

On-Farm Recycling of Green Waste into Valuable Compost

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Why composting?

120 million tons of waste produced in the GCC countries in 2010 with over 22.2 million tons was municipal waste. The quantity of Municipal Solid Waste (MSW) per capita, the highest being 2.7 kg/capita/day in Bahrain and the minimum 0.7 kg/capita/day in Oman. Waste management is a priority in UAE as emphasized in Abu Dhabi 2030 and its waste management strategy with its objective to establish a world class sustainable waste management system to divert waste away from landfill disposal and maximize resource recovery. The waste management department in Dubai Municipality presently processes about 4000 tonnes of waste per day which is approximately 24% of the total available, rest is dumped in landfills.

What is Composting?

Composting is a process for turning on-farm organic waste materials into a farm resource and the best way of dealing with waste, both economically and environmentally. The aim of this poster is to provide low-cost on-farm composting technology to small-holder farmers to recycle farm waste into valuable resource, reduce land filling, and protecting the environment.

Benefits of composting:

- Sustainable recycling of green waste
- Reduce landfilling
- Less/limited use of chemical fertilizer
- Environmental protection
- Source of plant nutrients
- Improve soil tilth (physical health)
- Enhance water and nutrient holding capacity
- Enhance microbial population
- Enhance carbon sequestration and mitigate climate change
- Improve soil structure
- Enhance crop production

Parameter	Quantity
Organic matter	38.2%
Carbon : Nitrogen	36:1
Nitrogen	1.4%
Phosphorus	0.27%
Potassium	0.75%
pH	7.7
Moisture	<10%

Table 1: Characteristics of compost produced at ICBA

Low cost on-farm composting technology

Considering the beneficial uses of compost for landscaping and agricultural farms, the Dubai based International Center for Biosaline Agriculture (ICBA) at its Headquarter has initiated a low-cost compost production technology using the feedstock derived from plants clippings (grass, shrubs, ground cover and trees etc). To enhance composting process the raw material is inoculated with a mix of microbes (fungi, actinomycetes, mycorrhiza, trichoderma and bacteria) leading to form stable, nutritious and mature compost (Table 1).

Findings:

In green house study, among all treatments (Figure 1) compost applied @ 30 t ha⁻¹ (100 % ETC) performed the best and boosted biomass (an increase of 103% over control). Next better performance is recorded when compost was applied @ 60 t ha⁻¹ at both ETC 75% and ETC 100%.

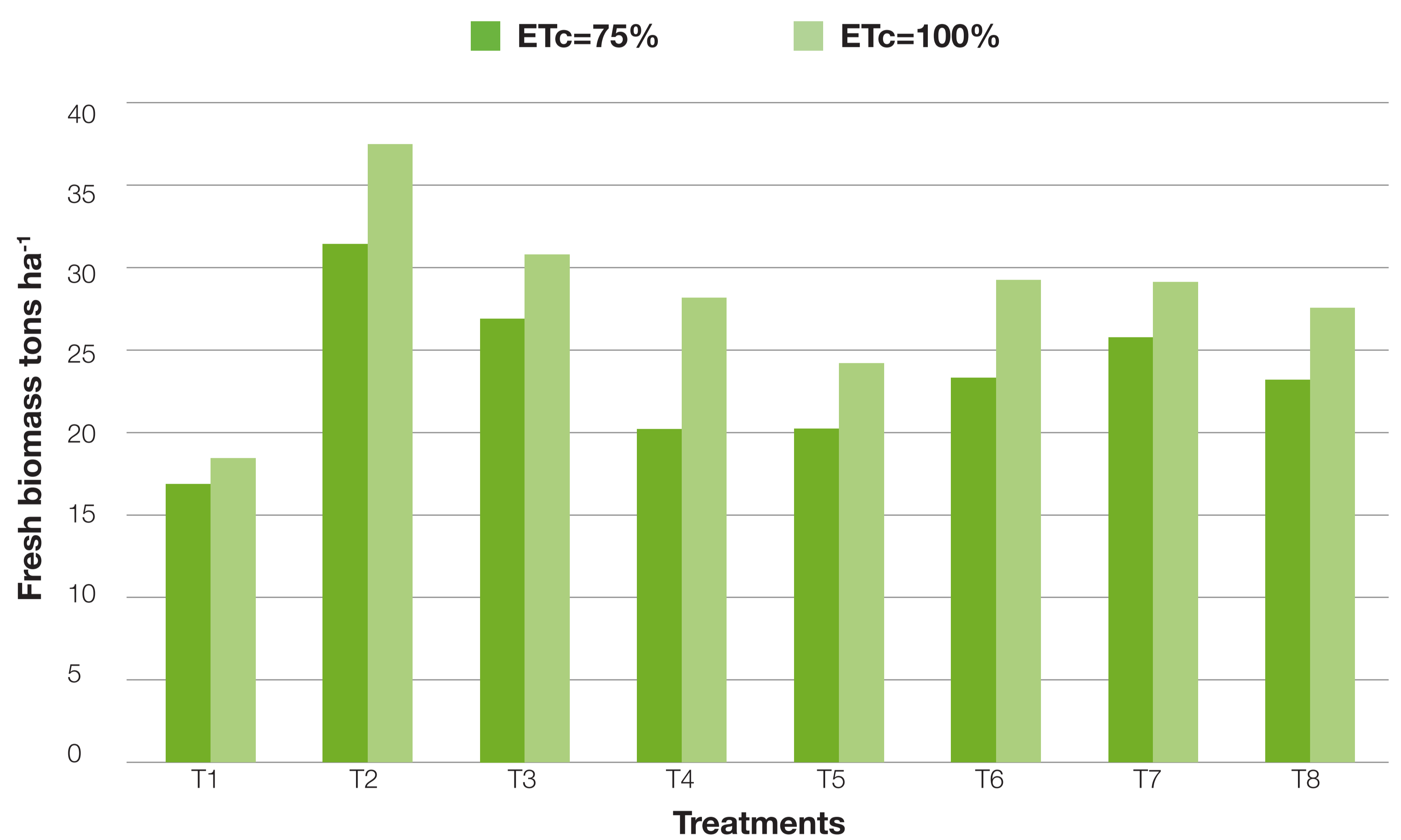


Figure 1: Comparison of biomass production with treatments and irrigation levels. (L-R: T1-T8) where T1 (Control), T2 (Compost @ 30 t ha⁻¹), T3 (Compost @ 60 t ha⁻¹), T4 (Zeolite @ 30 t ha⁻¹), T5 (Zeolite @ 60 t ha⁻¹), T6 (Compost 15 t ha⁻¹ + Zeolite 15 t ha⁻¹), T7 (Compost 22.5 t ha⁻¹ + Zeolite 7.5 t ha⁻¹), T8 (Compost 7.5 t ha⁻¹ + Zeolite 22.5 t ha⁻¹)

Conclusions:

Compost production from green waste is a sound and sustainable way to cut down the volume of waste materials at the landfills or incinerators. Such an activity is environmental friendly and cost-effective. This requires no extra material from outside the farm, but sustainable handling of on-farm green material.

Compost contains valuable nutrients that could reduce and/or supplement the use of commercial fertilizers, leading to low cost production and to make its use attractive to agriculture and horticulture operations.



Low cost on-farm compost production technology cycle at ICBA