From manure to compost in three days

Instead of swatting house flies, Ivan Milin is looking for the best way to utilize their abilities

BY JEFFREY CARTER
Ontario Farmer

A Toronto inventor has taken a major step toward the commercialization of a unique approach to the treatment of manure and other organic wastes.

Ivan Milin's home-based research into the remarkable abilities of common housefly larvae is now being proven at the University of Guelph's Arkell Research Station at Guelph.

Milin is turning pure chicken manure into nutrient-rich fertilizer ready for application in just three days. Along with confirming the efficacy of the process, he's looking for ways to make it even better.

"I'm trying to see what the larvae most like to eat and in what environment they work their best. Up to now, everyone has tried to kill the flies. I'm the first one trying to raise them," Milin says.

"If you already have a technology and want to improve it, that's easy. What I'm doing is like inventing the first mousetrap."

The project is being supported with $160,000 in funding through the Ontario Ministry of Agriculture, Food and Rural Affairs. He's working with Dr. Youbin Zheng of the university's Department of Environmental Biology, Dr. Mike Dixon, director of the Controlled Environment Systems Research Facility and others.

Milin used a batch approach for his at-home experimentation work and a similar technique is being employed at Guelph. This mimics the automated belt system he plans to develop in order to commercialize the process.

Raw chicken manure is first inoculated with fly eggs. The minute larvae soon emerge, begin to consume the manure and grow rapidly. Within two days, the droppings are transformed into stable organic fertilizer containing a broad range of nutrients. It takes another day for the material to dry.

Milin says all organic components of the system – the larvae and the manure – are recycled.

The larvae migrate from the manure once it's been entirely digested.

These can be fed either live or in dry form to poultry, fish or other animals. Alternately, the larvae can be allowed to pupate with the pupae being fed.

The pupae, Milin notes, contain a unique set organic compounds, enzymes and nutrients. "This is what chickens are looking for when they go to a pile of manure...it's the perfect food for them."

A small number of larvae are allowed to turn into flies. They, in turn, produce more eggs that are used to inoculate another batch of manure.

The dried organic fertilizer produced has the consistency of coarse ground coffee. It can be used directly as a soil amendment or pressed into pellets. Another possibility is to add water to create a nutrient-rich solution suitable for hydroponics or home use.

The technology, Milin says, can be adapted to process a variety of other manure types and organic wastes. He envisions a pilot plant being built at the Arkell station in 2010 and a commercial-sized prototype coming on line after that.

Milin has patented his "Milinator" technology. He recently had an offer to conduct his research in the United States and he's been approached by a Canadian-based, algae-to-energy company interested in using the organic manure component as an algae food source.

Algae, Milin notes, collect and store the sun's energy as they grow and can be used as a feedstock to produce a liquid fuel that can be used much like diesel.

The process also has the potential to dramatically reduce carbon dioxide emissions. Milin is president of EcoSpace Engineering Ltd. To learn more about his Milinator process, visit the website at www.ecospace-eng.com.

Ivan Milin says fly pupae collected from his manure treatment process can be used as a highly nutritious feed ingredient.