

# Conversion of Bio-Degradable Waste as Manure for Terrace Garden

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**Abstract:** *As societies become more affluent and urbanized, communities will get congested and there by disposal of wastes especially bio- degradable are more problematic as they are dumped in streets which leads to negative impact on human health and environment. These bio - degradable waste can be converted as manure for the terrace garden to grow vegetables which will reduce the immediate household needs. Terrace gardening not only gives some space back to agriculture but also help the households to get chemical free fresh vegetables and fruits.*

**Keywords:** Affluent, Bio-degradable waste, Chemical-free, Manure, Negative impact

## 1. Introduction

"The world has genetically modified opinions but mine are organic.

Taste them and you will see." - Jarod Kintz.

Growing awareness of health and environmental issues in agriculture has demanded production of organic food which is emerging as an attractive source of income generation. Vegetables growing these days have become an economic activity or a business. Organic products are grown under a system of farming without the use of chemical fertilizers and pesticides with an environmentally and socially responsible approach. This is a method of farming that works at grass root level preserving the reproduction and regenerative capacity of the soil, good plant nutrition and sound soil management produces nutritious food rich in vitality which has resistance to diseases (Thiripurasundari2015). There is danger of consuming pesticides and other agro chemicals when vegetables bought from the market. In order to obtain higher income the cultivators use excessive chemical fertilizers and pesticides. Most of the cultivators are unable to calculate the exact amount of fertilizers and pesticides, simply apply them thinking more the fertilizer better the quality. As a result most vegetables sold in the market are containing the poisonous substances. Whereas home grown vegetables in terrace will be free from such chemicals.

One can easily recycle all the bio-degradable waste into organic manure for growing vegetables. Normally these wastes are thrown around the house or on the road polluting very badly the environment and encouraging breeding of mosquitoes and flies. Whereas if all these wastes are converted as manure for terrace vegetable garden one can easily imagine the clean and healthy environment ([www.organic-vegetable-garden-at-home.com](http://www.organic-vegetable-garden-at-home.com)).

## 2. Objectives of the Study

Realizing the significance of recycling bio-degradable waste and its application for terrace garden which is more relevant

to the present situation, this study is taken up with the following objectives;

- 1) To conduct a household survey to find the interested respondents.
- 2) To carry out an experimental study (investigator) to assess the quality of the standardized pot mix.
- 3) To analyze the growth of vegetables and greens using these pot mix.
- 4) To organize the training for selected respondents in rural and urban areas.

## 3. Materials and Methods

The method followed for this study consisted of household survey, training programme, experimental study of pot mix and to find the growth analysis of greens and vegetables in terrace garden.

### 3.1. Household survey and training

A total of 700 respondents representing 500 urban and 200 rural belonging to Salem district was selected for household survey. Survey was conducted using a pre-structured interview schedule. Based on the information collected from household survey a training module was framed to impart training for five days emphasizing the need for recycling bio-degradable waste for manure preparation and its utilization for organic terrace garden. The methods used to motivate the participants include field visit to Krishi Vigyan Kendra, forums, lecture, demonstration, pamphlets distribution and exhibition.

### 3.2. Experimental Study

An experimental study was done by the investigator on different methods on preparing manure using bio-degradable waste. This manure provides organic formula that improves physical, chemical and biological properties. Among the bio-degradable waste, animal manure, crop residues, household kitchen waste plays a crucial role in organic system. The compost made from bio-degradable waste is a

valuable resource which completes the nutrient cycle and provides nitrogen to the growth of the plants and also aims to improve the biological, physical/chemical properties of the soil and it is beneficial as a source of energy and nutrients for the soil eco system. They also contributes more nutrients to the soil and helps to modify the physical condition of soil by improving water holding capacity, aeration, drainage friability and the darker color of organic matter. (Viswanath 2014).

Experiment is carried out by the researcher keeping in mind the above mentioned benefits.

### Experiment 1

The procedure for the preparation of potting mix is to collect the peels of vegetables and fruits, tea and coffee extracts, egg shells and other bio-degradable waste materials. Collect these waste daily in a 3\*4 feet plastic bucket. Once the bucket is filled with waste, 250 gram of cow dung is diluted with ½ liter water and poured out the collected waste. A thin cotton cloth is tied around the bucket kept under shade. After 35 days, shake the bucket to make the content mix well. A very dark, clumsy manure will be ready and use the prepared manure directly for terrace garden.

### Experiment 2

To reduce the number of days for the preparation of pot mix and also the emission of carbon content from the bio-degradable waste with moisture, the recommendation given by Dr. S. Shanugasundaram, Environment scientist, Tami Nadu Agriculture University, Coimbatore and Mr. T. G. Muthu, Consultant Herbal terrace garden, Salem. In the second method the household waste was collected, dried and mixed with other ingredients farm yard manure, coco peat, ash and neem cake were added. In these method the drying capacity depends upon the intensity of the heat ranging from 2 to 5 days. In the second method the manure is prepared by with in a short period which can be applied whenever required.

Based on the suggestions by First Doctoral Committee experts, standardized pot mix recommended by agricultural

scientists were used for the cultivation of vegetables in terrace. The first method is practiced by T. G. Muthu, Agriculture scientist and Consultant, Herbal terrace garden, Salem. The second method is followed by Dr. B. N. Viswanath Kadur, Professor of Entomology, Pioneer and father of terrace garden. The ingredients used in two different potting mix is shown below:

Pot Mix 1		Pot Mix – 2	
Coirpith	30%	Coirpith	25%
Compostekitchen waste	30%	Compostekitchen waste	25%
Farm yard manure	30%	Farm yard manure	25%
Ash	10%	Red soil	25%

The investigator applied these two potting mix for growing vegetables and greens in terrace as a comparative study. The first three ingredients used for potting mix were common except red soil and ash. The four ingredients were taken in the given ratio along with 20 grams of neem cake, mixed well and filled in the grow bag of 1\*1feet size. The seeds and seedlings of selected greens and vegetables were sown and the growth of plants was checked once in 10 days regularly.

### 3.3 Growth analysis of greens and vegetables.

The experiment is carried out based on the two standardized potting mix for which the same type of vegetables and greens were used. The native vegetables and greens of Salem district were selected initially for experimental purpose such as;

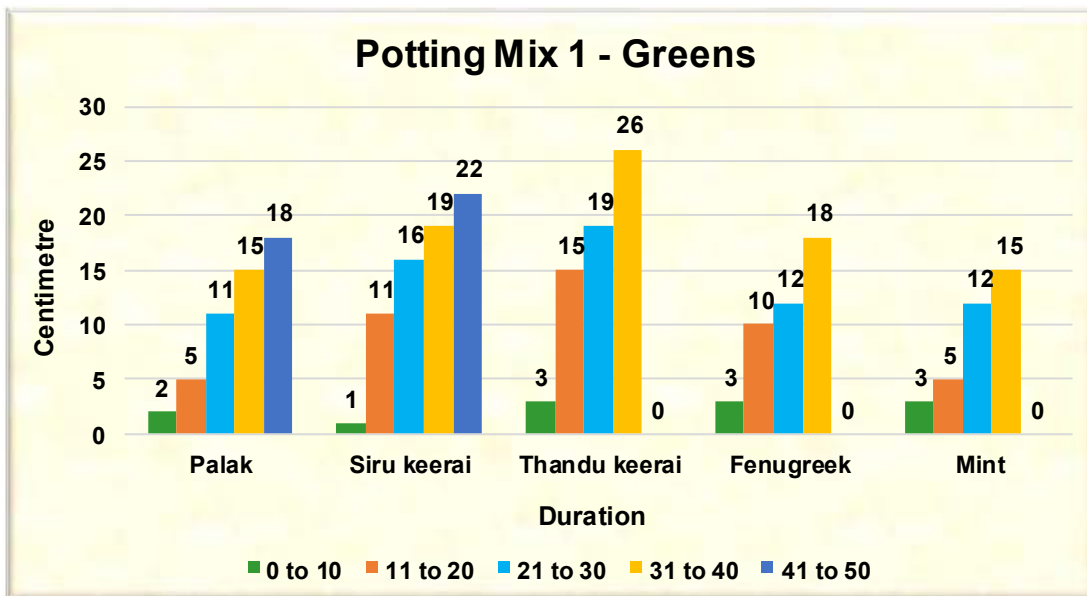
- Vegetables: Tomato, Chilli, Brinjal, Ladies finger, Bitter guard.
- Greens: Palak, Sirukeerai, Mint, Thandukeerai, Fenugreek.

The growth of vegetables and greens was recorded once in 10 days using the measuring tape.

The growth rate of greens cultivated in terrace garden is given below in table 1 and

**Table 1: Growth Rate of Greens in Potting Mix 1 and 2**

S.No	Duration	Growth rate of greens (cm)									
		Palak		Sirukeerai		Thandukeerai		Fenugreek		Mint	
		*P-1	*P-2	P-1	P-2	P-1	P-2	P-1	P-2	P-1	P-2
1	0-10	2	2	1	4	3	5	3	4	3	3
2	11-20	5	7	11	20	15	20	10	16	5	12
3	21-30	11	14	16	25	19	24	12	20	12	17
4	31-40	15	19	19	31	26	29	18	24	15	19
5	41-50	18	-	22	-	-	-	-	-	-	-



\*P-Pot mix

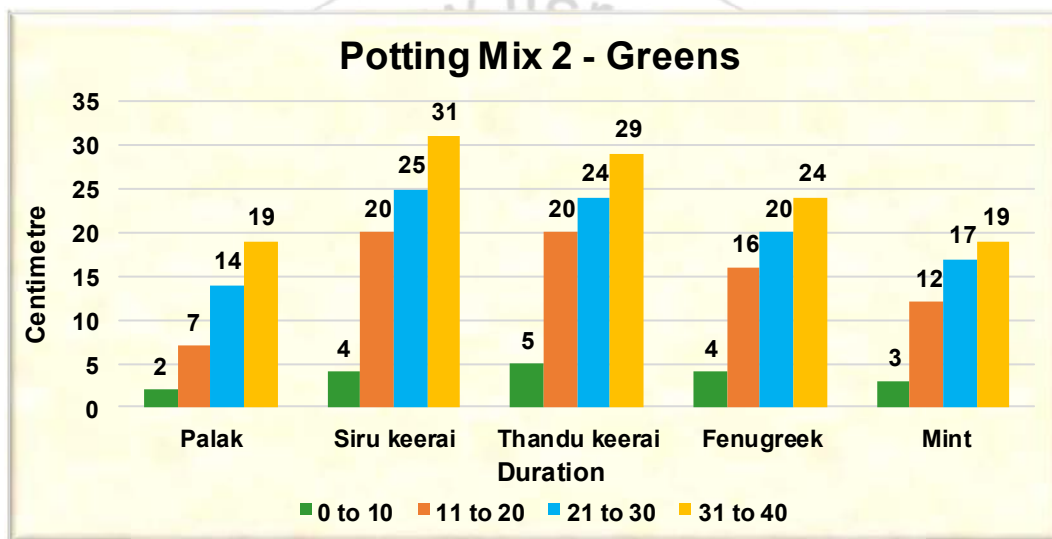


Figure 1 and 2: Growth Rate of Greens in Potting Mix 1 and 2

The above table and figure reveals the growth of five types of greens on two category of pot mix of slight variation in ingredients. Among these two categories, the pot mix-2 which contains red soil shows higher growth rate of greens compared to pot mix- 1 with ash.

Table 2 shows the growth rate of vegetables in potting mix 1 and 2

Table 2: Growth Rate of Vegetables in Potting Mix 1 and 2

S.No	Duration	Growth rate of Vegetables (cm)									
		Tomato		Brinjal		Chilli		Ladies finger		Bitter gourd	
		*P-1	*P-2	P-1	P-2	P-1	P-2	P-1	P-2	P-1	P-2
1	0-10	2	10	10	13	13	10	10	3	3	2
2	11-20	11	13	15	19	14	18	9	13	9	7
3	21-30	14	17	22	28	17	33	15	20	15	19
4	31-40	19	26	28	42	26	39	21	28	25	36
5	41-50	29	42	33	48	32	42	25	33	33	42
6	51-60	36	48	38	55	41	54	36	45	49	59

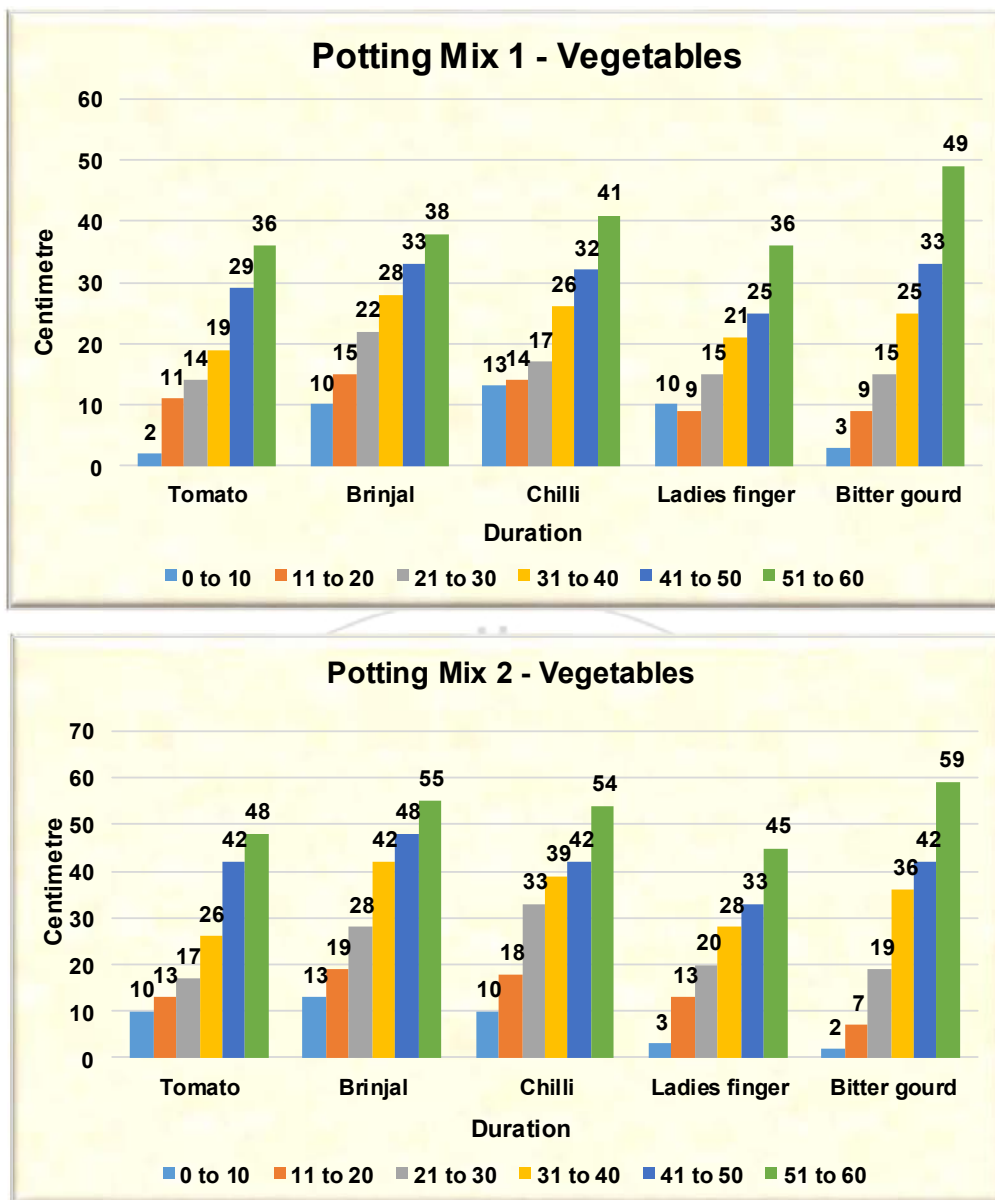


Figure 3 and 4: Growth Rate of Vegetables in Potting Mix 1 and 2

It is obvious from the above table and figure that the growth rate of vegetables in pot mix 2 is higher than that of the potting mix-1. Hence it is advisable to add red soil with other ingredients for potting mix preparation. During the 60 days duration bitter guard had grown to the height of 56 centimeters when compared to brinjal (55 cms) and chilli (54 cms) in the pot mix 2.

#### 4. Conclusion

Due to migration of people to urban areas, fertile agricultural land has been converted into houses and other infrastructures, thus the land for cultivation. By 2030, people living in cities will reach nearly 60%. The terrace garden can use household organic waste as manure and reduce pollution. Therefore all household wastes from the kitchen can be used by composting with the help of earthworms. Bio-degradable waste especially the kitchen waste generated from the selected locality of the households of Salem district could be collected for recycling the same as organic manure.

#### References

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