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Weekly Newsletter
from Agresource Inc.
for turning waste into
opportunity

Whole Cycle Tuesday

"The environment is where we all meet; where we all have a mutual interest; it is the one thing all of us share." — Lady Bird Johnson

Key Takeaway

Carbon from finished compost:

- Increases soil organic matter
- Improves aggregation and pore structure
- Enhances water-holding capacity
- Increases cation exchange capacity (CEC)
- Supports microbial diversity and resilience

While compost is not a permanent carbon sink, a meaningful portion of its carbon can remain in soil for multiple **years**, especially when combined with reduced disturbance.

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How Much Carbon Is in Finished Compost — and Why It Matters

Finished compost is often described in terms of nutrients, stability, or maturity, but an equally valuable component is carbon. Carbon is the backbone of organic matter, the driver of soil biology, and a key contributor to long-term soil health.

Typical Carbon Content of Finished Compost

Most finished, mature composts contain 25–50% total carbon by dry weight, depending on feedstocks and processing conditions. This carbon is no longer easily degradable; much of it has been transformed into stable organic compounds during composting.

By comparison:

- Fresh plant residues may contain 45–55% carbon, but most is rapidly lost as CO_2
- Finished compost retains less total carbon, but far more biologically useful and persistent carbon

A common lab value reported is Total Organic Carbon (TOC), which reflects the carbon still present after active decomposition has ended.

Where the Carbon Goes During Composting

During active composting, microbes consume readily available carbon as an energy source. Through respiration, a significant portion, often 40–60% of the original carbon, is released as CO2

The carbon that remains becomes:

- Microbial biomass and residues
- Humic and fulvic compounds
- Physically protected carbon within organic aggregates

This remaining carbon is chemically and biologically more stable than the original material.

Carbon Forms in Finished Compost

Not all carbon in compost behaves the same way in soil:

- **Labile carbon**: Small fraction, fuels microbial activity after application
- **Moderately stable carbon**: Supports aggregation and nutrient retention
- **Recalcitrant carbon**: Persists for years, contributing to long-term organic matter