

Israel's Agriculture Triumph: Implications for World Food Security By Marshall Matz

Last month, the World Food Prize symposium again focused global attention on what it will take to eliminate hunger and feed a population that is expected to reach 9 billion people by 2050. Dr. Namanga Ngongi, the President of the Alliance for a Green Revolution in Africa (AGRA), brought home the size of the challenge by simply holding up a short span of rope. He explained to the 1,400 present that in Africa many smallholder farmers are still using a rope to space rows of grain, space the seeds within a row and determine how far to place the fertilizer from the seeds.



Dr. Ngongi demonstrates how crop rows and seeds are spaced by smallholder farmers in Africa

Traveling from the symposium in Iowa to the agriculture fields of Israel demonstrated that new technologies are being developed for achieving world food security. Israel has placed a very high priority on agriculture in order to feed its population and build its economy. With over two-thirds of the country categorized as arid or semi-arid, and with significant water constraints, Israel has focused on the development of very unique agro-technologies. As explained by Dr. Arie Regev, with the Israeli Minister of Agriculture and Rural Development, "Israel has focused its research on hot climates and desert agriculture in stress conditions."

Water has been the starting point for the research and technology but it extends far beyond water to a wide range of innovation...and at every level the environment is uppermost in consideration. The Agriculture Research Organization (the Israeli version

of USDA's Agricultural Research Service) works closely with the private sector and the universities to focus on technology for producing food stress conditions.

The limited amount of fresh water is moved by an extensive National Water Carrier from the Sea of Galilee to the urban centers and farms. Ten percent of the entire country is now irrigated with high pressure, drip irrigation. Doron Lev, an engineer by training, provided a tour of his mango farm and its extensive system of hoses that water individual trees and nothing else. Further, the water is mixed with the precise nutrients needed for that crop. According to Lev, "We provide the exact amount of water and nutrients that the plant needs and not a drop more." The mixture is controlled by a computer and the computer is run on energy provided by solar panels that can be seen above the mango trees. (http://www.agrisupportonline.com/about_us.htm)



Doron Lev explains how water and fertilizer is regulated by computer based on the precise needs of the soil

In all likelihood, the water used in the drip irrigation systems has been recycled after human use. Potable water for agriculture use is being replaced by recycled water. Currently, approximately 75 percent of the water used for irrigation in Israel has been reclaimed and recycled. The country that comes in second on this score is Spain where 12 percent of the water used for irrigation has been reclaimed.

In other efforts:

- Brackish water is being used for several crops.
- Large-scale greenhouses have shifted to close-circuited irrigation and fertilizer systems. The nutrients are reused by using filtered water drainage in soilless cultivations.
- The greenhouses are totally protected environments that can control heat, humidity and insect infiltration.
- Different biological means are used for pest controls—thus maintaining the biological balance of the surroundings.
- Special insulation is used in the hen houses to protect the chicks from the external temperatures and allow them to grow efficiently.
- Dairy cows are bred to combine genetic traits of high production and resistance to heat and stress conditions in order to maintain milk production in the desert.

- Biotechnology is being used to the maximum extent possible to produce seeds and varieties or crops that grow best in arid conditions.
- Post-harvest technology is being developed to minimize spoilage and extend the shelf life of fresh products.

Traveling in the State of Israel you see a patch quilt of desert, mountains and very green fields. It is like seeing Death Valley turned into the San Joaquin Valley, and always with an eye to the environment and sustainable systems.



Deserts in the Rift Valley are turned into productive farm land by drip irrigation

The net result of this effort is a very successful agriculture industry that feeds the country, makes a \$5 billion (U.S.) contribution to the GDP and exports over \$2 billion of fresh and processed products. Much of the technology that has been developed has application beyond Israel. In the Rift Valley, there is cooperation between Israel and Jordan which has improved the agriculture economy of Jordan along with the West Bank. The greenhouses and fields you see in Israel can be seen across the Jordan River in the country of Jordan. Farm trucks in both sides of the valley have Jordanian, Palestinian and Israeli license plates. The road signs are in Hebrew, Arabic and English.



Signs along the Jordan River in Israel are in Hebrew, Arabic and English

With the trend in global warming, Israel's expertise in desert farming becomes even more valuable. While the technologies have been shared, they have not yet been maximized. Much of Israel's agro-technology has application in the Sub-Saharan and other

arid areas that are struggling every day just to survive. If the world can ever get beyond (or just around) the politics, it might really be time to turn swords into plowshares in order to advance the cause of world food security.

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