

## Agricultural By-Products Processing Research and Demonstration Facility

*An initiative of Manitoba Pork and the National Centre for Livestock and the Environment (NCLE) at the University of Manitoba's Glenlea Research Station*

The Agricultural By-Products Processing Research and Demonstration Facility will complement the existing equipment and facilities used by the National Centre for Livestock and the Environment and its partners. The facility will enable on-farm processing and utilization of liquid and solid agricultural by-products from livestock production, such as manure and mortalities, as well as from fibre and biofuel processing - adding value to materials that are otherwise viewed as "waste."

A close working relationship between industry, government and university partners using this facility is expected to streamline the connections between research & innovation, technique & technology transfer and education & training, to capitalize on new opportunities for processing these byproducts. The facility will function as a hub where a variety of interested parties can converge and connect, facilitating the development and flow of information and technology between researchers, manufacturers, government extension bodies, bio-processors and agriculture producers. The common goal is long term economic growth and diversification of the agriculture sector, environmentally sustainable agricultural production, and healthy, stable rural communities.

### Summary of infrastructure

The infrastructure consists of equipment for processing and handling liquid and solid biomass, including solid/liquid separation and solids composting; on-site greenhouse gas and environmental monitoring equipment; as well as open-air and controlled-environment research and demonstration/training sites.



A solid/liquid centrifuge for processing raw and anaerobically digested liquid manure is one piece of funded equipment.

### The research team

The multi-disciplinary team leading the development of the facility and the research program consists of: Don Flaten, Chair of NCLE and nutrient management researcher; Nazim Cicek, biosystems engineer specializing in generating value from "waste"; Kathy Buckley with AAFC in Brandon who is well known and well-respected for her extensive work with compost; Mario Tenuta, CRC chair in soil ecology and soil GHG emissions specialist; Francis Zvomuya who brings his phyto-remediation expertise to the team; Denis Krause, environmental microbiology and livestock pathogens scientist; and agricultural economist, Derek Brewin.

Our team also consists of industry and government partners, whether involved directly at a project level or in general support of our initiatives. For example, Manitoba Agriculture, Food and Rural Initiatives (MAFRI), Manitoba Pork, Keystone Agriculture Producers, Dairy Farmers of Manitoba as well as two manufacturing companies, Leon's Manufacturing and Phason Inc. have indicated their support of this Facility and the accompanying commercially significant research, product development and technology transfer opportunities for strengthening economic diversity and stability in rural communities. To complete the research → producer adoption pathway, we are exploring ways of working with organizations such as the Agri-Environment Services Branch of Agriculture and Agri-Food

Canada and the newly formed Manitoba Composting Association.

## Summary of anticipated benefits and performance

The research and development proposed for this facility encompasses new or value-added products and services, plus improved environmental sustainability and human health. Rural economic development and diversification opportunities linked to this proposal include adding or capturing value from agricultural byproducts through sustainable livestock production, biomass processing and equipment manufacturing. The expanded infrastructure and research capabilities will also facilitate training of highly qualified people to contribute to sustainable economic development into the future.

The research planned for this facility includes new and innovative means of processing and utilizing a variety of solid and liquid agricultural by-products, to improve the value of the processed material. For example: processing raw or anaerobically-digested liquid manure to improve its agronomic and environmental suitability as a fertilizer, including optimizing the recovery of manure phosphorus for a commercially viable fertilizer product; processing solid manure and other by-products to improve the agronomic suitability and marketability of compost from a variety of sources; to measure the unique benefits of using composted manure for suppressing disease and improving quality in potatoes; and to quantify the impact of composting and compost use on environmental and human “health” concerns such as greenhouse gas emissions and pathogen persistence.

The combination of research, development and demonstration at one central location means industry will have ground level input and knowledge of new and emerging technologies and economic opportunities. Working with our industry partners to develop additional tools for handling and processing by-products will not only help farmers, it will also provide economic opportunities for companies that develop and provide these technologies and services.

Over the next three years, projected funding support for research and development at the new facility is estimated at \$1 million. In addition, the various technology and information transfer activities will attract upwards of 150–200 people during this period. The infrastructure will also expand NCLE’s current capacity for training and education by upwards of 25% through the graduate program, attracting promising students from around the world. These students are frequently partnered with industry and are highly sought by both industry and government employers for their technical and professional skills in sustainable agricultural production.

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Composting research will span the composting process, environmental impact of composting and unique benefits of using compost for crop production.