Georgia Dairy Smart Roadmap

Advancing Sustainable Dairy Practices Across Georgia

January 23, 2026

Roadmap Overview

NEWTRIENT™
INNOVATIVE SOLUTIONS IN RESOURCE RECOVERY

NEWTRIENT'S MISSION

To reduce the environmental footprint of U.S. dairy and make it economically viable to do so

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INNOVATIVE SOLUTIONS IN RESOURCE RECOVERY

NEWTRIENT MEMBERSHIP

Who We Are

Owned by the U.S. Dairy Industry:

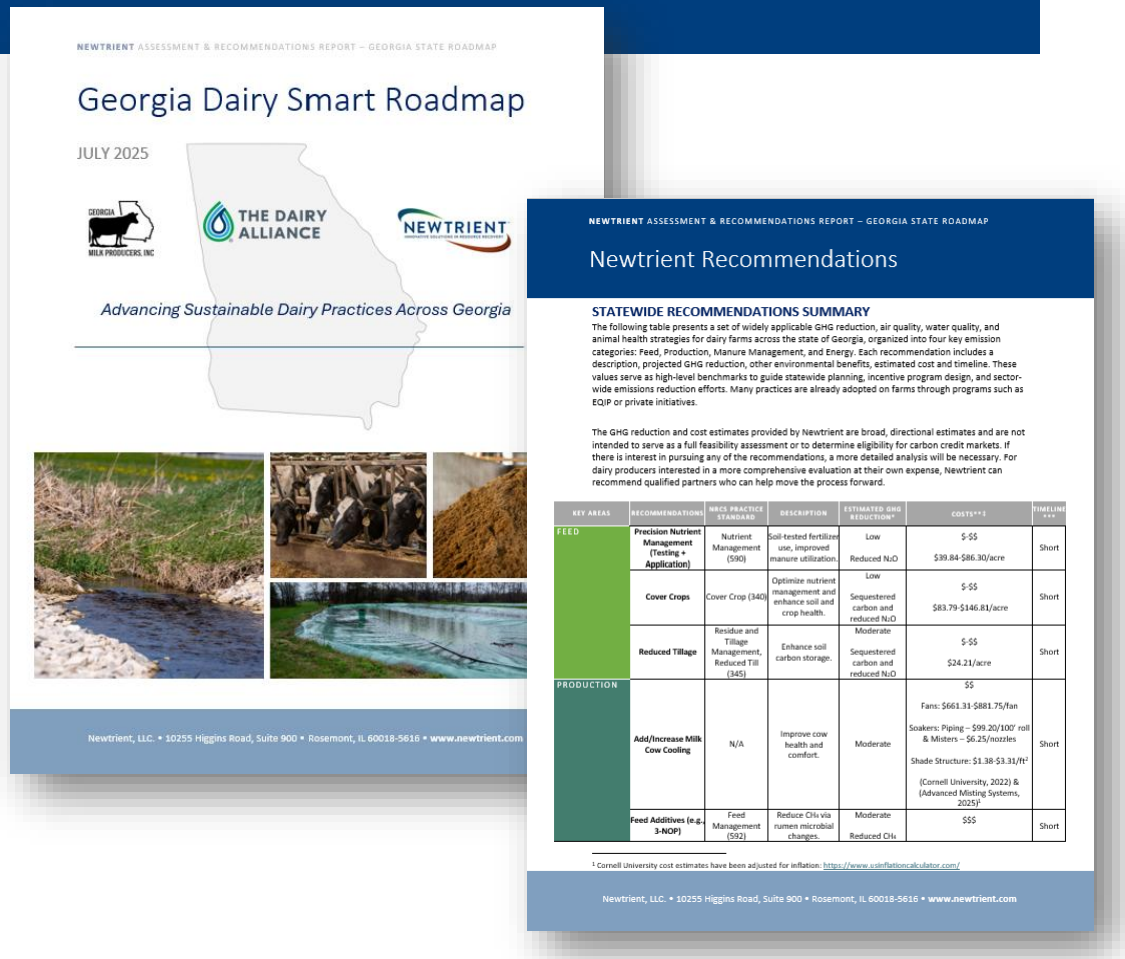
~64% Dairy Cooperatives

~36% National Checkoff

January 23, 2026

WHAT IS THE GEORGIA DAIRY SMART ROADMAP?

- A sustainability assessment of 10 representative Georgia dairies
  - Evaluation of four key areas of the farm: Feed, Production (enteric), Manure, and Energy
- Highlights proven practices that deliver the greatest operational and environmental benefit
- Gives each farm size prioritized recommendations
- Funded by a USDA-NRCS technical assistance grant
- **Goal:** Improve environmental outcomes and maintain farm profitability

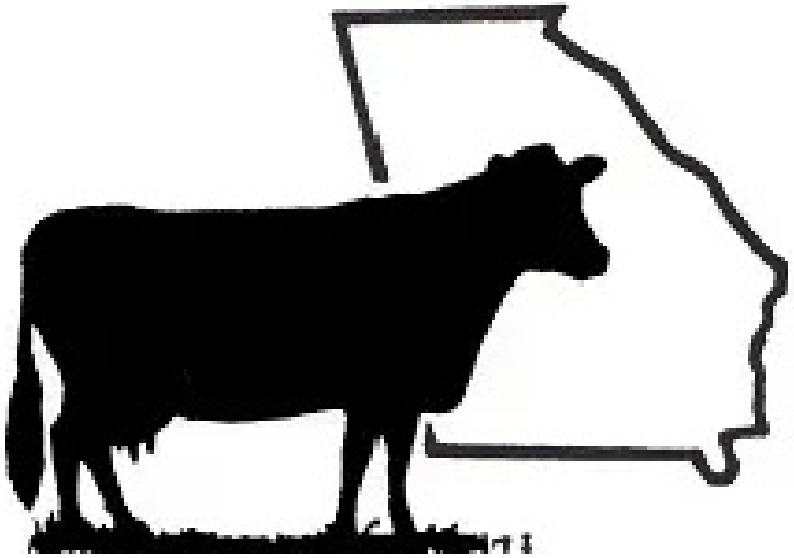


CHALLENGES DRIVING THE NEED FOR A GEORGIA DAIRY ROADMAP

- **Rising regulatory pressure** around manure, nutrients, and GHGs
- Increasing **heat stress risk**
- **High** fertilizer and feed **costs**
- Need to protect **long-term economic viability** as milk production grows in the southeast
- **Limited access** to federal funding, technical assistance, and agriculture engineering
- Producers want **practical and data-driven solutions**, not paperwork
- Roadmap provides **clear, phased actions** that work on Georgia dairies
- Highlights **high-impact investment** opportunities for funders

GEORGIA DAIRY OVERVIEW

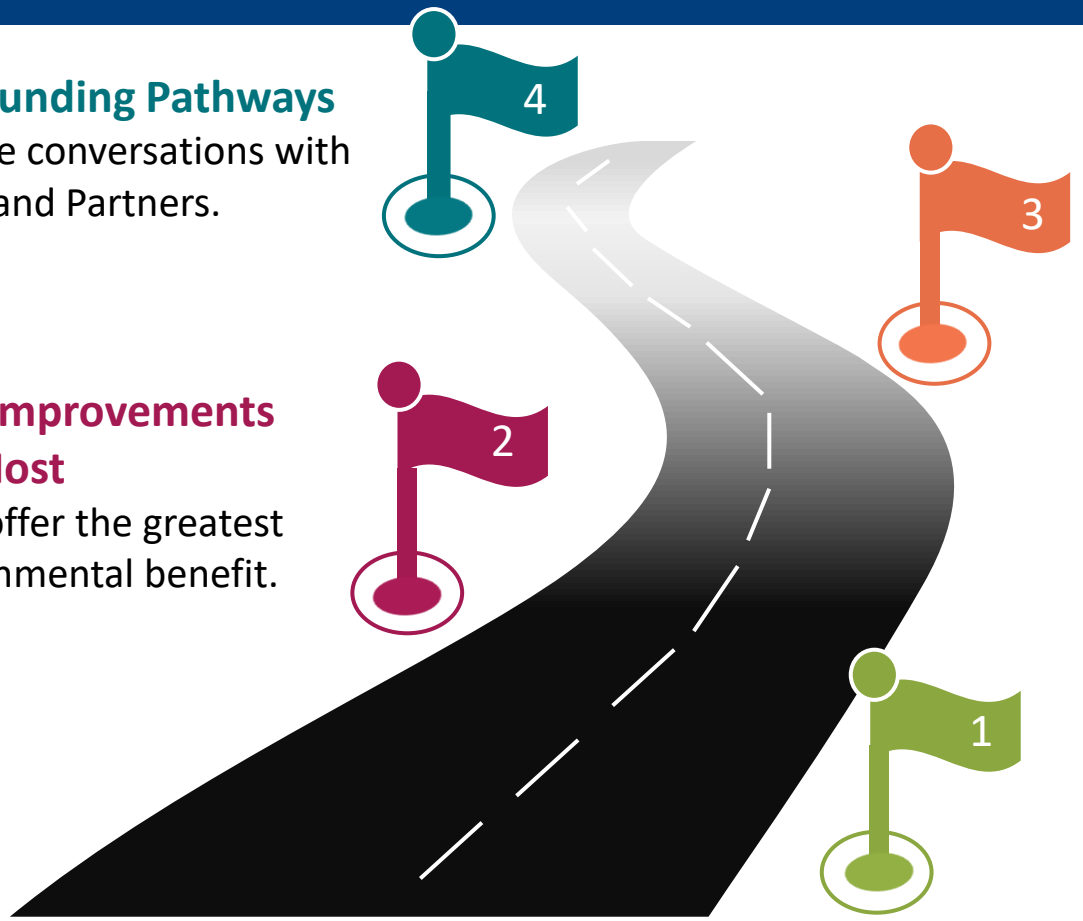
- ~ 74 dairies statewide
- Three major regions: Coastal Plain, Piedmont, Blue Ridge/Ridge & Valley
- 10 farms participated
- Cohorts:
  - Small (< 250 cows): **4 farms**
  - Medium (251-700 cows): **2 farms**
  - Large (> 701 cows): **4 farms**
- Total herd represented: **12,958 cows**
- Total acres: **7,800+**



HOW THIS ROADMAP HELPS YOUR FARM

Access Support and Funding Pathways
Use the Roadmap to guide conversations with NRCS, Extension, and Partners.

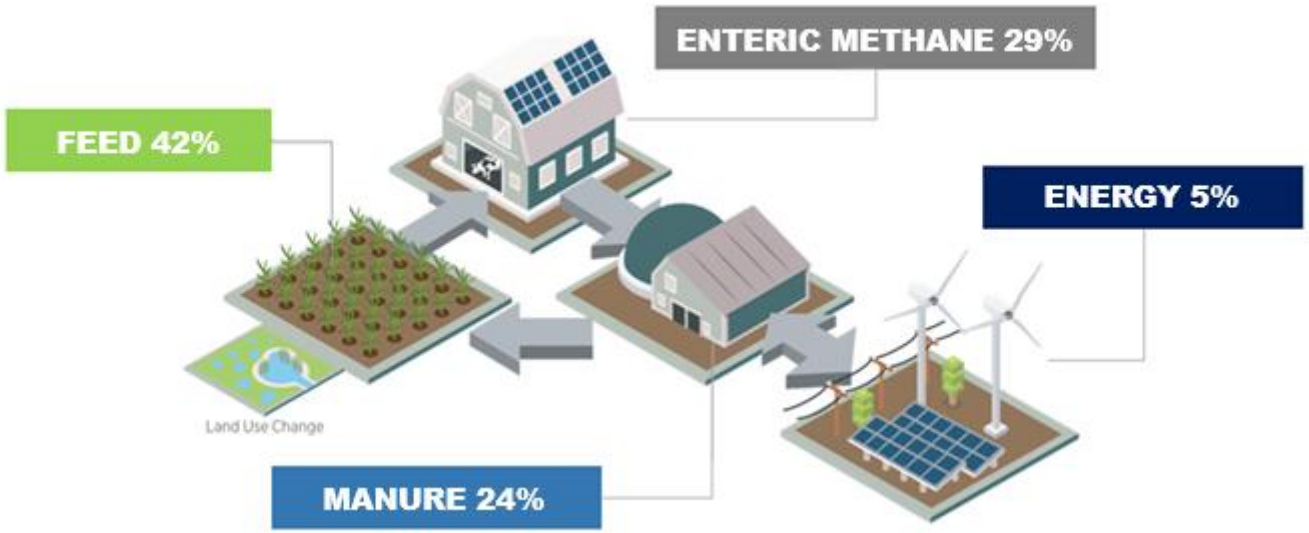
Understand Which Improvements Matter Most
Learn which upgrades offer the greatest operational and environmental benefit.



Know Where To Start
Get a clear starting point for planning and prioritizing improvements.

Identify What Fits Your Farm
See which practices and technologies apply to your farm size and region.

DAIRY'S ENVIRONMENTAL FOOTPRINT



(Calculated from Pelton et. al, 2025. Spatially Resolved Greenhouse Gas Emissions of U.S. Milk Production in 2020. Environ Sci Technol.)

The Average GHG Footprint of a Southeast Dairy Farm

Metric	Southeast	National
GHG Footprint	2.67 lbs. CO_2e/lb. FPCM	2.23 lbs. CO_2e/lb. FPCM
GHG per Cow	23.67 $MTCO_2e$	24.53 $MTCO_2e$
Milk Production	19,000-20,000 lbs./cow/year	24,200 lbs./cow/year
Milk per Cow	63.9 lbs./cow/day	79.3 lbs./cow/day

Lower milk production explains 122% of the observed GHG increase.

Statewide Findings & Priority Recommendations

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LEARNINGS ACROSS GEORGIA DAIRIES

Key Challenges

- Heat stress reduces productivity and increases carbon intensity
- Limited solids separation reduces storage and increases methane
- Manure storage often insufficient for agronomic timing
- Soil and manure testing inconsistent across farms
- Many low-cost, high-impact practices underused
- Economics remain the biggest barrier to adoption

Priority Statewide Recommendations

Feed
Precision nutrient management
Cover crops
Reduced tillage

Production
Milk cow cooling
Feed additives
Precision feeding
Manage grazing

Manure
Coarse/fine solids separation
Waste holding pond
Comprehensive Nutrient Management Plan (CNMP)

Energy
Solar shades/panels
Hot water heat recovery
Energy efficiency upgrades

LARGE FARMS TOP OPPORTUNITIES

Key Areas	Recommendations	Estimated GHG Reduction*	Costs **	Timeline***
Feed	Integrate Manure Application and/or Add Wastewater Center Pivot Irrigation	Low	$$$	Short
	Add Transfer Piping to Pivots/Irrigation System	Low	$$	Midterm
Production	Add/Increase Milk Cow Cooling	Moderate	$$	Short
	Add Freestall Barn(s)	Low to Moderate	$$$$	Midterm
	Convert to Manure Solids for Bedding	Moderate	$$$	Short

NOTES:
*Estimated GHG Reduction: Low = Low Reduction Potential; Moderate = Moderate Reduction Potential; High = High Reduction Potential
**COSTS: $ = MINIMAL INVESTMENT; $$ = MODERATE INVESTMENT; $$$ = SIGNIFICANT INVESTMENT; $$$$ = LARGE-SCALE INVESTMENT
***TIMELINE: SHORT = <12 MONTHS; MIDTERM = 12-24 MONTHS; LONG = >24 MONTHS

LARGE FARMS TOP OPPORTUNITIES

Key Areas	Recommendations	Estimated GHG Reduction*	Costs **	Timeline***
Manure Management	Add/Improve Coarse Solids Separation	Moderate	$$-$$$	Short
	Add/Upgrade Concrete Surface for Solids Management	Low	$$	Short
	Add/Improve Sand Separation	Low	$$-$$$	Short
	Add Waste Holding Pond	Low to Moderate	$$$	Midterm
	Cover Holding Pond and Flare Emissions	High	$$$$	Long

NOTES:
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MEDIUM FARMS TOP OPPORTUNITIES

Key Areas	Recommendations	Estimated GHG Reduction*	Costs **	Timeline***
Feed	Integrate Manure Application and/or Add Wastewater Center Pivot Irrigation	Low	$$$	Short
	Add Transfer Piping to Pivots/Irrigation System	Low	$$	Midterm
	Begin or Increase Cover Crops	Low	$	Short
Production	Add/Increase Milk Cow Cooling	Moderate	$$	Short
	Add Freestall Barn(s)	Low to Moderate	$$$$	Midterm

NOTES:

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MEDIUM FARMS TOP OPPORTUNITIES

Key Areas	Recommendations	Estimated GHG Reduction*	Costs **	Timeline***
Manure Management	Add/Improve Coarse Solids Separation	Moderate	$$-$$$	Short
	Add/Upgrade Concrete Surface for Solids Management	Low	$$	Short
	Add Waste Holding Pond	Low to Moderate	$$$	Midterm
	Add/Upgrade Waste Transfer Pump	Low	$$	Short
Energy	Add Hot Water Heat Recovery	Moderate	$	Short

NOTES:
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SMALL FARMS TOP OPPORTUNITIES

Key Areas	Recommendations	Estimated GHG Reduction*	Costs **	Timeline***
Feed	Integrate Manure Application and/or Add Wastewater Center Pivot Irrigation	Low	$$$	Short
	Add Transfer Piping to Pivots/Irrigation System	Low	$$	Midterm
	Begin Soil and Manure Testing	Low	$	Short
Production	Add/Increase Milk Cow Cooling	Moderate	$$	Short
	Manage Grazing	Moderate	$	Short
	Add Waterers	Low	$$	Midterm

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SMALL FARMS TOP OPPORTUNITIES

Key Areas	Recommendations	Estimated GHG Reduction*	Costs **	Timeline***
Manure Management	Add/Improve Coarse Solids Separation	Moderate	$$-$$$	Short
	Add/Upgrade Concrete Surface for Solids Management	Low	$$	Short
	Add/Upgrade Waste Transfer Pump	Low	$$	Short
	Develop a Comprehensive Nutrient Management Plan (CNMP)	Low	$	Short
Energy	Add Solar Shades	Moderate	$$$$	Long

NOTES:
*Estimated GHG Reduction: Low = Low Reduction Potential; Moderate = Moderate Reduction Potential; High = High Reduction Potential
**COSTS: $ = MINIMAL INVESTMENT; $$ = MODERATE INVESTMENT; $$$ = SIGNIFICANT INVESTMENT; $$$$ = LARGE-SCALE INVESTMENT
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Environmental & Financial Impact

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ENVIRONMENTAL BENEFITS

Across all farm types, the recommended practices improve on-farm efficiency, and those efficiency gains directly translate into better environmental outcomes.

What the improvements deliver:

- **More efficient manure systems** → lower methane from storage
- **Nutrient-use efficiency**→ lower nitrous oxide from soils, reduced runoff and leaching
- **Improved cow comfort**→ increased milk production
- **Healthier, better-managed soils** → increased soil carbon content
- **More efficient energy use and heat recovery** → reduced energy-related GHG

PRODUCER ECONOMICS

The Roadmap emphasizes improvements that:

- Reduce input costs (e.g. fertilizer, bedding, labor)
- Increase milk production
- Lower transport and handling costs
- Improve nutrient-use efficiency
- Offset costs through NRCS and carbon credit programs
- Saves energy or reduce energy costs
- Increase crop yield and quality
- Allow ongoing improvements that build on eachother

POTENTIAL FUNDING AVAILABLE

Federal Programs:

- Conservation Stewardship Program (CSP)
- Environmental Quality Incentives Program (EQIP)
- Georgia Natural Resources Conservation Service

State and Local programs may also be available to provide grants, cost-share programs and low-interest loans

- University of Georgia Cooperative Extension
- Southern Cover Crops Council
- Georgia Association of Conservation Districts
- Southern Sustainable Agriculture Research & Education
- Georgia Power

THE ROLE OF CARBON INSETS

- Dairy Product Companies, our customers, increasingly want to invest in dairy methane reduction
- Inset markets help dairy producers gain **direct revenue** from the dairy product supply chain
- Most promising areas:
  - Manure methane capture
  - Solids separation
  - Feed management
- This is an early but growing long-term opportunity

NEXT STEPS AND ONGOING EFFORTS

- Identify state and national funding opportunities to match recommendations and farmer interests
- Capture farmer-to-farmer and consumer testimonial stories from participating farms
- Advise Southeast NRCS Technical Committee's on barriers dairy farmers face
- Look to expand roadmaps to other Southeast states or dairy producing areas with specific challenges

Newtrient Resources

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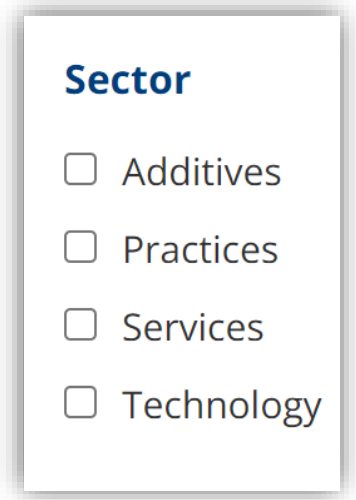
NEWTRIENT SOLUTIONS CATALOG

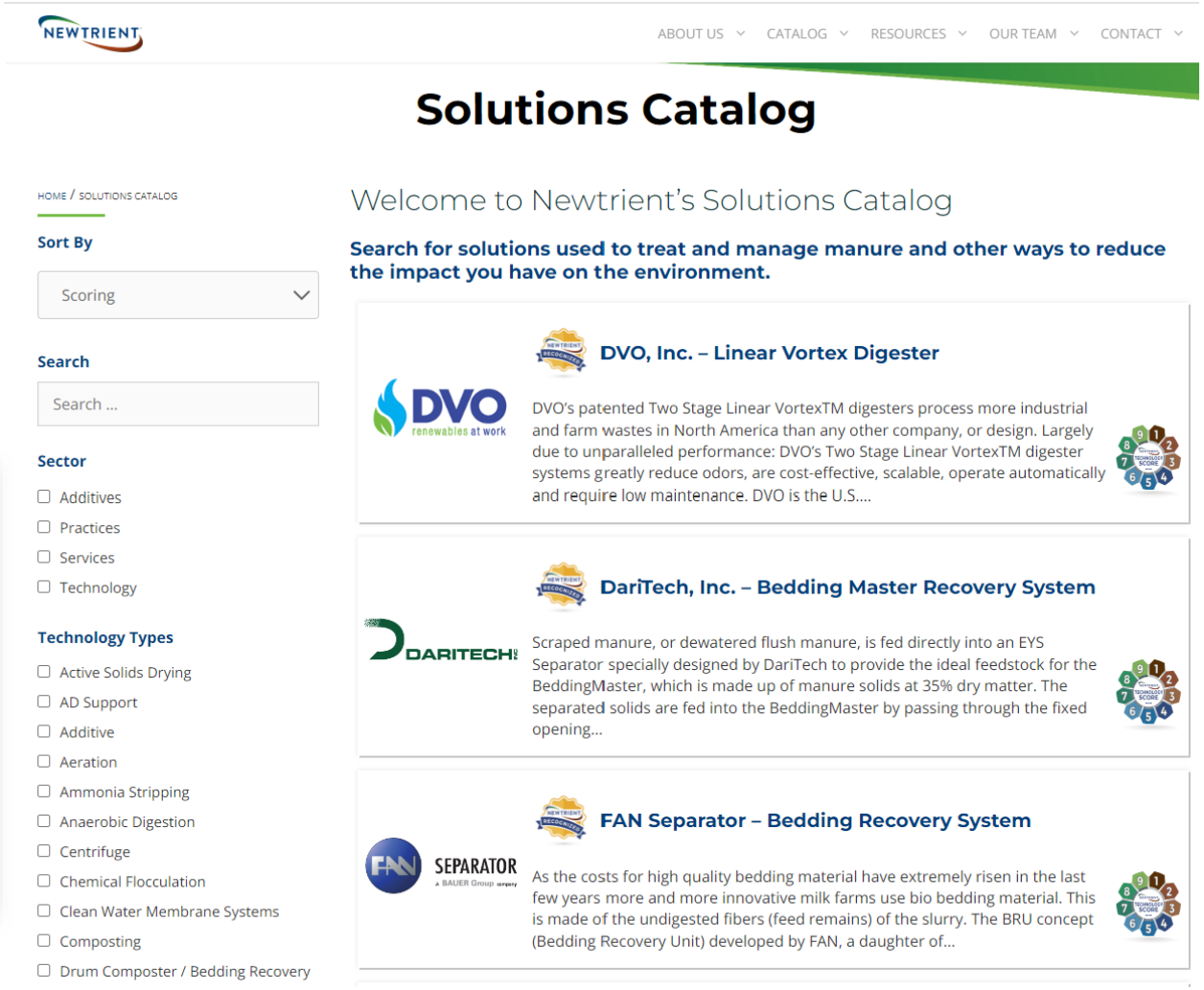
EVOLUTION OF THE SOLUTIONS CATALOG

521 SOLUTIONS

- **40+** Manure Additive Companies
- **50+** NRCS Practice Standards
- **100+** Service Providers
- **300+** Technology

Newtrient Solutions Catalog





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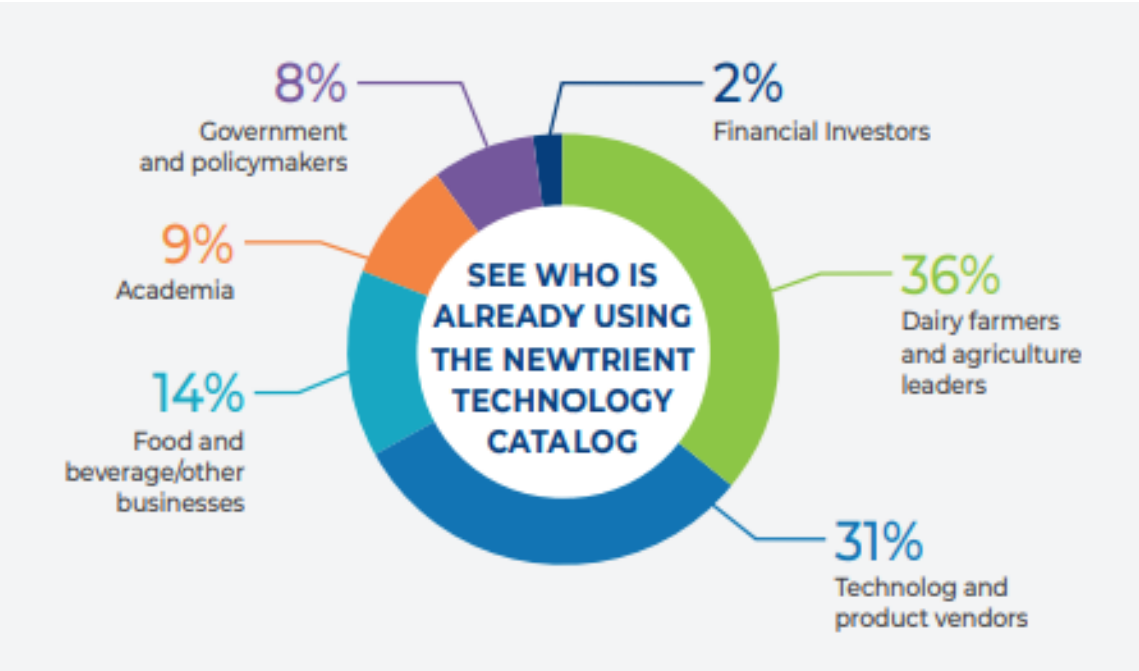
HOW IT WORKS



NEWTRIENT RECOGNIZED

NEWTRIENT EMERGING TECHNOLOGY

NOT VENDOR VERIFIED

Technolog Catalog Vendor Page Details

Technology Vendor Information
Access company information and background.

Technology Description
Understand the technology and what it will do for you.

Technology Reviews
Get insight into how the technology works.

9-Point Scoring System
Get a quick look at how we've rated the technology based on operational and financial viability.

Newtrient Recognized Designation Seal
Given only to the top-performing technologies.

Business Insights, Technical Insights, Case Studies, and Photos
Download additional information about the technology and how its worked on other dairy farms.

NEW!
Critical Environmental Indicators
See how a technology rates on factors most important to your farm – odor reduction, pathogen control, GHG reduction, phosphorus recovery and more.

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RESOURCES & OUTREACH


NEWTRIENT SNAPSHOT

Agrilab Technologies Inc.
Compost Aeration and Heat Recovery (CAHR) Technology

agrilab TECHNOLOGIES

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/yd³, a typical batch size of feedstock ranges from 110 to 300 yd³, depending on the mixture. The most popular equipment models can accommodate operations with feedstock volumes ranging from 1,000 to 30,000 yd³/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 yd³/year, or the larger modular units can process over 100,000 yd³/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.

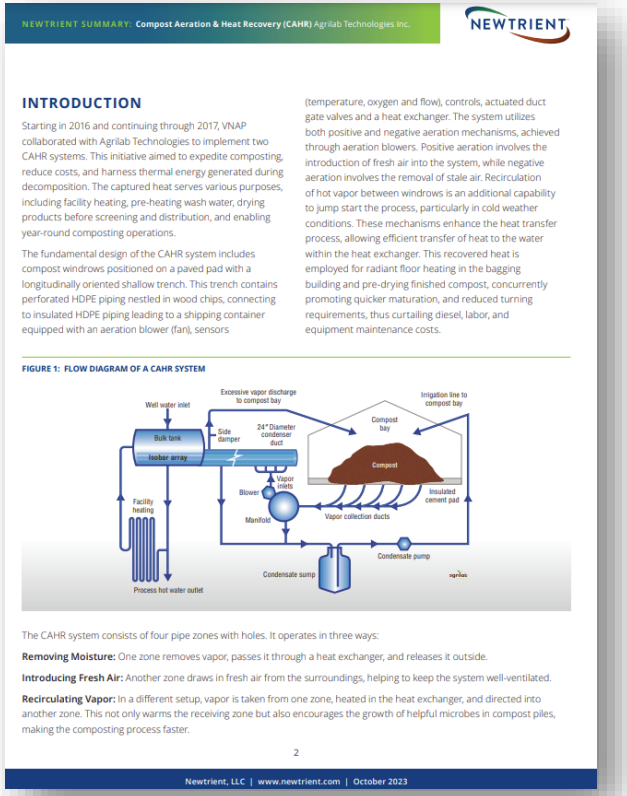
Accelerated Compost: Compost treated with a CAHR system was suitable for market in approximately 25-75% of the time as conventionally turned windrows, with less nitrogen loss.

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.

Newtrient, LLC | www.newtrient.com | October 2023

Vendor Snapshots


NEWTRIENT SUMMARY: Compost Aeration & Heat Recovery (CAHR) Agrilab Technologies Inc.

INTRODUCTION

Starting in 2016 and continuing through 2017, VNAP collaborated with Agrilab Technologies to implement two CAHR systems. This initiative aimed to expedite composting, reduce costs, and harness thermal energy generated during decomposition. The captured heat serves various purposes, including facility heating, pre-heating wash water, drying products before screening and distribution, and enabling year-round composting operations.

The fundamental design of the CAHR system includes compost windrows positioned on a paved pad with a longitudinally oriented shallow trench. This trench contains perforated HDPE piping nestled in wood chips, connecting to insulated HDPE piping leading to a shipping container equipped with an aeration blower (fan), sensors (temperature, oxygen and flow), controls, actuated duct gate valves and a heat exchanger. The system utilizes both positive and negative aeration mechanisms, achieved through aeration blowers. Positive aeration involves the introduction of fresh air into the system, while negative aeration involves the removal of stale air. Recirculation of hot vapor between windrows is an additional capability to jump start the process, particularly in cold weather conditions. These mechanisms enhance the heat transfer process, allowing efficient transfer of heat to the water within the heat exchanger. This recovered heat is employed for radiant floor heating in the bagging building and pre-drying finished compost, concurrently promoting quicker maturation, and reduced turning requirements, thus curtailing diesel, labor, and equipment maintenance costs.

FIGURE 1: FLOW DIAGRAM OF A CAHR SYSTEM

The CAHR system consists of four pipe zones with holes. It operates in three ways:

Removing Moisture: One zone removes vapor, passes it through a heat exchanger, and releases it outside.

Introducing Fresh Air: Another zone draws in fresh air from the surroundings, helping to keep the system well-ventilated.

Recirculating Vapor: In a different setup, vapor is taken from one zone, heated in the heat exchanger, and directed into another zone. This not only warms the receiving zone but also encourages the growth of helpful microbes in compost piles, making the composting process faster.

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Newtrient, LLC | www.newtrient.com | October 2023

Evaluation Summaries


NEWTRIENT

APPLICATION FOR COMPONENT ADDITION TO NRCS

NRCS Practice Standard 317 (Evaluation Followed Process Standard 629 Protocol)

For Acceptance of Compost Aeration

STUDY PREPARED BY:

Mark Stoermann
Newtrient Technology Advancement Team

June 2022

Comprehensive Reports

www.newtrient.com

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RESOURCE LIBRARY

BLOG

January 23, 2026

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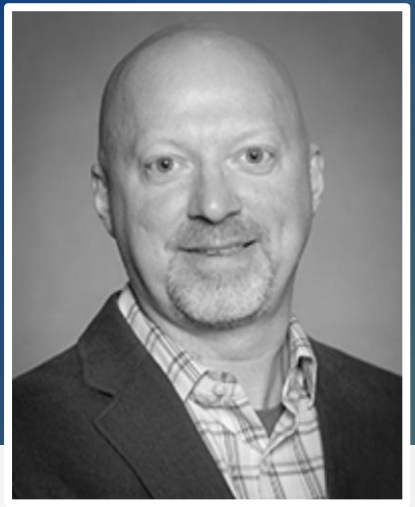
January 23, 2026

NEWTRIENT TEAM



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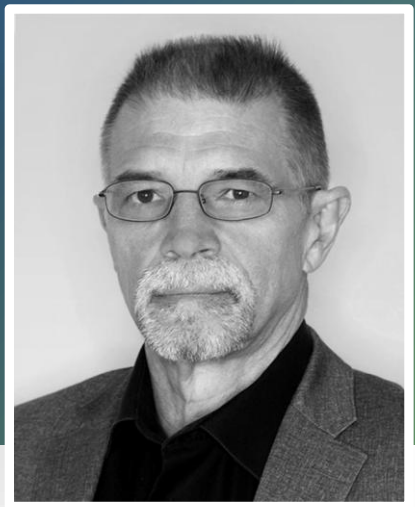

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Questions?

October 20, 2024