

Whole Cycle Tuesday

Did You Know?

Lignin is **one of the most abundant organic polymers on Earth** — second only to cellulose.

White-rot fungi are among the few organisms that can fully break down lignin, using specialized enzymes.

Compost piles rich in lignin can help create **humus**, which can **lock carbon in soil for centuries**, supporting climate resilience.

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"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

Understanding Lignin: The Hidden Challenge (and Opportunity) in Composting

What is Lignin?

Lignin is a complex organic polymer found in the cell walls of plants, particularly in woody tissues. It provides plants with strength and rigidity, making them resistant to weather, pests, and microbial attack. This durability is essential for plant survival — but it also means lignin is **one of the most stubborn components to break down** in composting.

Lignin's Role in Composting

While lignin slows the decomposition process, it isn't a waste product. When it finally does break down — primarily through the action of specialized fungi and certain bacteria — lignin contributes to the formation of **humus**, the long-lasting, stable organic matter in soil. Humus improves soil structure, enhances water retention, buffers pH, and supports plant health over the long term.

Why It Matters

Patience with lignin-rich compost materials pays off. Instead of aiming for rapid decomposition alone,

composters who embrace lignin's slow cycle are investing in **long-term soil health and carbon sequestration** — both critical for sustainable agriculture and climate resilience.

How to Manage Lignin in Your Compost Pile

Successfully incorporating lignin-rich materials into compost requires some strategic adjustments:

Encourage fungal growth: Fungi, particularly white-rot fungi, are key to breaking down lignin. Maintaining a slightly moist, aerated pile encourages fungal colonization.

Increase temperature: Higher pile temperatures (above 130°F/55°C) can accelerate the softening and partial breakdown of lignin structures.

Use a balanced mix: Combining "browns" (carbon-rich, often lignin-heavy) with "greens" (nitrogen-rich materials) ensures a healthy microbial community.

Shred materials: Break up woody materials into smaller pieces

