



Aquaponics at the Crop Diversification Center in Alberta, Canada

Canadian R&D Should Inspire Hydroponic Growers to Convert to Aquaponics

By Geoff Wilson

One of the great things about advances of knowledge from research is that a discovery in one field can have significant benefits in another. I believe that this is the case with Canadian aquaponics research that was spring-boarded by aquaponics research by Dr. James Rakocy at the University of Virgin Islands.

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The Canadian aquaponics research led by Dr. Nick Savidov (see "Aquaponics Journal, 4th quarter 2005) has shown clearly that it may pay many inorganic hydroponics growers to convert to aquaponics. They can do this reasonably easily, using existing greenhouses or shadehouses, and adding an aquaculture front end to provide organically-derived nutrients.

In Australia some 1,665 commercial hydroponics farmers could ask themselves whether or not their long-term futures lies in inorganic hydroponics or in the organic hydroponics of aquaponics. The majority of them would be operating in temperate climates where winters demand use of greenhouses for crop protection.

Their answers will vary greatly but, I predict that many Australian inorganic hydroponic growers will try aquaponics because of the financial advantage proved in Canada's research greenhouses in Alberta.

No doubt a number of the "early innovators" in Australia will be shining examples for others to follow. I will certainly write them up as they succeed. Also, I have no doubt that the good word about aquaponics over inorganic hydroponics will spread throughout the world where food and flower crops are grown in greenhouses.

Fortunately, the entrance barrier to a change-over from inorganic hydroponics to aquaponics need not be high in terms of cost or the acquisition of knowledge. The major acquisition is intensive aquaculture know-how – something which is now commonly available via academic study, short courses and serious reading.



Dr. Nick Savidov, Crop Diversification Center, Alberta, Canada

The minor (but very important) acquisition is a hobby or educational aquaponic unit that can provide an inorganic hydroponic grower with the hands-on experience so necessary before investment in an intensive aquaculture "front-end" and a re-jigging of the way food plants are grown under organic hydroponics using fish wastes.

Such a slow-but-sure approach to aquaponics by inorganic hydroponic growers will be highly desirable, in my view, to effect the most painless transition.

The aquaponics technology can work brilliantly in competent hands. I would hate to see aquaponics given a bad name from incautious experiences of "instant enthusiasts" who fail because of imperfect mastery of the business of managing three crops in unison, namely:

1. The fish crop
2. The microbial crop that

converts fish wastes to plant food 3. The plant crop.

In Canada the climate for adoption of aquaponic technology appears to be good. The Alberta aquaponics/hydroponics research project is now being strengthened considerably to delve much more into two important points.

One is the question of the “unknown growth factor” that Dr. Savidov’s team described in the aquaponics process, that gives it big advantages in earlier and faster plant crop production from cold-climate greenhouses, to capture more profitable early markets. If that growth factor can be better understood (and more widely applied) it can be expected to greatly enhance both aquaponics and inorganic hydroponics – and perhaps even soil growing of food plants.

The other important point is the economic research Dr. Savidov’s team has now started in cold-climate aquaponics using greenhouses. Bean counters with investment funds in inorganic hydroponics will be most influenced if the financial figuring clearly shows a great differential between the profits to be made from inorganic hydroponics and aquaponics.

Aquaponics might mean a stepped-up investment, but it is one that creates another revenue stream (from fish) linked with more profitable plant production. That means greater financial resiliency for a business -- and maximizing dollar returns to shareholders can be a very powerful force for rapid change.

In addition, I regard Canada as ripe for urban rooftop production of food using intensive aquaculture in basements and organic hydroponics in rooftop greenhouses. Toronto is perhaps the most likely start point for this because of its world leadership in green roof

development. Cr. Joe Pantalone, Deputy Mayor of The City of Toronto, has just sent me 170 pages of several key reports whose titles give a clue to what is about to happen in this environmentally-conscious city. They are: “*Making Green Roofs Happen*” and “*Report on the Environmental Benefits and Costs of Green Roof Technology for the City of Toronto.*” Together they give deep insights into how municipal governments in cities around the globe are likely to supersede slothful national governments when it comes to encouraging individuals and corporations to change their ways so that there can be a winnable fight against climate change brought about by human factors.

Aquaponics will, I’m sure, be part of the Toronto effort when Cr. Pantalone and Dr. Savidov get to meet and talk about the huge potential Canada now has for application of knowledge developed in rural Alberta. The ripples will spread outwards from Toronto to many cities.

I take great pride in reporting that the City of Brisbane, my home town, will be one of the early responders to the Toronto green roofs initiative. So will the tropical city of Singapore. To see why, go to www.greenroofs.com to read my guest editorial titled “Food from the Roof.”


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Then, when you have what I call “the Obligation of Knowledge” you might be motivated to start chewing the ears of your own municipal government about the new potential of aquaponics.

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Ryerson’s Green Roof Report Will Underpin Rooftop Aquaponics

The City of Toronto has consolidated its well-deserved reputation as a municipal government making excellent and speedy responses to the now well-documented likelihood of climate change. These responses do not yet include aquaponics, but I’m sure they will as the great benefits of rooftop aquaponics are further confirmed by ongoing Canadian research.

Toronto’s green roofs program, now being speeded up, is firmly based on a study report prepared by Toronto’s Ryerson University team led by Professor Dr. Doug Banting, Professor Hitesh Doshi, Dr. James Li and Dr. Paul Missios. The title of the report is “*Environmental Benefits and Costs of Green Roof Technology for the City of Toronto.*” The Ryerson team completed the report in October, 2005. A month later the City of Toronto’s policy and research staff of its City Planning Division, released “*Making Green Roofs Happen*” – a significant 50-page pointer to the future. According to Cr. Joe Pantalone, Deputy Mayor of the City of Toronto, both documents then convinced a packed meeting in Toronto

City Hall in late November to vote in favor of faster implementation of all kinds of green roofs. Subsequently, Toronto's Roundtable on the Environment adopted the meeting's green roof recommendations in a unanimous vote. They will now go to a vote by the Toronto City Council, on January 31, 2006.

"I fully expect them to be adopted as City of Toronto policy, thus setting a new standard for excellence for large world cities in this environmental area," Cr. Pantalone said. He also said a preliminary analysis of the Ryerson study showed the following "tremendous benefits" to Toronto and its citizens:

- Reduction of city temperatures from between 0.5 to 2 degrees C if only 8% of Toronto's roofs were green roofs.
- Direct energy savings in buildings from reduced cooling demand load of C\$12 million (about US\$8.7 million) a year.
- Indirect city-wide energy savings at peak load demand times of C\$80 million (US\$57.6 million) a year.
- Reduction in the levels of carbon dioxide, nitrous oxide, ozone, PM10 particulates and sulphur dioxide resulting from reduced urban heat island effects, and trapping of gases and particulates by plants grown on green roofs.
- Reduction of storm water flows by 12 million cubic meters a year – which would result in one to three fewer combined sewer overflow events a year (and consequent less risk of human health problems). A consequence would be three additional "open days" for Toronto's bathing beaches.
- Cost savings of C\$79 million (US\$56 million) a year from reduced capital costs for storm water management, erosion control and sewer overflow events.

Cr. Pantalone said: "We have produced a list of city-owned buildings which meet the necessary requirements for green roof retrofits, which can be implemented in conjunction with our regular roof replacement program. Of those, three buildings have been scheduled for conversion to green roofs in 2006, to be funded entirely within existing budgets," he said.

When I showed my home city of Brisbane's Lord Mayor, Cr. Campbell Newman and his 25 ward councilors, this electrifying testimony by Cr. Pantalone, their response was immediate. They elected a committee of two councilors with environmental interests, Cr. Helen Abrahams and Cr. Judy Magub, to find green roof demonstration projects that could be speedily implemented. The aim? To show the great economic and environmental sense of green roofs to the widest range of people in Brisbane.



An example of green roof gardens on the Schwab Rehabilitation Hospital in Chicago, where patients enjoy flowers, water, birds and fish. It is a system for improved health care that could morph into aquaponics

I know that's also going to be the response of other municipal governments throughout the world. Green roofs not only have the so-called "warm fuzzies" of saving the planet behind them; they now also have irrefutable, hard-nosed business logic.

I also believe that both the economic and environmental sense of aquaponics technology will soon begin to become an expanding and exciting feature of the global green roof movement (see my guest editorial at www.greenroofs.com).

It is a global movement that has much more chance of solving climate change problems than the politically-charged and feckless Kyoto Treaty that was initiated by the EU for the wrong reasons and has been opposed by powerful energy industry lobbyists ever since. In very sharp contrast the Ryerson study for Toronto will, I believe, be a catalyst to trigger

the fast, practical grass-roots responses that are now needed to combat global warming factors.

It augurs well for future adoption of aquaponics technology as sensible urban agriculture with very sound environmental credentials.

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