NEWTRIENT SNAPSHOT

Agrilab Technologies Inc.

Compost Aeration and Heat Recovery (CAHR) Technology

BUSINESS OVERVIEW

Based in northern Vermont, Agrilab Technologies Inc. (AGT) comprises a team of compost engineers, dedicated to advancing innovative agricultural practices. Committed to building healthy soil and reducing waste, AGT assists its customers in elevating their composting operation to the next level. Following initial research and development efforts in Canada, AGT successfully introduced its Compost Aeration and Heat Recovery (CAHR) technology in Vermont in 2006. AGT has now implemented CAHR systems in seven states and consults on projects nationally and internationally.

PROJECT

TECHNOLOGY OVERVIEW

By employing aerated static pile (ASP) or turned aeration windrow (TAW) practices and optimizing oxygen levels, the CAHR system enhances composting efficiency while also capturing renewable thermal energy generated during the process. This heat can be utilized for heating facilities, pre-heating wash water, drying products before screening and distribution, and enables composting operations to continue even in freezing winter conditions.

PROJECT SIZE

The scale at which a composting system on a dairy can operate depends on the manure management system, size of the operation, and feasibility. Based on a feedstock bulk density of 1,000 lbs/yd^3, a typical batch size of feedstock ranges from 110 to 300 yd^3, depending on the mixture. The most popular equipment models can accommodate operations with feedstock volumes ranging from 1,000 to 30,000 yd^3/year, making them adaptable for various scales. Batch retention times range from 2 to 16 weeks. The expanded product line serves small dairies with as little as 100 yd^3/year, or the larger modular units can process over 100,000 yd^3/year.

REQUIREMENTS

For optimal implementation, farmers need a concrete or gravel working pad for windrows, power and data connections, and a consistent source of a raw, organic by-product to be used as feedstock, such as bedded manure, dewatered manure solids, or spoiled feed. Proper planning and regulatory compliance are crucial along with routine maintenance, monitoring, record keeping, and training for personnel to keep the system running effectively and efficiently.

KEY CALL-OUTS

Energy and Cost Savings:
25-50% labor cost reduction and decreased heating oil, propane, and/or diesel consumption. Versatile thermal energy capture for on-farm applications and less space needed for processing than traditional windrow composting.

Accelerated Compost:
Compost treated with a CAHR system was suitable for market in approximately 25-75% of the time as conventionally turned windrows, with less nitrogen loss.

Improved Water Quality:
Reduces space required for composting and stormwater management. Mitigates nutrient leaching and pollution, enhancing overall water quality.

Findings are based on an evaluation conducted under a Conservation Innovation Grant awarded to Newtrient. To view a more detailed description of these results, visit the Agrilab CAHR Evaluation Summary on the Newtrient website.

FINANCIAL OVERVIEW

CAPITAL INVESTMENT

As of 2023, standard, AGT commercial-scale models of CAHR systems range from $30,000 to $192,000, excluding installation expenses. It's important to understand that these costs can differ due to system size, type, customization, and whether multiple modules and additional infrastructure are required. USDA and state cost share funding may be available for some projects.

DOWNSTREAM BENEFITS

When not utilized on the dairy, composted manure generated from the CAHR system can be sold as a soil amendment, for bedding to other farms, fertilizer, or as a component in potting soils.

ENVIRONMENTAL IMPACT

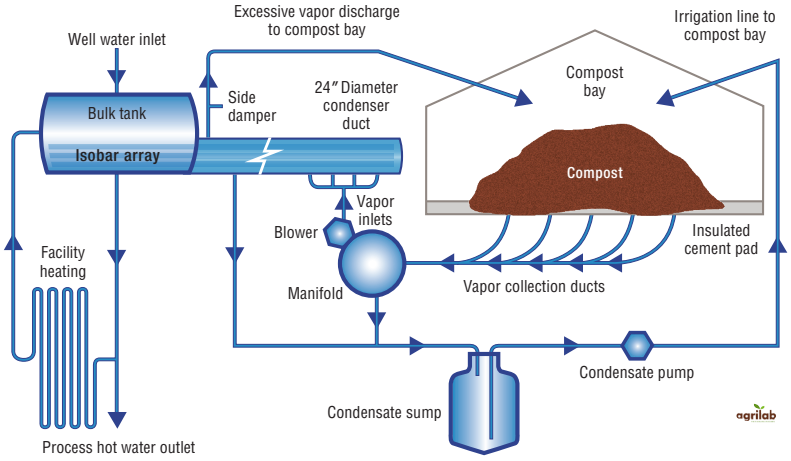
WATER QUALITY

CAHR-treated compost provides substantial environmental benefits by reducing nutrient leaching, thus preserving soil health and fertility. Rapid maturation and reduced exposure to precipitation minimize leaching and runoff risks, protecting water sources. Moreover, its lightweight, nutrient-dense composition eases transport and field application, curbing over-application and subsequent nitrate and phosphorus losses. This preservation of water quality ensures environmental integrity.

ENERGY CAPTURE

CAHR systems capture thermal energy through their water-based heating systems. Thermal energy can have various on-farm uses such as heating buildings, drying finished compost, preheating water for washing, thermal support for anaerobic digesters, and other on-farm processes.

FLOW DIAGRAM OF A CAHR SYSTEM



NEWTRIENT'S 9-POINT TECHNOLOGY SCORING

For Agrilab Technologies Inc. CAHR Technology

Visit the Agrilab CAHR page in Newtrient's Solutions Catalog.

Each solution can earn up to nine points, one for each criterion. Colored numbers indicate fulfilled criteria.

1 | Operational History
2 | Operational Reliability
3 | Market Penetration
4 | Capital Cost
5 | Operations & Maintenance Cost
6 | Value Proposition
7 | Vendor Information Sharing
8 | Case Study
9 | Funding Availability

Discover Newtrient's technology evaluation process: Learn more about Newtrient's 9-Point Technology Scoring System.

Newtrient's mission is to reduce the environmental footprint of dairy while making it economically viable to do so.

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