School composting in Resende

A project by Resende's Municipal Department of Education and Evolua Mauá Institute

Objective

Introduce the practice of composting organic waste (only raw vegetables) generated in the school kitchen, mainly aiming to demonstrate to students:

1. the importance of using organic waste as a high-quality fertilizer for local food production, guaranteeing food security in the future and – eventually – income generation; and
2. the need to reduce waste and its impacts on nature and municipal expenses with its collection, transport and disposal at the sanitary landfill in Barra Mansa (dozens of kilometers from Resende),

Why to compost?

One of the biggest challenges that modern society faces is the correct destination of the immense volumes of waste that it increasingly generates.

In Brazil we generate more than 240 thousand tons of solid waste per day. In Brazil, for various reasons, around 75% of this volume is dumped into nature, in "dumps" without further care, causing soil and water contamination, in addition to public health problems.

Efforts to take advantage of recyclable waste, including mainly paper, plastic, metal and glass, are timid and insufficient, depending on logistical systems that collect and send them to recycling companies that are often far from the collection site – which makes the process economically unfeasible.

However, a significant part of this waste can be easily recycled in a decentralized way, generating a valuable and usable product in the very place or region where it was generated. This is organic waste, which can be transformed into high-quality fertilizer in a simple and safe process.

The National Solid Waste Law (2010) – which aims to reduce the volume of waste dumped in nature and promote its productive management – established the following targets for reducing the volume destined for landfills and dumps. Certainly, the reduction targets for 2023 are far from being achieved...

Porcentagens de redução progressiva das parcelas de resíduos secos e orgânicos encaminhados para aterros na região Sudeste do Brasil	2015		2019		2023		2027		2031	
	Plano de Metas									
SECOS / ORGÂNICOS	30%	25%	37%	35%	42%	45%	45%	50%	50%	55%

Indeed, decentralized composting, practiced very close to where organic waste was generated, can help to address several challenges, and its practice is being increasingly encouraged in urban areas around the world, in order to access its many benefits.

School composting in Resende

Some composting initiatives have already been tried in teaching units in Resendense, usually associated with school vegetable garden projects and with little support and pedagogical use.

The proposal now is to encourage the practice in a consistent and permanent way, to take advantage of all the environmental, productive and pedagogical potential that it offers.

Every school where there is generation of raw vegetable waste, some free space and interested students and educators, can implement simple and safe procedures to produce humus for gardens and vegetable gardens.

The dynamics of the daily routine

The first procedure takes place in the kitchen, separating raw vegetable waste: peels, stalks and unused leaves. In general, a 20 liter bucket is used, enough to collect one day's waste. If it does not fit, use a second bucket as it is easier to handle than a larger container.

Next, the fresh residues are taken to the wire mesh composter, where they are deposited and immediately covered with dry plant material, such as swept leaves, grass clippings, weeds, etc. With this care, negative impacts are avoided, such as bad smell, flies, etc.

Weighing and recording the daily load of waste.

Dumping the day's waste into the compost center.

Straw reserve to immediately cover the new fresh waste.

What to do when the composter is full?

Depending on the size of the wire cylinder and the volume of waste generated and introduced daily into the compost bin, the time to fill it to the top will vary. In general, a relationship between volume and daily load is sought that fills the cylinder in about 3 months.

Once full, a second wire cylinder is installed next to the first to receive the waste from then on. Inside the first one, its load will decompose for the next 3 months, while the second composter is filled.

When the second composter is full, empty the first one (whose load will already be ready for use), and fill it again during the next 3 months. Alternating the two cylinders, every three months there will be a new load of humus available for use at school, donation, sale, etc.

The pedagogical aspect

The practice of composting offers many opportunities to help children and young people understand the cycle of life starting from the most basic: the transformation of decayed organic matter into humus, into food, into life.

In this phenomenon, several contents can be explored, on the chemical elements and phenomena present in the composted material, the microorganisms present and their importance, the measurement and recording of materials diverted from the garbage truck, the mathematical relationships of weight, volume, density and value, as well as the socio-environmental and economic dimension of productive waste management, including food security, urban agriculture, entrepreneurship, etc.

Another skill developed with school composting is the opportunity for young people to express and experience ideas to improve the system and replicate it in their homes and neighborhoods, in addition to training skills for group work, stimulating leadership capacity and creativity, preparing to exercise the governance of their communities in challenging conditions in a few decades from now.

Calendário de compostagem (Abril 2023) Dia / Nome / Turma Segunda – Elena – 2002 Terça – Maria Paula – 901 Quarta – Vitoria – 801 Quinta – Sofia – 801 Sexta – Richard – 901			
The young volunteers to collect waste and compost it in April	*Daily weighing and recording of waste*	*Temperature outside and inside the compost*	*Community composting in windrows in Visconde de Mauá.*

For school composting to be successful, young people need to value nature, the future, and the work well done for themselves and their communities, and have the support of educators.

SME's support for activities

Resende's Department of Education, with the support of collaborators and partners, will distribute wire mesh cylinders – one per school – that will be used to compost its waste.

Other necessary equipments are limited to a scale and – for non-exclusive use – one or two buckets, a hoe and a broom.

SME, through a virtual network, will encourage the exchange of ideas and experiences involving composting and youth in participating schools, as well as information on similar projects in other municipalities, states and countries. The most interested young people will be invited to organize themselves into "practice groups" and exchange experiences.

SME, in partnership with the Environmental Agency of Resende – AMAR and the NGO "Instituto Evolua Mauá", will produce instructional materials in support of the activity.

The SME will seek a partnership with the local Regional Administration (responsible for pruning grass, weeding and sweeping in the vicinity of schools) to support the activity, mainly by bringing "dry" compostable materials, such as grass clippings, weeds, leaves, sugarcane bagasse, etc.

The SME will provide consultancy from the NGO "Instituto Evolua Mauá" to support activities related to postage and environmental education in collaboration with the most involved educators in the schools.

Each school will receive an initial visit from the consultants, who will install the first compost bin in a suitable location and explain the process better, making themselves available for support and visits whenever necessary.

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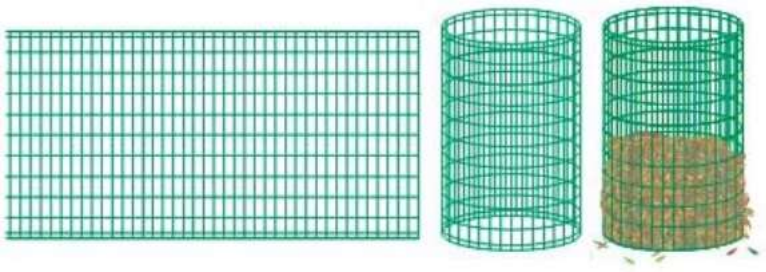
School composting in Resende:
Escola Municipal Francisco Quirino (entre 20?? e 2019); Colégio Estadual Antônio Quirino (desde 2022)
School composting in Brazil: compostagem escolar - Pesquisa Google
In the world: Composting at School - How to do it!-Composting - Suffolk Schools Recycling (example)

Datasheet

1. **Aerobic composting** – which we will adopt in this project – is the one that occurs with the presence of air (oxygen), unlike situations such as inside a hole or with the excessive presence of water.

   The wire mesh cylinders, made with screens 1m high and about 2 to 3m long (resulting in a diameter between 70 and 90cm), guarantee sufficient aeration for microorganisms, earthworms and other decomposers to do their work.



2. **In addition to air**, waste needs to combine the proper proportion of carbon-rich materials with nitrogen-rich materials. A compost formed only with "dry" materials (leaves, straw, sawdust, grass clippings, etc.), rich in carbon, will result in a very weak fertilizer, as it will lack a crucial element for the life and development of plants: nitrogen . On the other hand, a pile of just "wet", fresh materials (kitchen waste, manure, etc.), rich in nitrogen, will soon give off a bad smell and attract undesirable animals, vectors and insects. Therefore, every time fresh waste from the kitchen is introduced, it must be covered immediately with dry materials. In general, the ratio of dry materials covering wet materials should be 2:1.

3. **To speed up the process**, each day, before pouring the fresh waste into the compost bin, remove it with the help of a broom handle, shovel, etc. the layer of straw that covers the waste from the day before, pulling it close to the wire mesh all around, creating a "nest" in the center to receive the new waste. Then everything is covered with new straw (which will be removed to the sides the next day).

   This practice brings several benefits: (1) it speeds up the process by facilitating the transit of microorganisms, earthworms, etc. between the various layers of waste; (2) the dry "little wall" that goes up every day prevents waste from being exposed outside, attracting problems; and (3) improves aesthetics, which reflects the neatness in the process.

4. Compostable materials

- **Fresh waste, sources of nitrogen, from the school kitchen:** Peels of fruits, vegetables and roots, unusable stalks and leaves, egg shells, coffee grounds, etc.
- **Dry materials, carbon sources, collected locally (or delivered by the project):** Grass clippings, swept leaves, weeds, ash, sawdust (in small quantities)

5. Non-compostable materials

Human and animal feces and urine; Chemicals in general; Leftover meat or fish; Used toilet paper or diapers; Bones and spines; Cigarette ash and butts; Fats and dairy products;	Varnished wood; Glass; Metal; Oil, ink; Plastics and laminated papers; Invasive weeds