



CALIFORNIA DAIRY
RESEARCH FOUNDATION
Science for a Sustainable Future

**CDRF-Commissioned
California Manure Market Analysis
Project Summary**

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LPELC Webinar - Successful Strategies for Transferring Manure
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What, why, & by who

- ▶ California dairy produces a significant amount of manure
- ▶ large amounts may need to be moved off farm to meet tightening water quality requirements
- ▶ Substantial cropland in California
- ▶ A manure market analysis: enhance the value & identify potential technical solutions/strategies
- ▶ Research team: foodminds | kynetec | NEWTRIENT | COGENT





What did they do?

- ▶ High level interviews: fertilizer manufacturers, blenders, crop input retailers & crop consultants
 - ▶ Current fertilizer production practices, needs/motivations for inputs and products, barriers with current solutions/manure products
- ▶ Deep dive interviews: California growers, fertilizer/compost suppliers, and dairy producers
- ▶ Identified regs impacting manure & fertilizer products
- ▶ Evaluated potential advanced treatment technologies
- ▶ Surveyed California growers - acquired reactions to potential products and market sizing






What did they find?

- ▶ An informal, peer-to-peer market for dairy manure/manure compost exists, increasing opportunity for market expansion
- ▶ There are several barriers to use:
 - ▶ low NPK value
 - ▶ State/company restrictions due to potential pathogen outbreak
 - ▶ customer perceptions & food safety requirements
 - ▶ availability & affordability of products




- ▶ Multiple trends creating growing market potential
 - ▶ Regulatory/non-regulatory pressure on synthetic fertilizer industry
 - ▶ Growing awareness of need to improve soil health
 - ▶ Expansion/expected growth in organic & sustainability seekers
 - ▶ Challenges with applying other forms of animal & human waste on ag lands
- ▶ Manure has significant agronomic value that can be further developed through more systematic, customer-driven production and distribution





Market Relevant, Scalable, Processing Technologies





- ▶ Compost
- ▶ DAF and Evaporative Technologies
 - ▶ Dissolved Air Floatation (DAF) Technology: dewatered solids (@ 20-25 % DM) and tea water
 - ▶ Thermal Evaporative Processing (TEP) Technology: 90% DM product + aqueous ammonia
- ▶ Potential to separate & concentrate nutrients
- ▶ Solids products can be pelletized



Feed your soil and crops with enhanced dairy-based composts and fertilizers



DAIRY MANURE NUTRIENT SYSTEMS
POWERED BY DAIRY MANURE COMPOSTS & FERTILIZERS

	Composts			Fertilizer											
	Standard	Enhanced	High-Nutrient	15% Aqueous Ammonia											
															
	N	P	K	Ca	N	P	K	Ca	N	P	K	Ca	N	P	K
100% Dairy Manure (Fertilizer not mixed with other wastes)	2	2	2	40+	3.5	3.5	1	88+	5	4	6	88+	12	0	0
Higher nutrient levels, relative to standard compost	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Certified Organic	✓	✓	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Certified Pathogen Free	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Pelleted	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Fertilizer-ready													✓	✓	





* The enhanced compost is processed using a polymer flocculant, the inclusion of which prevents it from being certified as organic.

Some Initial Reactions

TOPLINE MARKET RESEARCH REPORT

Summary of Dairy Manure Nutrient Systems product performance

- 87% of the respondents indicated they would use at least one of the products from the Dairy Manure Nutrient Systems line - only 11% were not interested in using any of the items in the line.
- 42% of respondents indicated an interest in using more than one item in the line.
- The highest priced compost (high-nutrient), priced at over twice that of standard compost still managed to generate usage intent from over one-third of the growers.

	Composts			Fertilizer											
	Standard	Enhanced	High-Nutrient	15% Aqueous Ammonia											
															
	N	P	K	Ca	N	P	K	Ca	N	P	K	Ca	N	P	K
7 to 10 Rating Overall Impression	49%	58%	72%	60%											
Top 3 Use Rating Need on my farm	37%	46%	57%	34%											
Top 3 Use Rating Likelihood to use (per price)	47%	53%	70%	46%											
Will use at price point	45%	42%	35%	40%											
Price point†	\$30 to \$40/ton*	\$75/ton	\$125/ton	\$2.82/gal											

* Price for the standard compost was set based on what the respondent was already paying for their compost.

What are end-users looking for?

- ✓ Certified/consistent quality
- ✓ Weed free
- ✓ Pathogen free
- ✓ Easy to transport
- ✓ Easy to apply
- ✓ "Affordable"

Potential Next Steps...

- ▶ Characterize the composition of manure streams (goal: identify how to add technology to reduce water input to 5-6% total solids)
- ▶ Pilot tests to validate technology - costs, operational impacts, consistent product quality, etc.



Thank You!