Manufacturing of “Bio-compost” by organic waste for soil improvement

Director :Morie Tsuge, Kiyoshige Tsuge

Tokai Bio Ltd 2-247 Osashima, Ena, Gifu, Japan

Speaker : Morie Tsuge

Corresponding author: Morie Tsuge bio.t@abeam.ocn.ne.jp

Abstract

Since 1995, Tokai Bio Ltd. has been developing a high performance “Bio-compost”, which consists of organic waste such as animal waste and wood scraps, through extensive bacteria research.

Tokai Bio Ltd. has donated over 30 tons of “Bio-compost” to the city of Unzen in the Nagasaki Prefecture (volcano-stricken area) of Japan for the purpose of improving the condition of its soil. The results have been extremely favorable. 10,000 trees that were planted in the volcanic area have grown healthy which proves that “Bio-compost” is an effective vehicle in restoring healthy vegetation to even the most difficult of environments. In the future, Tokai Bio Ltd. hopes to help build and restore a more eco-friendly environment which is a vital part of creating a sustainable society.

Key word：Bio-compost , Bacteria, The organic waste, Soil improvement, Foul odor control.

Bio Mechanism

The bacterium developed by Tokai Bio Ltd. has the following unique abilities and characteristics:

1. It digests lignin and cellulose efficiently.
2. It reduces and controls the foul odor that originates from animal waste.
3. It generates humus which is a useful nutrient for plant growth.

Raw Materials of “Bio-compost”:

Tokai Bio Ltd. uses various types of organic waste as raw materials to make “Bio- compost“.

Animal waste

Grass

Tree roots

Woodchips

Method of composting

We grind the disposed lumber and wood scraps into wood-chips and mix it well. Then, we add our “bacteria”.

Next, we continuously mix the bacteria and the raw materials for three months while making sure that the moisture condition maintains at a suitable level. This allows enough oxygen to interact with the bacteria which produces optimal results.

We add our “bacteria”

Case studies:

1. Unzen, Nagasaki Pref., Japan

Tokai Bio sent over 30 tons of “Bio-compost” to volcano-stricken areas of Unzen where 10,000 trees were planted.

“Bio-compost” proved to be very effective in restoring vegetation.

Also, 60,000 tree seeds were planted, and Tokai Bio provided “Bio-mat”, a sack made out of tropical tree fibre which improved the germination rate significantly.

Volcano-stricken areas of Unzen


微生物を加え 家畜排せつ物 剪定の枝葉 処理
アグロソイル
ごみ減量 そして究極の肥料
県内外から注目
岐阜

Figure 1: “Reduction of Waste” and “Ultimate Compost”

After

Before

“Bio-mat“

2. Grass waste from Shonai river, Nagoya, Japan

Previously, the volume of grass waste in the Shonai River in Nagoya city amounted to over 20,000m^3 a year, and it had become a burden to the city.

In the past, the grass waste had been incinerated along the riverbank, but it created a major problem due to the smoke. As a result, an alternative solution was sought out.

Tokai Bio was called upon, and we successfully dealt with this situation by using our “bio” approach where the grass waste was turned into “Bio-compost”.

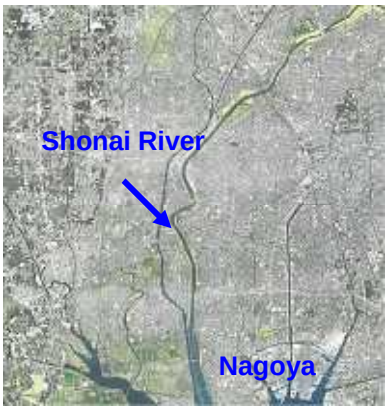

Figure 2: Map of Nagoya

3. Kagamihara, Gifu Pref., Japan

On April 5, 2002, a large scale forest fire occurred in Kakamigahara City, and it affected nearly 1000 acres. It was one of the largest forest fires in the history of Gifu Prefecture.

One month later, "Green Rebirth Project" was formed with the purpose of planting 10,000 trees to replace the damage caused by the fire.

Tokai Bio donated eight hundred 20kg bags of “Bio-compost” to the project to help improve the soil, and the results were remarkable.

"Green Rebirth Project"


苗木や肥料を寄付

緑の山再生プロジェクト

県へ養木社と東海バイオ

Figure 3: Donation of "Bio-compost”

4.Miyakejima, Japan

Tokai Bio donated 10 tons of “Bio-compost” to Miyakejima Island (volcano stricken area) in Tokyo to help reconstruct the soil structure damaged by volcanic ash.

It was a great success as the farmland was revived with “Bio-compost“.


恵那から三宅島へ
肥料で農地復興を
火山灰土壌もOK

Figure 4: “From Ena to Miyakejima

Reviving Farmland by Bio-compost”

Other promising applications

1. Chestnut skins

Tsuge is meeting with the students

In collaboration with a local agricultural high school in Ena, Tokai Bio has accepted the challenge of composting chestnut skins which are known for being one of the hardest of its kind.

Chestnus skins are a hazadous by-product of Kurikinton, a well-known sweet, which is produced throughout Japan, and Ena is particularly famous for its unique flavor.

Confectionary shops in the Ena region produce 500 tons of chestnut skins per year, and the disposal of the skins has become a problem.

Ordinarily, bacteria cannot breakdown chesnut skins, but Tokai Bio has created a special research team to develop ways to compost the skins. The project is still going on today with a very promising outlook.

2. Foul odor control

Reducing industrial odors by our bacteria

Tokai Bio has also found another application for its bacteria by help reducing the foul smell often found in various businesses and warehouses.

To this date, we have improved the condition of the disposal site for tofu refuse in Mino City as well as succeeded in reducing the foul smell of a pig farm in Nakatsugawa City.

In addition, we have reduced the pungent odor of three compost factories in Mie and Gifu Pref within the last year.

We can safely conclude that our “bio“ approach to the solution of industrial foul odor has been very successful .

References

Figure 1 : “Reduction of Waste” and “Ultimate Compost” Newspaper Yomiuri 23.Nov.1999.

Figure 3 : Donation of "Bio-compost" Newspaper Gifu 15.Nov.2002.

Figure 4 : “From Ena to Miyakejima Reviving Farmland by Bio-compost” Newspaper Cyunichi 16.Mar.2005.