

RECYCLING GREEN WASTE TO COMPOST FOR URBAN LANDSCAPES



Dr. Shagufta Gill
PostDoc – Solid Waste Management



Dr. Abdullah Al-shankiti
Senior Soil Management Scientist

Soil Management Program, Research and Innovation Division
International Center for Biosaline Agriculture Dubai, UAE
Email: s.gill@biosaline.org.ae

The addition of landscapes within the expanding urban sector is pre-requisite for the sustainability of urban planning and development projects. The urban landscapes provide aesthetic and eye catching views, platform for healthy exercises, conserve biodiversity, sequester carbon and mitigate the climate change impact. It is therefore essential to create healthy landscapes which are sustainable, environment friendly and easy to maintain. To assure such features, the planning is to be made from landscape site preparation, to development and implementation phases. In the site preparation phase, it is important to use soil material without pollutants and with a mix of organic material, as the soil material commonly used in landscaping projects are sandy. The sandy material is low in organic matter and inherent soil fertility (clay material) and thus have low water and nutrient holding capacity leading to heavy drainage and groundwater pollution. The use of the compost material is one of the options to improve the quality of the landscape base material.

Healthy landscapes are pre-requisite for the sustainability of new urban development projects



Compost mixing with soil is pre-requisite for healthy landscaping

Currently concerns are growing regarding the excessive use of chemical fertilizers, atmospheric pollution, soil health, biodiversity which has increased global interest in organic recycling practices. In these perspectives, composting is an attractive proposition for turning on-farm and landscape organic matter, mowed grass, pruned shrubs and trees into a farm and/or landscape resource.

Solid waste generated in the GCC region is around 120 million tonnes per year. In the UAE waste management is a priority leading to establish a world class sustainable waste management system to divert waste away from landfill disposal and maximize resource recovery for ultimate target of zero landfill. This way the waste material is recycled for beneficial uses and environmental protection. The ultimate objective of composting is to reduce waste material for land filling (dumping waste material), conserving biodiversity, improve soil quality for agriculture and landscaping activities, and protect the environment through increasing carbon sequestration and reducing groundwater pollution.

Compost addition to landscape sites improves soil quality, reduce landfilling, conserve biodiversity and protects the environment

Composting with microbial inoculants is the ideal way to produce high quality compost in a short span. The microbial inoculants facilitate the rapid and efficient conversion of raw organic materials during composting process. The high quality compost is enriched with nutrients which improves soil health and subsequently enhances the growth and yield of crops. Environmental protection is additional positive benefit of microbial inoculants compost because stable compost produced after microbial inoculation reduces NH_4 volatilization and nitrate (NO_3) leaching to ground water and protects the environment.

The enhancement of organic matter content in sandy soil through amendment with fresh or composted lignocellulosics will lead to provide better niche for vegetation development and agriculture production. While fresh organic matter may be hard to provide nutrient, in this regards the addition of composts alone or mixing with fresh organic matter in suitable ratio may be appropriate options. Not only the composts, but their components like humic acid and fulvic acid can have important bearing on improving plant growth at different developmental stages including seed germination and seedling vigor.

Landscape wastes can be transformed to beneficial resource for landscaping sites

At a preparatory stage of landscape project, a landscape architecture prepares a site map showing different site features, walkways, irrigation systems, plots for plants diversity (grasses, shrubs, ground cover, trees etc) to create an aesthetic look to attract visitors interest and to some extent to educate the visitors. At the implementation stage, the landscape site is prepared to level and undulating as the site map is approved. For efficient use of irrigation water it is recommended to level the landscaping site preferably using the laser guided land leveler or other suitable equipment. Once the leveling is accomplished and irrigation infrastructure is installed, the next stage is to prepare the land for various plants types and other features. In order to prepare plants beds, the compost is commonly mixed with soil to improve soil quality. Usually 3-5 kg per m^2 or variable quantities (based on soil type and plants) of compost is mixed manually or mechanically.

Considering the beneficial uses of compost for landscaping sites and agricultural farms, ICBA has initiated its production at the experimental station (see composting cycle in figure 1) 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 consortium of microbes (*fungi, actinomycetes, mycorrhiza, trichoderma and bacteria*) leading to form stable and mature compost consisting of organic matter (38.2%), C/N 36:1, P (0.27%), K (0.75%), pH (7.7) and moisture (< 10%). The compost not only improves soil's physical health (structure development) but also provides primary nutrients (nitrogen, phosphorous and potassium) essential for plant growth.



Dubai based ICBA has taken the initiative to convert green wastes to beneficial product "compost"

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