

Green Waste Composting

What is Green Waste?

Includes leaves, grass clippings, brush, branches and other forms of organic materials generated from parks, landscapes or gardens, separated from other solid waste. It does not include food waste which is more challenging to collect and treat.

Why is it a priority waste stream?

In 2015 some 4,556 tonnes of green waste was disposed in Güngör landfill (~5% of total waste disposal). This is an issue as i) there is no environmental benefit of disposing these materials in landfill, ii) valuable space needed for municipal solid wastes is taken up, iii) they decompose contributing to landfill gas and leachate, and iv) the materials have a high recycling potential.

Where and when is it produced?

Gardening is a popular hobby and a pastime and the excellent climate and long growing season means that green waste is generated in large quantities all year round, with an estimated 35,000 tonnes generated by all 28 local communities. Large quantities of green waste are burnt or dumped in the environment.



Güngör landfill Cell 1 is filling up fast!

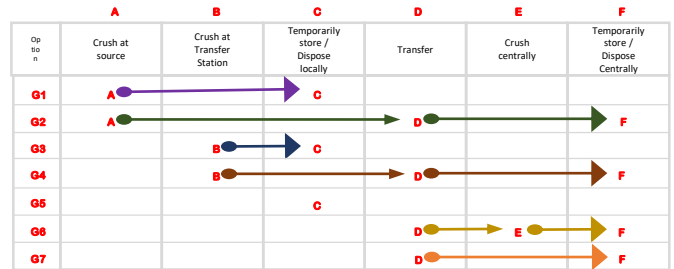


Why act now?

Güngör Landfill Cell 1 is quickly running out of space. Green waste needs to be prohibited from disposal at Güngör landfill. It is time for local communities to establish alternative systems for the management of green waste, starting now.

What alternative treatment options are there?

There are several options for treating green waste to recover and increase the value of the material. Composting is the least expensive and simplest option. This can be done in several ways locally or centrally (see table, right).



What value does compost have?

Applying compost to land helps plants absorb nutrients already in the soil and provides some extra nutrients too. Makes clay soils more airy and helps them drain better, makes them more friable, meaning they are easier to crumble and dig in. Helps sandy soils retain water that normally runs through, making it available to plants, reducing irrigation needs and increase ability to survive drought periods.

| Kompostlama tesisi | Hizmet verilen bölge | Tahmini işleme kapasitesi (ton/yıl) |
|--------------------|--|-------------------------------------|
| 1 Kuzey Merkez | Girne, Çatalköy ve Esentepe | 12,000 |
| 2 Kuzey Batı | Lapta ve Alsancak | 4,000 |
| 3 Merkez | Lefkoşa ve Gönyeli | 4,000 |
| 4 Batı | Güzelyurt ve Lefke | 3,000 |
| 5 Doğu | Mağusa ve Yeni Boğaziçi | 8,000 |
| 6 Karpaz | İskele ve Kuzey Doğusu | 6,000 |
| 7 Güney Doğu | Vadili, İnönü, Akdoğan, Paşaköy, Beyarmudu | 1,000 |
| Toplam | | 38,000 |

What plans are proposed?

A priority measure of the draft IWMP is for green waste to be diverted from landfill and managed separately from municipal solid waste through a network of decentralised green waste composting facilities (see table, left). The management arrangement that favours this type of operation is to involve the private sector and civil society.

What planning aspects should be considered?

When planning a composting system, the following aspects need to be considered as early as possible:

1. **Choice of technology:** The challenge is to choose the right site for the treatment facility according to the technology chosen (or, inversely, choosing the technology according to the available site).
2. **Size and capacity of facility:** Good estimates on how much green waste is produced, where, when and how it can be collected are required to ensure the operation is sized correctly for the waste captured.
3. **Meeting all regulatory requirements:** It is important to ensure sites operate according to the law.
4. **Program costs and financing:** Planning and ensuring financial sustainability is essential, ensure operating costs of selected technology are affordable, involve private sector.
5. **Meeting community expectations and concerns:** Involve the local community early to avoid complaints.
6. **Developing a market:** To sell the compost product, quality needs to be assured, the price needs to be competitive, and new sources of demand need to be created.

What conditions are required for good compost production?

The composting processes requires the following aspects to be monitored and managed to ensure good microbial processes break down the material:

1. Oxygen concentration
2. Free Air Space, particle size & structure
3. Carbon to nitrogen (C:N) ratio
4. Moisture content
5. Temperature
6. pH level

| Parametre | Aktif Kompostlama | İyileştirme | Ürün Depolama |
|------------------|--|-------------|---------------|
| Oksijen Seviyesi | | 13 – 18% | |
| Boş Açık Alan | | 40 – 60% | |
| Parçacık Boyutu | 3 ila 50 milimetre arası partikül karışımı | | |
| K:N Oranı | 25:1 – 30:1 | 18:1 – 23:1 | 15:1 – 20:1 |
| Nem İçeriği | 55 – 65% | 45 – 55% | 40 – 45% |
| Isı | 55 – 60oC | < 50oC | Ortam |
| pH | | 6.5 - 8 | |

What technologies are appropriate?

Several composting methods exist, the most appropriate is likely to be passively aerated mechanically turned windrows. In this the material is chipped by mechanical chipper and placed in rows around 3m wide by 1.5m high. The conditions are monitored and the 'windrow' turned from time to time in order to ensure the material is aerobic. The temperature and moisture level in the windrow need to be carefully managed.

What equipment is needed?

Chipper: Reduces particle size so transports and composts quicker



Tractor driver windrow turner: Turns material to manage composting conditions



Temperature probe: to monitor conditions



Transport and loading: Separate collection system for green waste with direct loading, or loading of on-site chipper prior to transport

Watering system: Available water and watering system (often included in windrow turner)

Collection and compost marketing communications: Communicating the collection schedule, needs and marketing product requires a dedicated staff member or team, and a communications budget.

For more information on technical aspects of composting see

http://www.compost.org/English/PDF/Technical_Document_MSW_Organics_Processing_2013.pdf