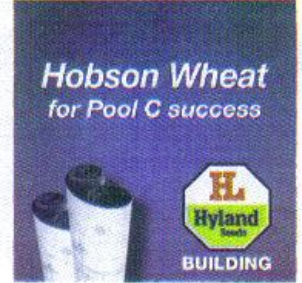
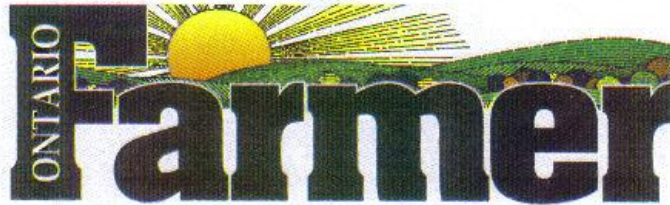




PRODUCTION SECTION



TUESDAY, MARCH 24, 2009

Inventor believes flies in a controlled plant can quickly compost manure

BY JEFFREY CARTER
Ontario Farmer

London – Farmers have long viewed the dung-loving housefly as a pest or even as a disease-carrying threat.

That's about to change.

Toronto inventor Ivan Milin has patented a system that harnesses the remarkable ability of *Musca domestica* larvae to transform manure and other organic wastes into fertilizer – in the space of just four days. There is no production of methane or ammonia, pathogens are eliminated and the natural fertilizer that's produced can replace commercial fertilizer, he says.

"This technology has the potential to eliminate a source of global pollution larger than what's produced by all the cars, trucks, ships, and planes combined . . . We have industrialized animal production but we have only addressed half the cycle. What this does is address the other half of the cycle and I've made it profitable."

Milin's inspiration originates with the space program in the former Soviet Union. Back in the 1970s, scientists there were looking for ways to deal with waste during a planned trip to Mars.

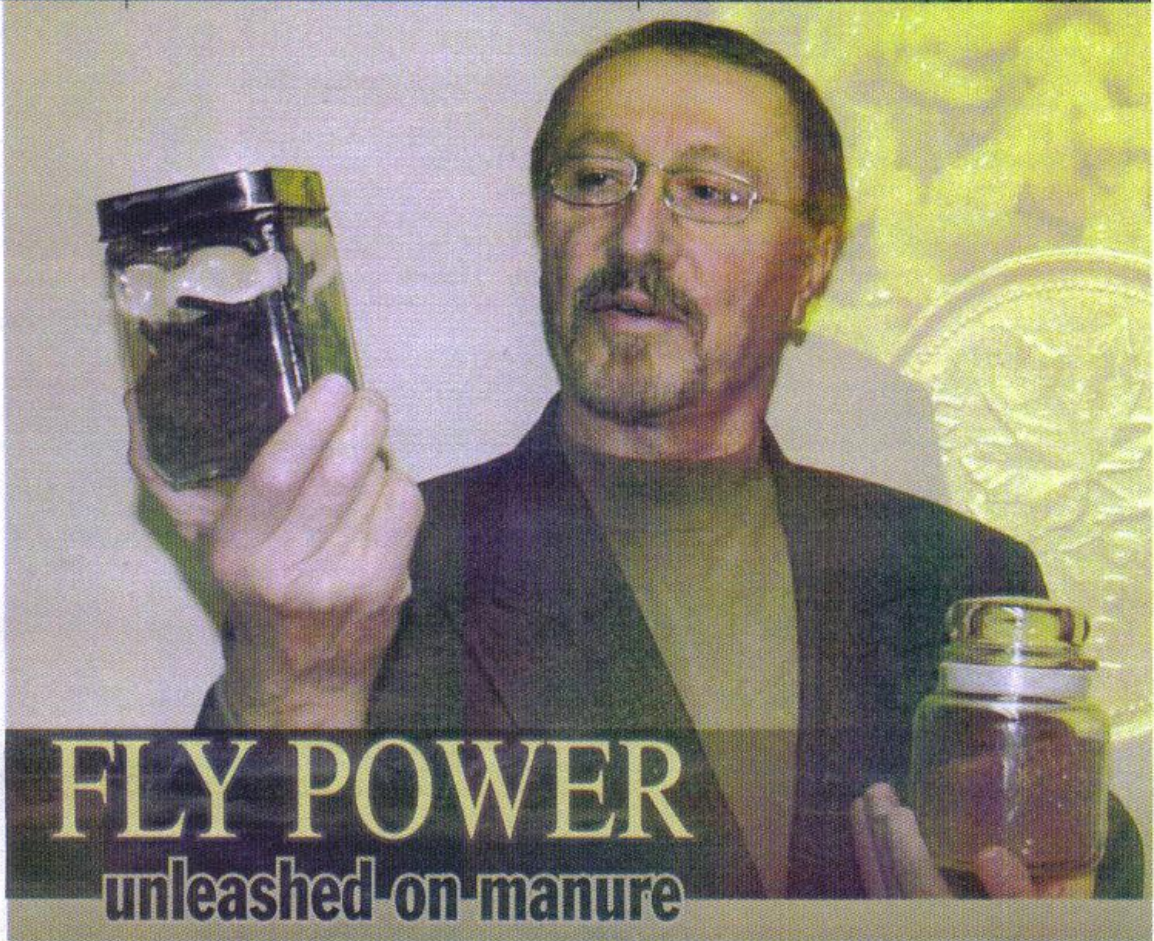
"The fastest and cleanest process they came up with was the fly larvae."

There was even a proposal to feed the larvae to poultry and harvest the eggs during the voyage.

Milin heard of the experiment during a visit to Serbia. The technology was being applied on an organic fruit and vegetable farm and Milin saw an opportunity to develop a more efficient commercial process.

"I have secured a worldwide patent for this and I have another eight months to protect that patent anywhere in the world . . . it's already patent protected in Canada."

Milin's work hasn't gone unnoticed.



FLY POWER unleashed on manure

Ivan Milin examines organic fertilizer produced from chicken litter by fly larvae. PHOTO COURTESY OF IVAN MILIN

A team of scientists at the University of Guelph will be evaluating both the system and the end product in order to optimize the process – something Milin cannot achieve alone in his home laboratory.

They'll also be looking for ways to adapt the concept to a wide variety of feed stocks and investigating the potential of other fly species. Milin has been using chicken litter from the Arkell Research Station for experimental purposes.

The effort has attracted private investment capital and there's been letters of support from the landscape and nursery industry and from agriculture.

"Beyond the apparent cost-effective-

ness of this program, it also stands to ameliorate the significant environment problems that current farming practices have with manure . . . I honestly believe that this is one of those 'Big Ideas' that only comes along once in a generation," Bob Reeves of Reeves Florist and Nursery in Woodbridge writes.

Ontario Farmer contacted Tim Nelson, executive director of the Poultry Industry Council, by telephone.

"The bottom-line is we are going to need new ways to handle manure out of poultry barns. We support anything that helps makes this cost-effective and efficient for farmers."

Milin feels sales of the fertilizer for use on urban properties and golf courses represent a huge opportunity. Farmers should also be able to produce fertilizer for on-farm use to replace purchased fertilizer inputs.

The concept requires enclosed facilities and begins with rearing the flies.

An adult female housefly will lay upwards of 500 eggs within a 30-day cycle. Milin has been feeding them a mixture of sugar and yeast to boost productivity.

Cold winter doesn't mean fewer insects

Just because it's been a long, cold winter doesn't mean insect pests won't be an issue this year.

While extreme cold can reduce survival in overwintering insects, OMAFRA's field crops entomologist Tracey Baute points out that cold isn't the only variable. Snow cover is another big factor because it can insulate the insects from the cold, allowing them to survive temperatures that would otherwise kill them.

Population models are showing low overwintering success for insects like the bean leaf beetle and flea beetles that transmit Stewart's wilt to seed and sweet corn. But Baute remains cautious, pointing out that some areas of the province received a lot of snow this year and the snow fell before it turned very cold. Those insects protected by the snow may well have survived the deep freezes of January and February.

On the other hand, southern areas saw three or four warm spells that reduced or eliminated the snow cover, leaving insects vulnerable to a subsequent freeze.

"There will be considerable regional differences," Baute predicts.

She continues to promote the need to scout early for bean leaf beetles or soybean aphids.



A soybean aphid

Experts have predicted that 2009 could be an aphid year, based on the every-other-year theory and the fact that predator numbers were low going into the winter. They will require some time to build up in response to an aphid-outbreak.

Fields with a history of early insect problems and early-planted fields should be the top candidates to receive an insecticide seed treatment this spring, she adds.

Flies

• Continued from page 1

About a cubic meter of space will house 300,000 to 400,000 flies. These will produce enough eggs – 200 to 400 grams – to inoculate a tonne of manure on a daily basis.

This is where the transformation of the manure begins.

On day one, the manure is inoculated with eggs. The larvae that soon emerge are invisible to the naked eye but by the second day, there's evidence they're working on the manure.

By day three there's a wriggling mass of larvae. By the end of fourth day the transformation is complete and the larvae, 300 times larger than when they were hatched, are ready to pupate.

"What's left basically smells like a forest floor," Milin says, noting that the larvae feed on such disease organisms as E. coli and salmonella.

Depending on the system

design, the larvae could simply be left in the digested material to boost the amount of organic nitrogen that's available. Alternatively, they could be collected and used as a high-protein feed for fish or poultry.

Milin has been using trays for experimental purposes. At a commercial level, he envisions a belt system arranged in layers so there's a continuous flow to the process.

This would also allow systems to be matched to the volume of manure being produced. Equipment housed in a 250-by-30 foot building, for instance, would have a capacity of about 20 tons a day, Milin estimates.

Another challenge has been to increase the depth of the manure that the larvae can effectively work, he says. With a greater depth, a greater volume can be handled and the system becomes more efficient.

While Milin has been using chicken litter as a feedstock, he

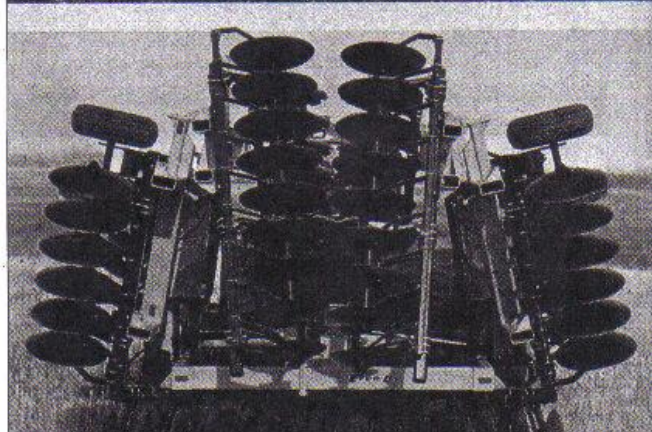
says the system can be adapted to a wide range of manure types and other organic wastes. Dead stock or vegetable wastes, for instance, would require a different species of fly.

While Milin plans to profit from his patented system, he sees broad environmental benefits and would one day like to develop micro-systems that could be used by small landholders in underdeveloped regions of the world.

On the environmental front, Milin says the system would have a positive impact by: reducing agriculture's dependence on commercial fertilizers; eliminating pathogens in organic wastes; eliminating agricultural emissions – including greenhouse gases; and retaining more crop nutrients.

Ivan Milin was educated as a chemical engineer at the University of Belgrade. Over the past 30 years, he's worked a research and development engineer in a variety of capacities.

RESULTS MATTER



Your land is no trivial pastime. It's your livelihood, your passion. Your heart and soul poured into every acre.

You can trust Ezee-On to share your passion because we've been in the tillage business for over 50 years.

We build Tandem and Offset discs that offer outstanding performance in all kinds of trash/residue/field conditions. To manage corn/bean/stubble residue or to plough down old pasture/grass, an Ezee-On disc will help you get the very best results from every acre you farm, regardless of how much residue you have to manage, how hard your ground is or how many rocks you have.

What makes us different?

- Extreme Duty Bearings with 7-year limited warranty (T2-215 Series)
- 3-year limited warranty – all tillage equipment

Let the buyer beware

Cargill agronomist Pat Lynch says he continues to be amazed by the number of, what he calls, "snake oil salesmen" traveling up and down the sideroads these days.

It happens every time margins get tight, Lynch says. As farmers try to stretch their input dollars there's usually someone offering products to make fertilizer go farther, reduce the amount of herbicide needed to control weeds, even spray nozzles that will work with any product under any conditions.

"If it sounds too good to be true, it probably is," Lynch