total content. Most commonly studied micronutrients are Zn, Cu, Fe, Mn, B and Mo and the same have been dealt with here. The estimation of elements in the extract is done with the help of Atomic Absorption Spectrophotometer (AAS). Critical limits for DTPA extractable micronutrient elements as proposed by Lindsay and Norvell (1978) [8]. Available B is hot water extraction of soil as developed by Berger and Truog (1939) [9]. Molybdenum (Mo) is a rare element in found in organic waste and is present only in very small amounts. The major inorganic source of Mo is molybdenite (MoS_2).

Results and Discussion

In the present investigation used of kitchen based organic material after composting, have rich source of primary, secondary and micro nutrient they contain Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), Magnesium (Mg), Sulphur (S), Zinc (Zn), Copper (Cu), Iron (Fe), Manganese (Mn), Boron (Bo) and Molybdenum (Mo). The experiment conduct in year 2017-18 and 2018-19 summer and winter season in each year.

The result presented in Table 3, also show that out of the total Knowledge about eco-friendly management practices uses by vegetable growing farm women, apply in field kitchen based composting to obtain more yield of vegetable crops because soil texture have improve.

The Experiment in both year 2017-18 and 2018-19 summer season kitchen waste composting contain primary nutrient NPK is 1.523, 0.540 and 0.717 percent respectively. Secondary element like Ca, Mg and S contain 5.537 mg/kg, 0.130 ppm and 16.48 ppm respectively. Other microelement like Zinc (Zn), Copper (Cu), Iron (Fe), Manganese (Mn), Boron (Bo) and Molybdenum (Mo) were contain 0.097, 0.003, 0.589, 0.121, 0.550 and 0.543 ppm respectively. In both year 2017-18 and 2018-19 winter season kitchen waste composting contain primary nutrient NPK is 1.353, 0.513 and 0.707 percent respectively. Secondary element like Ca, Mg

and S contain 5.227 mg/kg, 0.130 ppm and 14.46 ppm respectively. Other microelement like Zinc (Zn), Copper (Cu), Iron (Fe), Manganese (Mn), Boron (Bo) and Molybdenum (Mo) were contain 0.120, 0.003, 0.589, 0.121, 0.550 and 0.543 ppm respectively. In both year pooled data winter as well as summer season kitchen waste composting contain primary nutrient NPK is 1.432, 0.527 and 0.712 percent respectively. Secondary element like Ca, Mg and S contain 5.382 mg/kg, 0.130 ppm and 15.470 ppm respectively. Other microelement like Zinc (Zn), Copper (Cu), Iron (Fe), Manganese (Mn), Boron (Bo) and Molybdenum (Mo) were contain 0.109, 0.003, 0.589, 0.121, 0.550 and 0.543 ppm respectively. The pooled data also represent according in both years in summer season high contain essential element in kitchen waste materials this data was also supported by Nguyen *et al*., (2020); Roy *et al*., (2013); Sinha *et al*., (2010); Srivastava A. (2023) and Tanwir *et al*. (2006) [10, 11, 12, 13, 14].

Table 1: Studies on macro and micronutrient based on Kitchen waste Food materials in year 2017-18 and 2018-19.

S. No.	Gram Panchayat	Number of Respondent	Total number of respondent
1	Alanpurgrint	30	240
2	Amava	30	
3	Amghati	30	
4	Ashrafpur	30	
5	Ballipur	30	
6	Banjaria,	30	
7	Mishrauliya	30	
8	Tezpur	30	

Table 2: Most commonly Fruits, vegetable and food use in kitchen waste for composting.

S. No.	Month	Most commonly Fruits/ food availability in kitchen
1	January	Apples, Cauliflower, Cabbage, Onions, Potatoes, Turnips, grains, pulses etc
2	February	Cabbage, Carrots, Onions, Potatoes, Turnips, grains, pulses etc
3	March	Apples, Orange, Cabbage, Carrots, Onions, Potatoes, grains, pulses etc
4	April	Carrots, Herbs, Onions, Potatoes, Tomato, grains, pulses etc
5	May	Asparagus, Cabbage, Garlic, Onions, Potatoes, Tomatoes grains, pulses etc
6	June	Mango, Cabbage, Okra, Garlic, Onions, Potatoes, Spinach, grains, pulses etc
7	July	Asparagus, Cabbage, Okra, Potatoes, Radishes, Tomatoes grains, pulses etc
8	August	Cabbage, Potatoes, Radishes, Okra, Spinach Tomatoes, grains, pulses etc
9	September	Orange, Cabbage, Potatoes, Radishes, Spinach Tomatoes grains, pulses etc
10	October	Orange, Cabbage, Garlic, Potatoes, Spinach, Tomatoes, grains, pulses etc
11	November	Cabbage, Garlic, Pea, Potatoes, Tomatoes, grains, pulses etc
12	December	Apples, Cauliflower, Cabbage, Pea, Potatoes, Turnips, grains, pulses etc

Table 3: Studies on macro and micronutrient based on Kitchen waste Food materials in year 2017-18 and 2018-19.

S. No.	Nutrient composition	Unit	Summer (2017-18 and 2018-19)	Winter (2017-18 and 2018-19)	Pooled
1	Nitrogen	%	1.510	1.353	1.432
2	Phosphorus	%	0.540	0.513	0.527
3	Potassium	%	0.717	0.707	0.712
4	Calcium	Mg/kg	5.537	5.227	5.382
5	Magnesium	Ppm	0.130	0.130	0.130
6	Sulphur	Ppm	16.480	14.460	15.470
7	Zinc	Ppm	0.097	0.120	0.109
8	Copper	Ppm	0.003	0.003	0.003
9	Iron	Ppm	0.589	0.589	0.589
10	Manganese	Ppm	0.121	0.121	0.121
11	Boron	Ppm	0.550	0.550	0.550
12	Molybdenum	Ppm	0.543	0.543	0.543

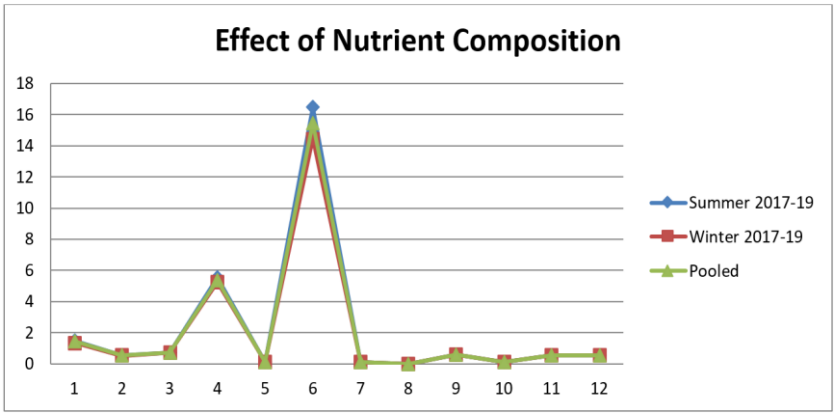

Fig 1: Effect of Kitchen waste Food materials content macro and micronutrient in year 2017-18 and 2018-19.

Summary and Conclusion

In this studies eco-farming utilize mainly resource fully the usual practices of crop rotation with legumes, tillage practices to improve soil health like soil texture, application of adequate organic matter to sustain, retain and release soil moisture, nutrient to match crop needs and correlation factors of soil poorly healthy. There were hardly many research studies, which have attempted to investigate the knowledge of farm women about the kitchen waste food management practices. The result pooled data also represent according in both years in summer season high contain essential element in kitchen waste materials.

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