

Nutrient Recovery



Trident MD Press for large scale dairy

"We are changing the way manure is treated" says Kerry Doyle, president of Manure Systems Inc. Developing the system on a large dairy operation provides the economy of scale to optimize the first system. Ultimately scalability is the priority; to take this process to dairies of 500 cows or less is the goal.

Dr. Aicardo Roa, a scientist and owner of Solinet LLC in Belleville, WI, who helped develop the Trident system said it differs from other manure management systems in that it leaves farmers with clarified recycled water for irrigation, concentrated nutrients and excellent quality bedding material. Dr. Roa worked with a team from UW-Madison headed by biochemistry professor John Markley to help land the \$7.5 million grant from the Department of Energy. The grant will help make the system available to the dairy industry and keep the UW-Madison involved in the development of needed technologies.

The project uses the Trident Nutrient Recovery and the Trident Bedding Recovery system both from Manure Systems Inc. The nutrient recovery system is designed to enable dairy farmers to extract the nutrients on a daily basis from their animal manure.

Manure Systems Inc. of Abbotsford, B.C., and recipient of the 2014 Abbotsford Environmental Leadership Award will be showcasing their Rosendale dairy UW – OSHKOSH project this year. With the assistance from a team of UW – Madison scientists, Soilnet LLC and Braun Electric, the project is developing the Trident Nutrient Technology (TNT) Recovery System; a unique system that affordably addresses all aspects of manure management. It dramatically reduces all costs associated with the land application, maximizing the nutrient and water resource contained in manure. The system creates revenue potential for off farm export of nutrients for commercial purposes. The project also encompasses third party verification of the Trident Bedding Recovery system and several biofuel initiatives that are designed and built for the dairy industry.

Once nutrients from the manure are captured they are concentrated into a fertilizer cake that can be easily stored for on-farm use or sold. The Trident bedding system allows farmers to create bedding out of the large fibers that remain after the manure is stripped clean of the nutrients. "The Trident Bedding System saves farmers money and recycles manure material into something valuable," says Doyle. The bedding system leaves nutrients behind which are concentrated in the sludge part of the manure. Extracting and concentrating these nutrients is the final step of the process. The only other by-

product produced is clarified and nutrient-deplete liquid effluent that can be used as a high-quality flush liquid or applied to the land with irrigation equipment.

The Trident systems are fully automated and a combination of proven mechanical and chemical technologies.



Kerry Doyle with an MD Press

Nutrient Recovery



Clarified effluent

The plug-and-play configuration makes it suitable for new or existing dairies and provides a manure management solution that helps dairymen meet their nutrient management plan and maximize their profit potential. The system can be delivered anywhere in the world and is supported by a global dealer network.

In 2013 Doyle further announced a joint venture with TD Precision Steelworks Ltd. a manufacturer in Abbotsford, BC that will build manure and nutrient management systems in Canada for Canadian dairies. The joint venture will be housed in a new facility that will support in-house engineering, administration and sales staff. "It's a great fit for us," says Doyle, "TD Precision Steelworks has an ideal combination of both manufacturing and design skills. They also have key business connections that can help us develop our product. Their agricultural industry experience is a huge asset for us."

TD Precision Steelworks is equally excited about the expansion announcement. "This joint venture takes our business growth to the next level and requires us to get into a bigger facility sooner," explains Tylor Donnelly, President of TD Precision Steelworks, "Though we won't build exclusively for Trident, they certainly provide a great anchor client and we see huge upside potential for what they want to do globally, even outside the ag-industry."

Trident Bedding System

The turnkey Trident Bedding System is a fully automated containerized system that converts raw manure into safe, reusable, high quality, low cost bedding material. The modular system has a very small footprint and is geared to provide an affordable solu-

tion for 1000 cow or less operations. Using a patent pending processor the system recovers only the large coarse fiber in manure, removing the sludge, nutrients and liquid using a conditioning feature exclusive to Trident. The cleaned recovered fiber is then press dried, and is ready for immediate use as bedding material, the need for pasteurizing or composting eliminated by the conditioning process. The removed sludge and liquid is sent to storage or for further processing. Containerization is a key making the Trident system shippable anywhere in the world, once on site and placed in position the container becomes the housing unit. Simply plug in the electrical service to the pre wired automated control system, connect the manure delivery line, turn on the system and start making bedding.

Unique, affordable, effective, turnkey

Trident is a turnkey package that provides an affordable, safe method of producing recovered bedding from dairy manure. Its proven mechanical technologies are energy efficient and reliable providing very low operating and maintenance costs. It offers small scale dairies an effective and affordable alternative to the existing high cost, cumbersome and maintenance prone drum composter bedding recovery systems.



High quality recovered bedding

Containerized, the system is shipped in its own housing unit dramatically reducing if not completely eliminating onsite construction costs. ROI is quickly realized by eliminating monthly bedding purchases. In most cases the Trident system produces more bedding than is required by the dairy providing a revenue opportunity for off farm sales of fibre. Land application of the remaining liquids with its dramatically reduced solids contents means applications become simpler, more economical and better for the grasslands.



Nutrient rich solid cake

Trident Nutrient Recovery System

The Trident Nutrient Recovery System (TNRS) is a new treatment process for dairy farms which segregates the nutrients in cow manure transforming them into value-added, reusable and saleable products. The system reduces manure handling production costs and virtually eliminates environmental land risks; tanker truck transportation is reduced up to 80 percent. The process increases potential crop yields by enabling controlled applications of both liquid and solid manure fractions and extending the time window for nutrient land application and risk of uncontrolled nutrient transfer and run-off are almost eliminated. Additionally, commercial fertilizer costs and the farm's carbon footprint are reduced.

The entire process is simple to use; optimized for efficiency through fully controlled PLC systems, including remote access via the internet and providing important system diagnostics and valuable data for advanced farm management.

Reductions of up to 500% in hauling costs can be achieved by concentrating nutrients into a sludge that will be 20% of the total initial volume. The system routinely captures 45%N, 85%P and 20%K. The remaining nutrient deplete liquid fraction has dramatically reduced solids content. This clarified effluent can be used as a high quality flush liquid or land applied via approved automated irrigation equipment.



604.330.2500 • 1.800.799.3740
info@manuresystemsinc.com
3046 McMillan Road Abbotsford, B.C.
Canada V2S 6A8