Traditional Composting vs Miracle Capture Alternative Composting at Commercial Scale

Issue	Traditional Composting	MIRACLE CAPTURE
Labor	**Intensive** Properly managed compost piles require frequent turning of piles, which require specialized equipment and many labor hours.	**Minimal** Miracle Capture piles, once covered and compacted, require no turning. Piles are left undisturbed until product is finished converting.
Fire Risk	**High** Improperly managed piles are at constant risk of spontaneous combustion due to methane gas accumulation and leakage. Fire is a constant risk in all operations.	**Very Low** The Miracle Capture process maintains an internal environment inhospitable to methanogenic microbes, negating methane gas production.
Time	**6 mo - Years** Well run operations generate a new batch of salable compost roughly every six months. Each windrow is turned multiple times per week for at least 4 months, followed by curing for 2 more months. Unmanaged piles take years to decompose.	**6-8 Weeks** Once chipped material is placed into piles and compacted, market-ready compost is ready in roughly two months. With chipping included, and a stubborn combination of (worst-case) conditions, the Miracle Capture process can extend up to 12 weeks (1).
Cost	**High** Many well-run operations in the US require govt incentives to generate profits. High labor, expensive equipment, time to process and price of final material make profits difficult.	**Controlled** By removing the need for mechanical aeration/turning, labor and machinery needs are drastically reduced. The Miracle Capture System by comparison is affordable.
Odor	**Foul** During decomposition, microbial populations release sulfur compounds, ammonia, and methane as byproducts which are associated with the unpleasant smell of decaying organic.	**Mild** The Miracle Capture process relies on a different set of microorganisms to accomplish conversion, which breaks down sugars and compounds without the production of methane & foul odors.
Mass	**Low** 50-60% of the starting mass is lost through traditional composting	**High** Up to 97% of the starting mass is retained through the MC process.
Emissions	**High Risk** Over 50% of the mass loss can be attributed to microbial respiration which converts organic carbon to CO2, CH4 & N20 which is released back into the atmosphere(2).	**Low Risk** Significant levels of carbon are captured and stabilized via humification, exponentially diminishing atmospheric greenhouse gas re-entry.
Carbon	**Standard** Up to 50% of the initial carbon contained in raw organic waste is sequestered through traditional composting if very well managed. *Raw biomass is generally 50% carbon*	**Elevated** MC sequesters up to 97% of the initial carbon, which is 47% *more* carbon capture when compared to traditional composting. *Raw biomass is generally 50% carbon*
Nutrients	**Good** 50-70% of the nutrients contained in the starting organic biomass can be retained with well maintained piles. Low nutrient starting material yields end product in need of supplemental fertilization.	**Exceptional** Minimal nutrient loss through conversion process. End product nearly identical in nutrient content to starting material. High nutrient starting material yields end product in need of dilution before use.

- Ideal conditions are 2" chip size with daily ambient temperatures above 45F. Larger materials can be broken down in the same manner (without turning), but additional time is required to accommodate for larger chip size. Cooler temperatures can also slow the process. Food waste and other organic non-woody biomass converts much faster.
- *Bernal, M.P., et al. (2009) in Bioresource Technology*