



NATAE
North African Transition
to AgroEcology

Composting crop residues in agroecology: residues from oases and olive pruning

Agroecological zones

Mountains

Cereal plains

Oases

peri-urban areas

Introduction

Agricultural activities generate by-products and residues that can be recycled through composting.

In the Mediterranean, the emblematic agrosystems of olive groves and oases generate abundant biomass of plant residues, notably pruning wood for olive trees, dried palms and date sorting residues for oases. Composting these residues is a sustainable and environmentally-friendly alternative to the common practice of burning them on the plot, which generates greenhouse gases, local air pollution and fire hazards.



Source: INAT, Tunisia

The benefits of composting in Mediterranean agroecological systems

In Mediterranean agroecological systems, composting crop residues and transforming them into organic soil fertilizer **improves soil fertility** and physical, chemical and biological health, **reduces dependence on chemical inputs** and **combats erosion** by enriching the soil with organic matter.

Composting olive pruning residues and dried palms also reduces agricultural waste and greenhouse gas emissions. Dried palms and olive pruning residues are a potential source of pests and phytosanitary risks (e.g. bark beetles for olive trees). Farmers traditionally dispose of them by burning them, which releases CO₂, degrades local air quality and increases the risk of fire.

On-farm composting methods and examples

Composting transforms organic residues into a stable, healthy product through an aerobic process involving microorganisms (bacteria, fungi).

The method most widely used in North Africa is **windrow** (or heap) **composting**. This is a simple method that can be implemented on both small-scale family farms and large-scale agricultural operations. Collective composting can also be organized by community initiatives or farmers' organizations.

Composting begins by **sorting the residues** so as to retain only those that are biodegradable. Olive pruning residues and palms must be **crushed or shredded**, usually mechanically with a shredder strong enough to handle very woody material over the long term. For better composting, and in the absence of a precise calculation of the ratio between carbon and nitrogen (C/N), farmers generally combine 25 to 50% green biomass or manure and 50 to 75% woody biomass.



Source: INAT, Tunisia



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The compost obtained is placed in a **shady spot** to prevent it from drying out. Windrows are formed, preferably in a slightly sloping spot, sheltered from strong winds and close to a **water source**.

The composting process takes place in 3 stages: an active thermophilic phase, a drying phase and a maturation phase. Pre-prepared and shredded waste is placed in a pile and moistened, allowing the micro-organisms present to begin decomposition. As the composting process is aerobic, aeration holes can be made in the windrows. The temperature and humidity levels of the windrows must be monitored. The windrows are also regularly turned until the compost has matured.

Challenges and limitations

Composting is a simple, inexpensive way of recycling large quantities of residues in a short space of time. It is suitable for small-scale farms, if they have access to a quality shredder. Nevertheless, composting presents a number of challenges that require careful management to ensure optimal results. In particular, aeration and humidity must be ensured to avoid the formation of unpleasant odours or poor-quality compost. In addition, it can be less effective in very hot conditions, especially if no measures are taken to retain moisture. In addition, woody residues such as pruning residues and palms need to be shredded before being incorporated, adding an extra step to the compost preparation process. The necessary equipment (shredders strong enough to handle very woody organic matter) is not always accessible to smallholders. Collective or coordinated use can usefully be organised: shredder equipment may justify a cooperative organization, or the mobilization of small private service providers.



**Funded by
the European Union**

Project funded by



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
**State Secretariat for Education,
Research and Innovation SERI**

Funded by the European Union under Grant Agreement no. 101084647. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them. For the associated partner in the NATAE project, this work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).