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Re: Manning Innovation Awards

Bioenterprise Corporation is a business accelerator organization funded by OMAFRA and Agriculture Canada to provide commercialization assistance to entrepreneurs with new and innovative technologies with a strong link to agriculture.

We were introduced to Ivan Milin and his “Milinator” technology in 2009 and have worked with the company with a view to assisting in its continued development and ultimate commercialization of his business model.

Highlights of the Technology and its development

The technology:

The initial technology, developed by the Russian Space Agency laboratories, involves the processing of a variety of organic wastes by using fly larvae to quickly digest and render it into usable and valuable fertilizer. An Eastern European prototype system was developed specifically to solve waste recycling problems associated with prolonged space flight.

Ivan Milin has re-engineered the Eastern European Prototype into an efficient and scalable solution for farm waste management and has patented the new processes. The re-engineered Milinator system employs the following engineering developments which form the foundation of the patents:

- an air flow management system which provides air flow consistently to all stages of the process

Uniqueness and Innovation

- The reaction vessels of the system are very long and narrow. Ventilation across the narrow side gives a big advantage of having virtually uniform air quality at the beginning and at the end of air flow. This feature allows the reaction vessels to be of unlimited length without affecting the efficiency of the process or quality of the final products.

- an overlapping stack of horizontal belts that manage the manure substrate through a descent from a top-load start through bottom-discharge completion

Uniqueness and Innovation

- The unique modification of conveyor belts with scraper placed on the opposite side of the belt drum, allows for maximum stacking without any space between them. This feature contributes to the maximum efficiency of the system improving the production capacity several times compared to the European plant.

- a system design of holding tanks and substrate depositor
 - Uniqueness and Innovation
 - provides for the servicing of multiple lines and allows for scalability
- a larvae feeding system design
 - Uniqueness and Innovation
 - provides for automation of the process

Development:

A bench scale setup is currently operating at the University of Guelph's Arkell Research Station. This batch simulator is producing examples of end products for testing and evaluation and also emulates future working models with respect to air, temperature and moisture management. The Arkell Prototype also has a hub of sealed Insectariums used to produce batches of fly eggs essential to the process. The work at Arkell is establishing baselines for fly egg production, egg to raw manure ratios, optimal processing volumes and processing speed.

Benefits

The technology developed and currently in prototype has the potential to provide a highly effective method of managing on-farm manure with reduced production of greenhouse gasses and improved residual soil amendment output. The technology with various modifications could be applied to any manure management requirement. This could provide a cost effective solution for operations that would not find the economy in other technologies such as anaerobic digestion.

Ivan Milin has been instrumental and successful in demonstrating on a bench scale level the efficacy of the process and is working with the University of Guelph to quantify process parameters and output values to establish the foundation for a commercialization of this technology. He has developed a system design that is patented and permits scalability, both of which are integral to the impending successful commercialization of the "Milinator".

Bioenterprise Corporation has been working with Ivan Milin in the development of a business model that would be most successful in the commercialization rollout phase of his technology.

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