



Technology/Service: Agrilab Technologies Inc. – Compost Aeration, Drying, Compost Aeration and Heat Recovery

Information by: Brian Jerose

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COMPANY INFORMATION

Company: Agrilab Technologies, Inc.

Phone: (802) 933-8336

Web Site: <https://agrilabtech.com>

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City: Enosburg Falls

State: Vermont

Zip Code: 05450

TECHNICAL CONTACT

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DEMONSTRATION SITE CONTACT

Site Name: Foster Brothers Farms, Middlebury, VT

Contact: Brian Jerose

Title: President/Co-founder

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INITIAL TECHNOLOGY OVERVIEW

This information is to guide in the development of a more specific and detailed Technology Information Request. Please answer the following questions for each Technology or Service Provided.

What is the name of the technology or service you provide?

Compost Aeration and Heat Recovery (CAHR), material drying, compost aeration.

Describe how this technology is used in a larger Nutrient Management System. Please be as detailed as possible.

Agrilab Technologies Inc. (AGT) systems process manure into low pathogen, nutrient stable compost products for use as bedding, crop fertility and product sales. Standard products AGT for manure management include the AGT Compost Hot Skid, Hot Box, Mini-System, Drying and AerSkid units. Forced aeration accelerates the composting process for manure bedding, forestry residuals, food scraps and other biomass. AGT systems have heat recovery options and are modular to meet the range of scales for dairy applications.

How many systems do you have installed on dairy farms or other livestock operations?

SYSTEMS	NUMBER OF SITES	SIZE OF INSTALLATIONS
Dairy	12	500 to 20,000 cubic yards of material composted/processed per year

Pork		
Poultry		

What's the smallest and largest farm using your system?

The AGT system serves dairy herds from 50 cows to 2,000+ head. The system can be scaled so there is no maximum size. .

Does this technology have a 12-month record of reliable performance on at least three dairy farms?

Yes. AGT second-generation systems have been continuously operating since 2016 with the modular system design. References are available upon request.

Do you have a preferred region or area for the location of projects?

Northeast base with national range. Systems installed in VT, NY, MA, NH, CT, MI, MT, and CA

Input and output of your unit/system – do you have a mass balance analysis?

If a mass balance is available, please include below or attach as a separate document.

The input is raw manure of varying moisture content. There are a variety of output products depending on the needs of the dairy. A mass-balance is available. Typical 50% volume reduction during composting results in reduced land application and/or trucking costs

Input material description and characteristics:

For example: raw manure, digestate, screened digestate, suitable non-farm feedstocks, other.

Raw manure solids from bedding pack, separated solids from liquid separation equipment (e.g., screw press), digestate, screened digestate, feed spoilage, forestry residuals, and food scraps of all types.

Does the technology treat the full manure stream for a farm or a fraction of the stream?

The process can treat all the dairy manure solids on the farm if compost mix can be at 60-65% moisture.

Do you consider this a mature system or ongoing farm development?

Mature technology, proven with operating histories. The first system was installed in 2006 – operating successfully since then.

Any weather constraints? Yes No *If so, please describe.*

Systems are either enclosed or have open-air working pads/bays. For outdoor systems, heavy precipitation can impact batch moisture content, increase density, and require stormwater controls for nutrient runoff. Capable of operation in cold winter conditions.

Any bedding constraints? Yes No *If so, please describe.*

No bedding type constraints, and composted manure is an ideal bedding replacement.

Output material description and characteristics:

Please include the % of the total stream for each material, i.e. 10% fiber and 90% screened liquid by weight.

In addition to livestock bedding, some dairies realize new revenues sources from compost sales of material previously land applied as raw manure, waste feed and other biomass.

Do the Outputs of the process have a resale market identified? Yes No

If so, under what brand name or who is the contract with?

Most sites sell compost to diversify farm income and describe improved flexibility in timing of field applications of nutrients via compost. The Bruley-Demeritt Farm documents improved nitrogen conservation and enhanced on-farm distribution of carbon, nitrogen, and phosphorus. Compost markets are very local and therefore product pricing is variable.

Is this process scalable and to what extent (top and bottom limits)? Yes No *If so, please describe.*

The system is scalable from 50 cows to no upper limit due to modular design. New AGT Mini-System available for smaller sites.

Do you have a known scaling factor? Yes No *If so, please describe.*

50 cows and up. Standard units work in 4 batch increments of 125-250 cubic yards per batch.

Does this technology require any air input? Yes No

Yes, forced aeration is typically delivered in negative aeration mode, with positive and recirculation aeration capabilities.

What is the preferred air connection? For example: psi, fitting size, air quality.
If not distributed by the system, please list each connected device.

Aeration blowers 1hp to 10hp depending on compost batches, connected via HDPE aeration pipes to windrows.

Does this technology require any water input? Yes No If so, please describe.

What is the preferred water connection? For example: psi, fitting size, water quality, gpm.
If not distributed by the system, please list each connected device.

Does this technology require any electrical input? Yes No If so, please describe.

Electricity required for 1 to 10 hp blowers, circulator pump, valve actuators and control panel.

What is the preferred electrical connection? For example: phase #, voltage, full load amps.
If not distributed by the system, please list each connected device.

Three-phase, 220V, 30A service recommended. Four-prong, twist lock 220V electrical outlet required for unit plug-in. 110V option ok

Does this technology require any mechanical input? Yes No If so, please describe.

What is the preferred mechanical connection? For example: horsepower, connection, rpms.
If not distributed by the system, please list each connected device.

Does this system require any special plumbing? Yes No If so, please describe what is required.

Only standard plumbing connections needed for closed heating loop and/or heated process water, one circulator pump included on units.

Does this system require any special foundations or pads? Yes No If so, please describe.

Options available for recessed aeration channels set in concrete or asphalt working pad, or aeration pipes can be placed "on-grade" on top of gravel, concrete or other working pad surface with a slight pitch.

Do you consider this technology part of a larger system that you provide? Yes No If so, please describe.

Yes, as AGT provides modular Compost Aeration and Heat Recovery (CAHR) units with fan, pump, sensors and controls. AGT provides technical services to design and implement new or retrofit improvements to working pad, aeration ductwork, connections to heating loads, drying loops, and other composting process/farm system integrations. Drying and aeration-only systems also offered.

Does your system require any other components that you do not provide or are not included in your proposal? Yes No
If so, please describe.

AGT provides a complete Compost Aeration and Heat Recovery system and recommends other equipment as needed for integration.

How is the system delivered to the site? For example: skid mounted, assembled on site, constructed on site.

The is delivered in modular insulated shipping containers or skid frames and then connected on site.

Is this system portable or configured in such a way that it could be easily transported for use in several locations?

Yes No *If so, please describe.*

Yes at various levels. CAHR unit in cargo trailer is most mobile. Standard CAHR units are delivered on metal skid frame or inside a shipping container. These can be placed in permanent locations but are a recoverable/moveable asset for financing purposes or if site layout changes over time. Batch cycles are typically 4-8 weeks, so equipment would not be moved frequently.

Has your technology been accepted by the NRCS and is it included into a practice standard? Yes No

If so, please describe if necessary.

The system is approved by USDA NRCS – change to “composting” is approved. Also, system has passed NRCS technical review as required for USDA funding through the Rural Development Rural Energy for America Program (REAP). Awards through USDA REAP made in VT, NY and MA.

Are there any unusable or hazardous byproducts of this process? Yes No

If so, please describe the product and recommended means of disposal.

What spare parts and redundant components are included with the system?

Spare parts are industry standard and available. Wear items include blowers, valve actuators and sensors.

How is the system controlled and what are the components and capabilities of the control system?

Each unit has a PLC with a human machine interface (HMI) capable of both on-site touch screen controls or remotely accessible via internet connection. Primary controls include the fan speed (cfm), batch aeration intervals (minutes), exhaust vapor recirculation or direct venting and circulator pump. Sensor inputs of temperature, vapor and water flow rates, vapor O2 levels and other parameters guide the operator making adjustments to the timer and other settings.

What is the usable life of the system?

Designed for a 20-year life with proper service and maintenance

What is the salvage value at the end of the usable life?

Negligible

What is the educational and technical level of competence for the operation of the system?

Trained labor should be able to operate the system. Operator training provided at start-up and for the first year.

What level of maintenance is required for the system?

Please indicate if rebuilds or major components must be replaced and what the frequency is for these components.

Component parts require maintenance and replacement per maintenance schedule. Wear items have 1–5-year typical lifespan.

Are consumables used in the process? Yes No

Please provide the nature and purchase relationship for these consumables. For example: proprietary, special contract, generally available.

Which of these NRCS codes would your technology be classified under? Check all that apply. Add if necessary.

CODE	NRCS DESCRIPTION	CHECK ALL THAT APPLY
472	Access Control	<input type="checkbox"/>
560	Access Road	<input type="checkbox"/>
309	Agrichemical Handling	<input type="checkbox"/>
371	Air Filtration and Scrubbing	<input type="checkbox"/>

591	Amendments for the Treatment of Agricultural Waste	<input type="checkbox"/>
366	Anaerobic Digester	<input type="checkbox"/>
672	Building Envelope Improvement	<input type="checkbox"/>
372	Combustion System Improvement	<input type="checkbox"/>
317	Composting Facility	<input checked="" type="checkbox"/>
554	Drainage Water Management	<input type="checkbox"/>
375	Dust Control from Animal Activity on Open Lot Surfaces	<input type="checkbox"/>
373	Dust Control on Unpaved Roads and Surfaces	<input type="checkbox"/>
374	Farmstead Energy Improvement	<input type="checkbox"/>
512	Forage and Biomass Planting	<input type="checkbox"/>
561	Heavy Use Area Protection	<input type="checkbox"/>
516	Livestock Pipeline	<input type="checkbox"/>
590	Nutrient Management	<input type="checkbox"/>
521A	Pond Sealing or Lining, Flexible Membrane	<input type="checkbox"/>
533	Pumping Plant	<input type="checkbox"/>
588	Roof Runoff Structure	<input type="checkbox"/>
367	Roofs and Covers	<input type="checkbox"/>
318	Short-Term Storage of Animal Waste and By-Products	<input type="checkbox"/>
570	Stormwater Runoff Control	<input type="checkbox"/>
606	Subsurface Drain	<input type="checkbox"/>
635	Vegetated Treatment Area	<input type="checkbox"/>
601	Vegetative Barrier	<input type="checkbox"/>
360	Waste Facility Closure	<input type="checkbox"/>
632	Waste Separation Facility	<input checked="" type="checkbox"/>
313	Waste Storage Facility	<input type="checkbox"/>
634	Waste Transfer	<input type="checkbox"/>
629	Waste Treatment	<input checked="" type="checkbox"/>
359	Waste Treatment Lagoon	<input type="checkbox"/>

Can you provide an estimate of the capital required for the installation of this technology?

Please include all components and designate if provided by you or others.

Capital Estimate for 500 cow dairy – depending on the fraction of manure solids handled, other farm biomass handled in composting system and the amount of integration and infrastructure costs. Projects have ranged from a low of \$120K for basic outdoor working pad with pipes on grade and one HotSkid 250R unit (\$60,500 for AGT equipment). That layout can process 6000 cubic yards annually when loading 125 cubic yards per batch with an eight week retention time. \$900K is the high end for a comparable capacity but using a fully enclosed building, concrete working pad with recessed channels, integration with dewatering equipment and heat recovery. AGT works with clients in planning stage to develop a site-specific capital budget.

Can you provide an estimate of the operational costs required for this technology?

Please include all costs and designate if provided by you or others.

Typical electrical costs are \$300/year (\$25/month) per CAHR unit. 1 to 4 units could be used by a 500 cow dairy, depending on their solids separation practices and composting aeration retention time.

Typical equipment maintenance is \$1000 in labor and replacement of wear-item components, averaged over five years. Tasks include greasing bearings, inspecting valves and pumps and replacement of sensors or valve actuators over time.

Is there financing available for this system? Yes No *If so, what are the conditions for this financing?*

The AGT system qualifies for NRCS EQIP financing. Northland Leasing and Northstar Leasing are among available lenders.

Is the system available for lease? Yes No *If so, please describe.*

Northland Leasing and Northstar Leasing both offer lease options for equipment and related expenses.

What sort of warranty or guarantee do you provide with this technology?

Do you provide any performance guarantees or strictly defects in parts and materials?

5-year warranty provided on primary components of unit and frame. 1 to 2 –year warranties provided by manufacturers of wear items including blower, actuators and circulator pump.

Explain how this system is unique or transformative and how does it improve upon or go beyond other technologies that are currently available.

Farm clients have documented multiple savings and new revenue sources from AGT equipment and installations. Savings include operating labor, reducing space requirements, reducing energy costs for equipment diesel, and propane and heating oil costs for heating facilities, hot water and/or drying products. New revenues sources for some sites include compost sales of material previously land applied as raw manure, waste feed and other biomass.

Would you be willing to provide a location for a site visit by Newtrient? Yes No *If so, please provide location.*

See Below

TECHNOLOGY REFERENCES

Please provide customers with whom we can discuss this technology and its performance.

Include a company name, location, contact name and contact information.

AGT units have been installed at the following farms, with state, start-up date and operational status.

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1. Diamond Hill Custom Heifers, VT, 2006, operated until 2020, farm now sold/owner retired.
2. Sunset View Farm, NY, 2010, down for aeration floor repairs.
3. Jasper Hill Farm, VT, 2012, operating.
4. UNH Bruley-Demeritt Farm, NH, 2013, operating.
5. Vermont Compost Company, VT, 2014, temporary mobile installation to May 2015.
6. Mattapan Ecovation Center (urban farm), MA, 2015, temporary mobile installation to Jan 2017.
7. VernMont Farm, VT, 2016, operating.
8. Foster Brothers Farm/VT Natural Ag Products, VT, 2016.

9. Foster Brothers Farm/VT Natural Ag Products, VT, 2017 (second unit and system expansion).
10. Collins Powder Hill Farm, CT, 2017, operational but farmer operator retiring, looking for new CT Farm Energy host.
11. Gillian Dairy, Petaluma, CA, 2017, aeration-only unit, operating.
12. Arborculture, Wales, UK, 2017. Not operating.
13. Catlin Farmstead, Winchendon, MA, 2019, operating.
14. Country Oaks Landscape Supply, Burton, MI, 2020 operating.
15. Tamarlane Farm, Lyndon, VT, 2020, operating.
16. Magnan Brothers Dairy LLC, Fairfield, VT, 2021, operating.
17. Whitten Family Farm, Winthrop, NY, 2023, operating.
18. YES Compost, Bozeman, MT, 2024, operating.