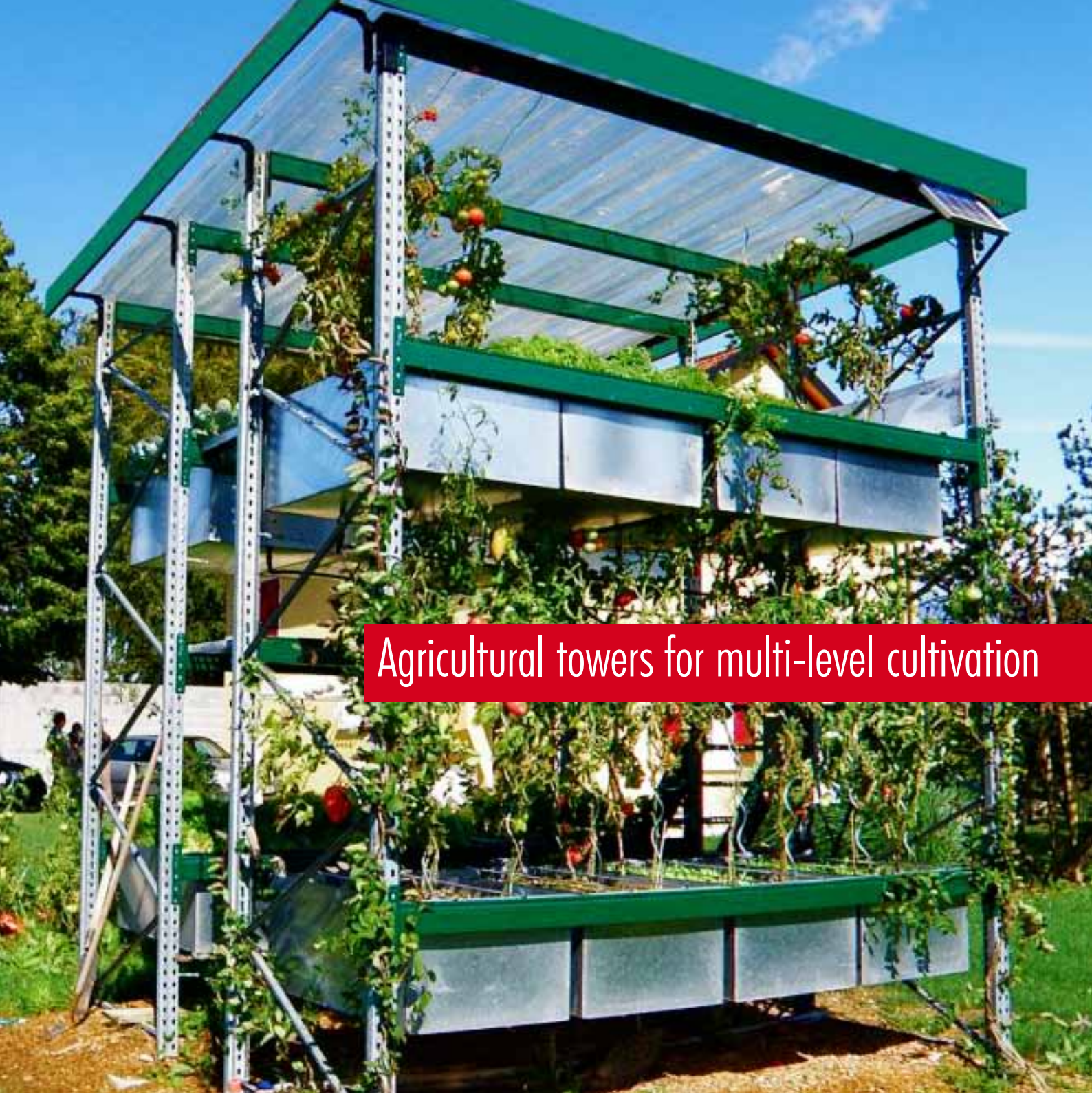


Agricultural towers for multi-level cultivation

IDEASS FRANCE

Innovation for Development and South-South Cooperation

www.ideassonline.org

Introduction

by Jean-Claude Rey

The agricultural towers for multi-level cultivation allow to increase the cultivation surface area and need a minimum of maintenance. They simplify the control and enriching of the soil for a truly organic farming. Thanks to their multilevel design, they limit plant aggressions and can be covered by nets to increase the protection against flying insects. They can be modified to fit the ground on which they are build and to optimize the control of water, using only the strict minimum. They run entirely on solar energy which is clean, renewable and free, also allowing alimentation to other structures, such as preserve farms, health centers, schools, etc.

For the first time, the garden, its operating energy and its water are all in the same place. Thanks to their self-sufficiency, these structures allow rain water storage in tanks and also, if desired, the local distribution of drinking water to surrounding populations, improving their living conditions.

With a permanent cultivating cycle, the production excess and the seasonal local production can be sold, thus creating economic and social hubs. These towers don't impose the cultivation of any particular crop or upset habits, lifestyles and customs. It's easy to protect them from intruders.

Adapted to every need (cultivating, pre-cultivating, tree nurseries, experimentation, etc.), the agricultural tower is totally independent and can even provide energy above its own needs.

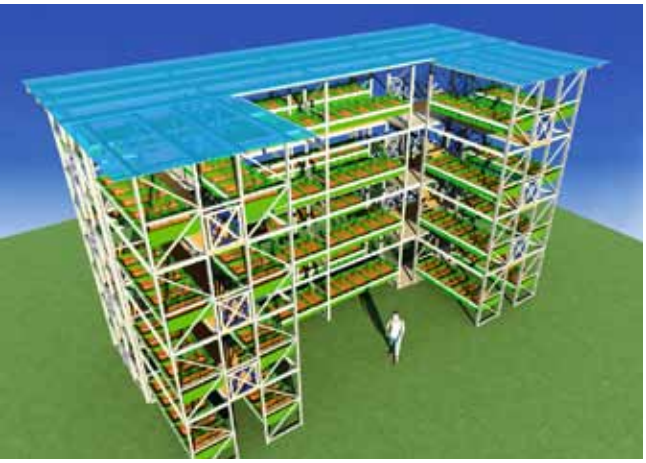
The success of this innovation was made possible with the support of the EBN network – European Innovation Centers Network – and the Business Innovation Center Thésame in Annecy (France) following the values of sustainable development.

These multilevel towers are patented and have won many international prizes. In January 2010 they got the first prize of the EBN-UNDP IDEASS competition for innovation in human development oriented towards technologies in sustainable development.

What problem does it solve?

Agricultural towers are an answer to the management and preservation of water and soil. They provide solutions for the lack of cultivable grounds and use solar energy. The loss of cultivable grounds is as much a problem for rich and industrialized countries as for poor countries around the globe. The main purpose of these towers is to allow local populations in developing countries to be self-sufficient with the production and preservation of their food, optimizing their use of water.

The main objective of this innovation is to deal with water shortage, collecting rain water and watering excess in order to water the different levels of cultivation. The roof collects rain water, protects crops from violent storms, hail or strong sunlight. The raised tubs keep rodents and other crawling animals away, the crops are untouched by accidental liquid or solid pollution and it's now possible to work in an upright position.



Agricultural towers generate social and economic hubs; they are an answer to rural exodus avoiding depopulation. They become a staging post for nomadic people assured to find water, food and energy.

These towers generate employment and improve local economies by creating short supply chains. This technology employs local labour capable of working in the towers. The local populations are trained for the setup and the maintenance of these installations.


Photo A


Photo E

Agricultural towers in practice

The devices for the watering system are fed by a solar panel fixed on the tower's roof which, due to the battery, is self-sufficient in energy. The number of solar panels can be increased to meet other needs. (Photo A)


Photo B

The roof protects the crops from bad weather and hail storms. It also permits the recovery of rain water which, through an independent circuit, runs down into a tank placed under the tower, providing a free, permanent and renewable water supply. (Photo B)

This supply can be increased by the choice of a larger tank and/or the boring of a well under the tower during its set up. The tower is then self-sufficient, its water being pumped on demand by a semi closed regulation system described in the following paragraph. The tanks are closed off from any exterior pollution. (Photo C)

Photo C

The semi-closed watering system is run by an electronic card placed in an electric box which also protects the battery and the pump. The system provides different watering modes: drop by drop, in a continuous flow or through the bottom of the tub. A computerized water control system makes it possible to meet the precise needs of every type of crop.

The programmer placed on the front of the box enables a quick access to the watering program, frequency, duration. (Photo D, E)

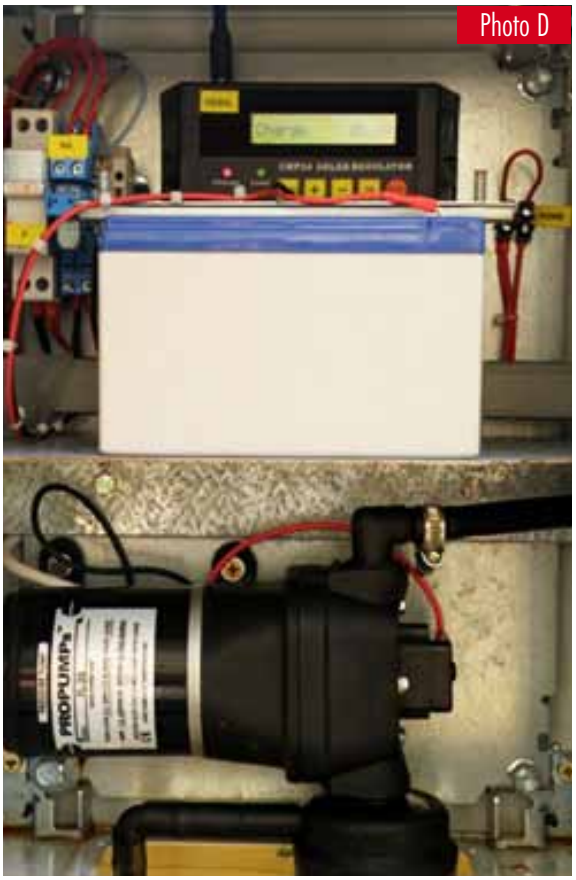


Photo D

A warning light will indicate a possible lack of water. The watering task being no longer necessary, your staff will be available for more productive work. It is also possible to add to the watering system a parallel treating system, collecting the watering excess in a separate tank with no risk of pollution of surrounding grounds with unwanted discharge. (Photo F)

Photo F

Photo G

The most innovative aspect of this system is most likely the recycling of the remaining water usually wasted after watering. Clay balls, placed in a bag on the bottom of the tub, work as a filter and maintain a constant humidity. Rain water seeps through clay and generates, by capillarity, a pool of water that is returned to the roots during the normal phase of evaporation.

This natural phase, reproduced in our concept, enables the plants to wait between two watering, avoiding a possible lack of water. You can save from 50 to 70% of water depending on atmospheric conditions and the type of crop.

Photo H

One of the many innovations is the use of self-supporting rails holding the tubs; they are adjustable in height every 5 cm enabling gardening in a standing position without the drawbacks of traditional gardening on the ground. (Photo H)

The height of the passageway is also adjustable and, together with the stairs, allows access to all floors. Light can reach the plants through the duckboards and the translucent roof. The width of the passageways can be adapted for the disabled and wheel chairs. The quality of the working conditions goes together with the quality of crop supervision. At the right level for a man, it is much easier to inspect the plants, detect diseases, parasites, etc.

Adapted to every need (cultivating, pre-cultivating, tree nurseries, experimentation), the agricultural tower is totally self-sufficient and can even provide energy above its own needs.

For large production units it's possible to equip them with elevators to make harvesting easier. They can also be converted into greenhouses for the winter using reinforced plastic sheeting fixed on the structure. Similarly, netting can also be used to protect from insects.

With these towers, the crops are untouched by accidental liquid or solid pollution, flooding or mudslides. This raised position also prevents access to rodents and numerous other crawling animals that cannot climb on the galvanized steel structures. Therefore, the number of production failures due to disease, pollution, bad weather, animals and insects is considerably reduced.

Results

Multilevel agricultural towers allow the following results:

- Optimization and management of water resources.
- Self-sufficiency with solar energy.
- Optimization of the ground surface, better working conditions.
- Back to a truly organic farming.
- Protection of the crops and profitability.
- Sustainable development and investment.
- Creation of socio-economic hubs.
- Short agricultural supply chains.

International interest

The multilevel agricultural towers have been patented and have won many international prizes:

- Geneva 2009 Invention fair, Prize from the German Inventors Federation.
- Geneva 2009 Invention fair, EBN prize for european innovation.
- Geneva 2009 Invention fair, Gold medal.
- 1st Prize Thésame for innovating companies.
- Trophy of the Rhône-Alpes Eco-innovation and of ADEME.
- 1st Prize EBN-UNDP IDEASS for innovation technologies in sustainable development.

Agricultural towers are the ideal solution for countries lacking cultivable grounds or subject to natural disasters. Climate change, the sudden rise of prices for raw materials and oil, will lead to a strong development of this type of farming.

Governments, councilors, professionals, privates, associations and NGOs are the potential users of this type of structures in order to be autonomous with the production of a part of their food supplies. This innovation enables small and big producers to create their seedling, vegetables and fruits for their own use, for schools, refugees, etc.

To learn more

Internet: www.courtirey.com

TV and Radio broadcasts

- Reportage TF1 2009 l'agriculture en étages
  http://vimeo.com/5471788
- Trophée Rhône-Alpes des éco-innovations 2009
  http://www.youtube.com/watch?v=0SpOufBqy1g&feature=player _ embedded#
- Reportage Burkina Faso 2009
  http://www.youtube.com/watch?v=bG9nrx8W1W8&feature=player _ embedded
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Press

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- Le Temps
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- Les tours font un tabac
  http://courtirey.com/docdan/6-DLLestoursFontUnTabac09.06.09.png
- Article Courtirey par Evian
  http://courtirey.com/docdan/Article-Courtirey-par-Evian.png
- Enviscope
  http://courtirey.com/docdan/11-Enviscope16.10.09.png
- Affiches Lyonnaises
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- St. Paul 31.10.09.png
  http://courtirey.com/docdan/17-DLStPaul31.10.09.png
- Un inventeur récompensé
  http://courtirey.com/docdan/2-EDSUnInventeurRecompense10.04.09.png
- Jardins Express
  http://courtirey.com/docdan/TM56JardinsExpress.pdf
- Un jardin Revolutionnaire
  http://courtirey.com/docdan/DLUnJardinRevolutionnaire.png
- Jardin Extraordinaire
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- Trophées Innovations 2009
  http://courtirey.com/docdan/10-EDSTropheInnovations16.10.09.png
- Histoire de Courtirey
  http://courtirey.com/pdf/HistoireCourtirey16.11.09PDF.pdf

Contacts

Courtirey works with the financial aid of the Rhône-Alpes region; they also receive technical advice from the EBN network and, in particular, from the BIC (Business and Innovation Center) Thésame of Annecy (France).

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The IDEASS Programme - Innovation for Development and South-South Cooperation - is part of the international cooperation Initiative ART. IDEASS grew out of the major world summits in the 1990s and the Millennium General Assembly and it gives priority to cooperation between protagonists in the South, with the support of the industrialised countries.

The aim of IDEASS is to strengthen the effectiveness of local development processes through the increased use of innovations for human development. By means of south-south cooperation projects, it acts as a catalyst for the spread of social, economic and technological innovations that favour economic and social development at the local level. The innovations promoted may be products, technologies, or social, economic or cultural practices. For more information about the IDEASS Programme, please consult the website: www.ideassonline.org.

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ART - Support for territorial and thematic networks of co-operation for human development - is an international co-operation initiative that brings together programmes and activities of several United Nations Agencies. ART promotes a new type of multilateralism in which the United Nations system works with governments to promote the active participation of local communities and social actors from the South and the North. ART shares the objectives of the Millennium Development Goals.

In the interested countries, ART promotes and supports national co-operation framework programmes for Governance and Local Development - ART GOLD. These Programs create an organized institutional context that allows the various national and international actors to contribute to a country's human development in co-ordinated and complementary ways. Participants include donor countries, United Nations agencies, regional governments, city and local governments, associations, universities, private sector organizations and non-governmental organizations.

It is in the framework of ART GOLD Programmes where IDEASS innovations are promoted and where cooperation projects are implemented for their transfer, whenever required by local actors.