TECHNICAL SHEET

Sembio" mobile composter

Some definitions

Compost: product of composting waste (Larousse, 2021).

Composting: the fermentation of certain agricultural or urban wastes, in order to recover elements rich in minerals and organic matter, which are then incorporated into agricultural land to enrich it (Larousse, 2021).

Composting is a natural process of "degradation" or decomposition of organic matter by microorganisms under well-defined conditions (Misra et al, 2005). Organic feedstocks, such as crop residues, animal wastes, food scraps, some municipal wastes, and appropriate industrial wastes, can be applied to soils as fertilizer once the composting process is complete (Misra et al, 2005).

Composter: a vessel in which plant debris to be composted is placed (Baraton, 2014). All plant waste from the garden is poured into the pile or composter, avoiding branches that are too large in diameter (Baraton, 2014).

Types of composting (Misra et *al*, 2005)

In anaerobic composting, decomposition occurs when oxygen (O) is absent or present in limited amounts. In this process, anaerobic microorganisms dominate and develop intermediate compounds such as methane, organic acids, hydrogen sulfide and other substances. In the absence of oxygen, these compounds accumulate and are not metabolized. Many of these compounds have strong odors and some of them exhibit phytotoxicity.

Aerobic composting takes place in the presence of a large amount of oxygen. During this process, aerobic microorganisms break down organic matter and produce carbon dioxide (CO2), ammonia, water, heat, and humus, which is the relatively stable final organic product. Although aerobic composting can produce organic intermediates such as certain organic acids, these are then broken down by aerobic microorganisms. The resulting compost, which has a relatively unstable form of organic matter, has very little risk of phytotoxicity.

Different components of the composter

1- The central axis with three symmetrical pallets located on three different planes

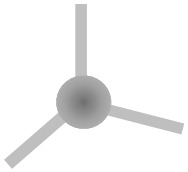

Figure 1 : Central axis

2- **The plastic barrel and its opening with hinge, hook and ventilation holes**

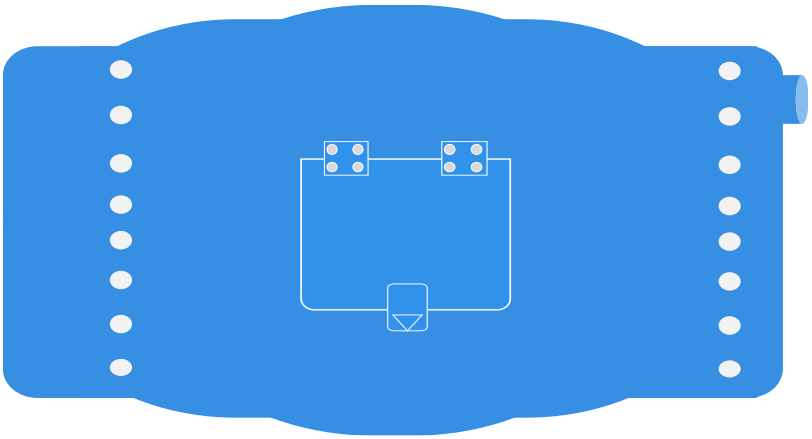

Figure 2 : Plastic barrel

3- Wooden support made of 6 elements maintained by nuts

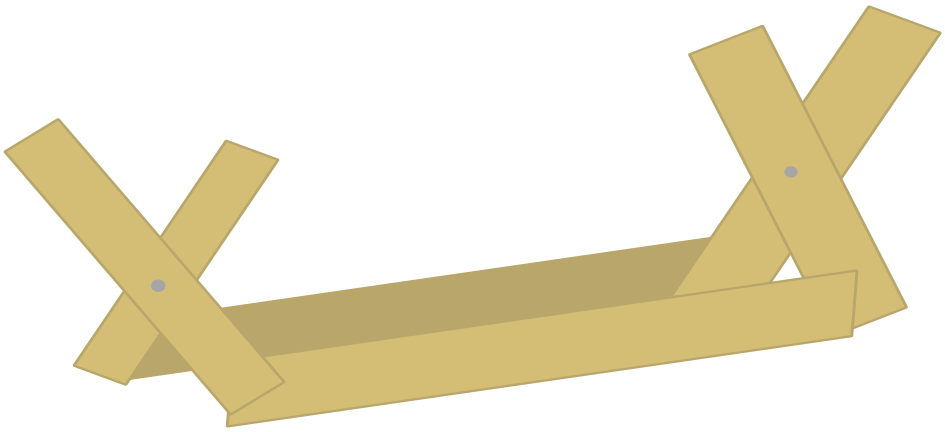

Figure 3 : Wooden support

Benefits of compost (CODEVAL, 2016)

The application of compost has benefits such as: - Increasing crop yields with the application of essential nutrients. - Prevention of soil erosion caused by rain and wind. - Prevention of infections and diseases. - Fertilization of arable land. - Quality product (cereals, vegetables etc.) without chemical elements.

Caractéristiques de la technologie

The **" SEMBIO "** composter has the particularity of being designed from recycled material such as the reused plastic barrel and the wood from the support. This process allows us to reduce the cost of making the composter.

In addition to the barrel and the wood, we used other materials such as galvanized iron tubes, with two different diameters, sheets, screws with nuts and cheap closing hooks.

The "SEMBIO" composter was developed within the framework of the project of the same name on onion self-sufficiency in Senegal.

The objective behind this technology is to promote biofertilizers as an alternative to the increased use of chemical inputs. It is an innovation developed essentially from recycled material.

Target of the technology

The "Sembio" technology is exclusively recommended for market gardeners and other horticulturists. It can play an important role in promoting agroecology and organic agriculture. It is a technology to be disseminated to producers, but also to research organizations, civil society and agricultural schools that promote healthy agriculture.

Field of application of the technology

Agricultural fertilization.

Stage of development or deployment of the technology

The "Sembio" technology has been developed, designed, and tested. It has been demonstrated within the framework of the NAAF funded project of the same name. Twenty copies of the composter have been produced and distributed to producers.

Bibliographic references

Misra R.V., Roy R.N., Hiraoka H. (2005) : Méthodes de compostage au niveau de l'exploitation agricole ; DOCUMENTS DE TRAVAIL SUR LES TERRES ET LES EAUX ; FAO ; 35p.

Baraton (2014) : Mes trucs et astuces de jardinier ; 192p.

CODEVAL (2016) : Manuel du Caisson de Compost du CODEVAL ; 11p.

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https://www.larousse.fr/dictionnaires/francais/composteur/17760 ; 07/10/2021 at 10h33

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http://aicd-africa.org/web/wp-content/uploads/5_[FR]%20MANUAL%20FOR%20IMPROVED%20COMPOSTING%20FACILITIES%20OF%20CODEVAL%20PROJECT.pdf ; 07/10/2021 at 11h15

Other references

Regional Center of Excellency on Dry Cereals and Associated Crops; HEADQUARTERS INSTITUTION: CENTRE D'ETUDES RÉGIONAL POUR L'AMÉLIORATION DE L'ADAPTATION À LA SECERESSE (CERAAS); Host country: Senegal; NSC MEMBER INSTITUTIONS : Dakar: - The Bureau of Macro-Economic Analysis (BAM/ISRA) - The Institute of Food Technology (ITA) Bambey: - The National Center for Agronomic Research (CNRA of Bambey / ISRA) Thies: - The Ecole Nationale Supérieure d'Agronomie (ENSA) for the UT/(ENSA) training newly associated with the Dry Cereals NSC is awaiting validation of their integration by the World Bank. - The Regional Study Center for the Improvement of Adaptation to Drought (CERAAS/ISRA) ; Coordinator: Ndjido KANE; Email: ndjido.Kane@isra.sn; ndjidokane@gmail.com; Telephone: +221 777232019 / +221 339514693.