



BERNALILLO COUNTY EXTENSION MASTER COMPOSTER
PROGRAM IS BASED IN ALBUQUERQUE, NEW MEXICO

COMPOSTING IN THE DESERT

What Makes Composting in the Desert Unique and Challenging?

Abundant sunshine, low humidity, frequent winds and limited precipitation are trademarks of a desert climate, but they contribute to rapid evaporation of any moisture in or on the ground. Drought conditions increase the problem. Moisture is required for the decomposition of organic material. Controlling evaporation in order to keep composting material damp is the biggest challenge in the desert and requires a unique approach.

WHY COMPOST?

Soil amendment improves water absorption, fertility and resilience.

Conserve resources by converting organic waste to compost.

Reduce landfill volume when organic waste is used for compost.

Protect the environment by reducing the amount of methane gas produced when food waste is sent to a landfill.



OVERVIEW

THE PROCESS OF SUCCESSFULLY PRODUCING COMPOST REQUIRES A COMBINATION OF FOUR THINGS:

WATER AIR NITROGEN CARBON

Moisture: The pile should be maintained at a 50% moisture level, about the level of a wrung out sponge, throughout the decomposition process. Leaves should glisten with a film of water, but not drip. A bin with a limited number of air holes, placed in the shade and covered, will reduce evaporation. The contents may be watered as necessary to maintain moisture level.

Aeration: In desert composting it is necessary to modify the pile's exposure to air to prevent rapid evaporation. A dry pile ends the microbial activity that is at the source of decomposition. Regulate air flow by reducing the number of air holes in plastic bins, or by lining wire or wooden bins with plastic, and covering them. Bulking material should be added as the pile is built. Bulking moderates compaction of wet materials and provides spaces for air flow. Air comes in at the bottom and flows upward through the layers.

Examples of bulking materials: *corn cobs and stalks, sticks, pine cones, twigs*

Carbon and Nitrogen Ingredients:

Carbon combined with nitrogen supports proliferation of micro-organisms which break down organic matter. Nitrogen (greens) is necessary for microbial reproduction and carbon (browns) as a food (energy) source. Varied ingredients of differing sizes are added; smaller pieces will decompose more rapidly. Ideal nitrogen to carbon mix is determined by the composting method used. A rough mix guide is to add 2 parts carbon material to 1 part nitrogen material by weight.



Carbon Materials (brown)

dried leaves, plants, grass straw
nut shells shredded paper
corn cobs dryer lint
used paper towels, napkins, tissues
vacuum contents
natural fiber fabrics: felt, cotton, burlap, wool

Nitrogen Materials (green)

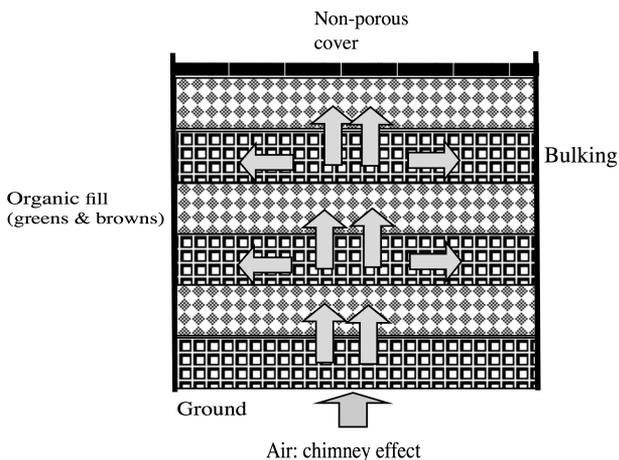
green leaves, grass, trimmings alfalfa pellets
coffee grounds fruit & vegetable scraps
leftover food tea & tea bags
hair, fur, feathers vegetarian animal manures
leather crushed egg shells
blood or bone meal leftover dry pet food

Avoid: dairy products, meat/fish, fats & oils, pet manures, glossy paper, ash, pig manure, pesticides, herbicides, vermicides, fungicides

Location: The pile or bin should be:

- ✓ conveniently located
- ✓ on the ground,
- ✓ near a water source
- ✓ in an area shaded from summer sun

Compost Pile Cross-section



COMPOSTING METHODS

INTENSIVE (HOT)

This is a batch method -- all materials are assembled and combined at once rather than adding materials over time. It may also be referred to as: dynamic, managed, fast, batch, or thermophilic composting.

Carbon to Nitrogen Mix: A workable mixture is 2 parts carbon material to 1 part nitrogen material.

Size & Containment: From 3'x3'x3' - 5'x5'x5' bin with a limited number of air holes. Can be made of wood; straw bales; concrete blocks; plastic or wire mesh lined with plastic or cardboard.

File Construction:

- Place 6-12" of bulking material at the bottom of the bin.
- Soak the browns in a wheelbarrow, then mix in the greens. (50% moisture level)
- Use about 6" of the mixture, then add 4" of bulking. Continue the layers until the bin is full.
- Cover (lightly) the top of the pile with plastic, cardboard, leaves or straw to slow evaporation. In 24 to 72 hours the pile will heat up as a result of microbial enzymatic activity. A temperature of 150° F is adequate and should be sustained for several days. If a pile fails to heat sufficiently, it may be turned and more nitrogenous material added. Overheating may be controlled by turning and watering the pile.
- When the pile starts to cool down (about 7-14 days) then it should be turned, churned and watered to maintain 50% moisture. Ideally the top becomes the bottom (turning) and the sides become the insides (churning) so that all the material eventually becomes exposed to the high core temperature.
- The turned pile will heat up again. This turning process continues until everything except the bulking material has turned to humus-the end product of microbial decomposition.





- Screen the humus to remove bulking material. Then allow it to cure for 2-4 weeks. Do not allow the humus to dry out completely.

Microbial Action: Microbes consuming and breaking down carbohydrates releases energy in the form of heat.

End Product: The rate of decomposition is variable; humus amounting to 1/2 - 1/3 of original pile size will form in 4 - 12 months.

EASY(COLD)

This method uses a process of continuous addition of organic materials over time. It may also be referred to as: dump-and-run, or slow, possible static composting.

Carbon to Nitrogen Mix: Ideally the ratio is 2:1 by weight, but with this method, particular attention need not be paid to an ideal C:N ratio. Any organic material on hand may be moisturized and added. It is the choice of, and at the convenience of, the individual composter.

Size & Containment: sizes vary from small up to 5'x5'x5'. Containment can be: pit, trench, layered sheet, open pile (covered), container/bin.

Pile Construction:

- Begin the pile with an 6"-12" layer of bulking material.
- Soak any dry organic material in water to approximate 50% moisture. Mix in any nitrogenous materials, and begin a 6" layer of this organic fill.
- Cover the pile with plastic, cardboard, old rugs, or other available non-porous material to limit evaporation.
- Add moisturized organic material as it becomes available.
- Add another layer of bulking material after every 6" of fill.
- Sprinkle with water to maintain moisture level as needed.
- When humus has been created at the bottom of the pile, it should be harvested, then screened to remove bulking and pieces that have not decomposed, then cured for 2-4 weeks. Do not allow the humus to dry out completely during the curing process.
- A cold pile may remain static as long as it is bulked and moisture is maintained at 50%. Turning and churning is the choice of the individual composter.

Temperature: Cold piles equilibrate with the ambient air temperature. If the pile temperature goes below 50 F microbial action will slow, but attempts to increase or preserve heat are not necessary.

Microbial Action: The environment of a cold pile often favors decomposers like fungi, molds, actinomycetes and those bacteria that appreciate cooler temperatures. Insects also eat the organic materials. Composting red worms may be added to the pile.

End Product: Humus amounting to 1/2 - 1/3 of original pile size will form in 12 - 18 months.



SUMMARY

The hot, dry desert climate contributes to rapid evaporation. Decomposition of organic material to form humus requires moisture. Composting techniques for desert living are all directed at decreasing evaporation.

- ✓ Use a containment system that reduces airflow to decrease evaporation. Bins made of wire or widely spaced wooden slats should be lined with plastic or cardboard. Tape over some of the air holes in commercial bins. Lightly cover the top of the pile or bin with plastic or cardboard.
- ✓ Add layers of bulking material between layers of fill material as the operation is built up. Bulking helps maintain spaces in the organic fill so that air can penetrate throughout. The bottom layer should be 6 – 12 inches thick and successive layers 4 – 6 inches thick. Bulking materials decompose more slowly and resist compression.
- ✓ Presoak any dry organic material (such as leaves or paper) before adding it to a composting operation. Shred or break up dry materials and allow them to soak in a bucket or wheelbarrow to absorb moisture.
- ✓ Place the compost operation in the shade during hot months.
- ✓ Composting material should be placed directly on the soil, asphalt or concrete will heat up and increase evaporation
- ✓ Add water as necessary. For cold piles, churning, mixing and adding water should be done periodically as needed. Hot piles need to be completely turned, mixed and watered at 7 – 14 day intervals until contents are completely decomposed. Cold piles may remain static (no turning) as long as bulking material is added regularly and 50% moisture is maintained.
- ✓ Be patient, decomposition is a slow process



COMPOST HAPPENS. WE CAN HELP!



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