

Whole Cycle Tuesday

Takeaway

Wood-and-compost biofilter media gives organic materials another useful role beyond the landscape. By creating a habitat for beneficial microorganisms, the blend turns natural biological activity into a practical tool for treating odorous air. It is another example of how the value of wood and compost extends across soil, water and air.

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*"Nature does not hurry,
yet everything is
accomplished."*

— Lao Tzu

Biofilter Media: How Wood and Compost Help Clean the Air

Wood and compost are familiar materials for improving soil, but they can also help treat air. Blended together in a biofilter, they support a living community of microorganisms that break down odor-causing gases. At composting facilities, wastewater treatment plants and biosolids operations, biofiltration can help reduce the odors carried in collected process air before that air is released.

How does it work?

A fan moves collected air through a bed of biofilter media. As the air passes around the wood and compost particles, odor compounds dissolve into the thin layer of moisture coating their surfaces or attach to the media itself.

Microorganisms living there then use suitable compounds as a source of energy. Depending on the compound, biological treatment produces carbon dioxide, water, mineral salts and additional microbial growth. The media provides the habitat; the microorganisms perform the treatment.

Why blend wood and compost?

Each ingredient contributes something different. Coarse wood creates open spaces that allow air to move through the bed and gives microorganisms surfaces to colonize.

Compost supplies microorganisms and nutrients that help establish an active biological community. Together, the materials must balance microbial habitat with airflow: a blend that becomes too dense can increase the resistance the fan must overcome. Research on wood-and-compost biofilters found that increasing the compost proportion increased this resistance.

What does the biofilter remove?

A properly designed system can reduce overall odor and treat compounds such as hydrogen sulfide, the gas associated with a rotten-egg smell, and ammonia. It can also address certain biodegradable volatile organic compounds. Performance varies with the gases present, their concentration and the time the air spends in contact with the media. Different compounds respond differently, so effective odor control requires matching the system to the air being treated.

Keeping the living filter working

Moisture is essential. In one study of wood-and-compost media, moisture had a greater influence on odor, hydrogen sulfide and ammonia removal than the blend ratio. Airflow and contact time also matter: the air needs to reach the active media and remain there long enough for treatment. Over time, compaction can affect airflow, making media condition an important part of ongoing operation.