

*Industry's Most Advanced Technology.
Experience, Not Experiments.*



NUTRIENT RECOVERY

Advanced Technology for Agriculture



EXECUTIVE SUMMARY

Advanced Nutrient Recovery
Technology for Ag Wastes

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NUTRIENT RECOVERY

ADVANCED TECHNOLOGIES FOR AGRICULTURE



Executive Summary

For centuries disposal of farm manure was solved by simply spreading it on the land as natural organic fertilizer. Today, though still practiced, that is no longer considered the best solution. In fact, it is now understood to contribute to a global problem. Farmland is becoming so overloaded with nutrients it is creating serious ramifications for watersheds on ag lands. The algae blooms of Lake Michigan covering up to 50% of the lake in summer, graphically illustrates the extent of the problem. Around the world, this is a growing concern. Farmers and regulators are under real pressure to find better ways to manage the growing problem. All invested parties are looking to advanced technology.

Trident Processes LLC has developed the Trident Nutrient Recovery System, an award winning manure management process that is now commercially installed on farms in Canada and the USA. The system provides a complete manure management solution for farmers including many benefits that reduce overall manure operation costs, including: concentrated nutrients for export, bedding fiber and clean water for reuse and reduced transportation and handling costs.

Trident's systems are being developed to reach a broad target market, custom sized for affordability and completely automated for efficient, economical use.

Advanced Nutrient Recovery Technology for Ag Wastes

“ Our expectation is that the Trident system as it affects the various component costs of our entire manure management ecosystem is going to bring our costs down by at least one-third. So, the economics look promising.”

Dr. Michael McCloskey
CEO, Fair Oaks Farms
Fair Oaks, Indiana



Nutrient Recovery on Seabreeze Farm 300-cow Dairy, Delta, BC.

Farm Benefits:

- ▶ Complete automation of manure system.
- ▶ Reduced bedding costs.
- ▶ Significant transport cost savings.
- ▶ New nutrient format for precision Ag-application.
- ▶ Accelerated farm growth without additional land purchase.
- ▶ Reduced risk from a lagoon breach.
- ▶ Clean flush water.



Dry fiber recycled from manure, superb for barn stall bedding.

Management Team

Trident has assembled a strategic team with many years of experience in the Ag-sector. These include farm equipment sales, marketing and advertising; equipment design, engineering and manufacturing; fluid materials handling and process engineering and project management. Founder, Kerry Doyle, was the developer of the original Rotary Screen Separator now sold around the world and has been a leader in the development of manure handling and processing systems for over 20 years.

Strategic Partners

Trident continues to develop its technology through strategic partnerships including: process engineers, ag-scientists, equipment dealers and the farmers themselves. We are a key partner in a major nutrient recovery study administered by the University of Wisconsin and funded by the USDA the results of which validated the process and from which the primary system design originates.



Lab testing polymer formulations for the nutrient recovery process.

Farmers who manufacture their own “bedding” save more

One of the unique features of the Trident Nutrient Recovery System is the inclusion of Trident’s Bedding Recovery System, a process that recycles the large fiber from manure the farmer can use as barn stall bedding. This free and abundant recycled fiber is an ideal substitute for organic material farmers purchase from outside suppliers. What makes the Trident Bedding System unique is its’ ability to breakdown manure’s viscous mucoid structure and remove fine particles prior to large fiber extraction enabling the harvest of truly premium bedding, and not just dried manure.

Bedding Cost Recovery

Recycling fiber as bedding represents a significant cost savings for farmers and a significant contributor to the ROI of the nutrient recovery system. The past few years, cost of premium bedding has risen steadily, causing many farmers to either re-bed less often or look for cheaper material alternatives. This can have detrimental affects on cow health and comfort reducing milk production. Manufacturing bedding from manure provides ample bedding material to allow farmers to bed deep and bed often, a key component to keeping cows healthy, comfortable and productive.

A Note on Pathogens in Recycled Bedding

Studies by Cornell University regarding pathogens related to use of non-pasteurized green bedding have indicated that cow health is not adversely affected. In fact, in some cases, depending on farm bedding practices, there were health improvements after green bedding was implemented. There were also cases of increased milk production, which was attributed to the volume of bedding giving the farmer opportunity to bed deeply and more often.

Stage of Development

The Nutrient Recovery System is now fully commercialized and in-stalled in the USA and Canada.

2015 - Nutrient Recovery for 15,000 cow dairy with digester at Fair Oaks Farms, Fair Oaks, IN.

2015 - Nutrient Recovery for 300 cow dairy with anaerobic digester, Delta, BC.

2014 - Fiber Recovery for 5000 cow dairy in Dong-Jun Nei Meng Gu Co., Ltd in Linhe City, Shandong, China.

2013 - Fiber Recovery for 9000 cow dairy with anaerobic digestion, Rosendale, WI.

2013 - Nutrient Recovery with anaerobic digestion 4000 cow dairy, Manitowoc, WI.

2012 - Nutrient Recovery (major pilot project), 4000 cow dairy, USDA, University of Wisconsin, WI.

Agricultural Nutrient Recovery

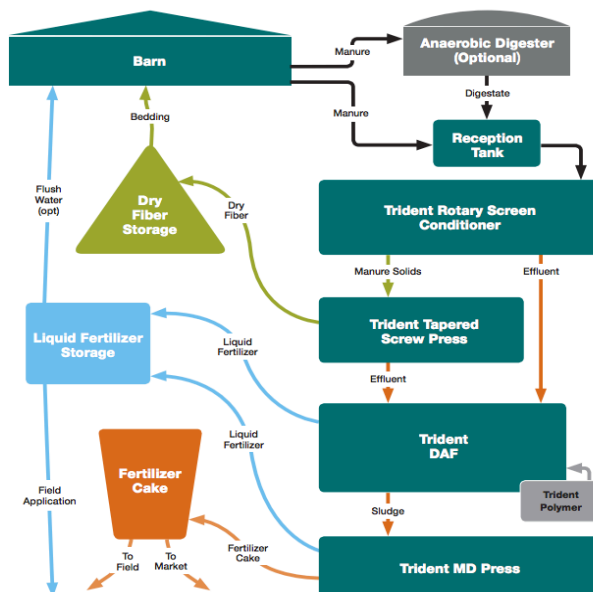
Nutrient management is foremost on the minds of intensive livestock producers. Effectively managing nutrients from animal manure serves the environment and provides solid business opportunities for the producer. The Trident Nutrient Recovery System is a comprehensive solution that is affordable and easy to manage. It is available today commercially as a proven, cost effective technology.

The system's multi-step process generates cost savings and revenue potential all along each step. Breaking the process into steps ensures simplicity and ease of operation. Incorporating farm-ready equipment and components allows for both lower capital layout and lower cost of operation and maintenance.

The system's total automation ensures seamless operation. Continuous monitoring optimized the process with split-second adjustments which maximize performance and provides worry-free operations.

The benefits include increased crop yields by enabling controlled land applications of liquid and solid manure fractions; an extension of the time-window for nutrient land application. Together, these virtually eliminate the risk of uncontrolled nutrient transfer and run-off. Additionally, costs for commercial fertilizer are reduced, as is the farm's carbon footprint.

The Trident Complete Manure Management System



THE BENEFITS OF NUTRIENT RECOVERY

- Capture Fiber for 100% of farm's bedding needs.
- Recovery NPK Nutrients: P85% / N55% / K20% / S80%
- Recycle 90% of the farm's operational water
- Reduce hauling by 80%
- Enable farm growth on existing land-base
- Increase crop yield
- Meet or exceed Nutrient Management Plan requirements