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Developing a 'Water Battery' for Trees

By JIM WITKIN

According to the World Health Organization, 1.2 billion people – or almost 1 out of 5 people in the world – are without access to safe drinking water. And even in areas with access, 70 percent of water withdrawn from fresh groundwater sources is used for agriculture.

AquaPro Pieter Hoff, left, a Dutch inventor, explained his Groasis Waterboxx to California Governor Arnold Schwarzenegger at the Green California Summit in Sacramento last month.

But using groundwater to grow crops and trees doesn't make sense to Pieter Hoff, a Dutch inventor. Not only are traditional irrigation techniques inefficient because most of the water is lost to evaporation, Mr. Hoff says, but water can be easily captured from the atmosphere to grow just about anything.

To prove his point, Mr. Hoff retired from the lily and tulip export business in 2003, established his company, AquaPro, and devoted himself to the development of the Groasis Waterboxx, which he says will grow food crops and trees even in the driest places on earth.

The Waterboxx is a round device made from polypropylene and about the size of car tire — 20 inches in diameter and 10 inches high. An opening at the center of the box provides a space for a plant or tree to germinate and grow.

The box is designed to capture both rainwater and condensation, which collects in the chamber underneath the cover, and prevents the water from evaporating. Mr. Hoff describes it as a "water battery."

A wick inside taps into the ground beneath the box and drips a small amount of water to the plant's root system each day. Once the plant or tree has taken root on its own, reaching a water source sometimes several meters below, the box can be removed and used again to start another plant or tree.

Mr. Hoff has recently concluded a three-year test of the Groasis Waterboxx in the Sahara desert in Morocco, an area that gets only a few inches of rainfall each year. Almost 90 percent of the trees planted using the Groasis Waterboxx survived after it was removed.

A test group of trees planted without the box, but watered once a week, produced the opposite result: only 10 percent survived.

This year, Mr. Hoff said he will be conducting more trials across eight countries and some 25 sites, including California wine country and Joshua Tree National Park.

Using a grant from the Dutch government, he has also developed a biopolymer version of the box that will decompose over time, releasing nutrients into the soil as it biodegrades. His long-term business model is to provide a nonexclusive, free license to anyone who wants to manufacture and distribute the Groasis Waterbox, while he plans to ask only for a small

royalty per box.

A Dutch company has already signed on.

“My ideal is that the device is available to everybody, everywhere,” said Mr. Hoff, “and my focus is to create a business model that enables the world’s poor to buy the box.”

He is talking to a Dutch bank about setting up a micro-finance scheme to enable farmers in developing countries to buy the Waterboxx.

But beyond helping to solve the water crisis, Mr. Hoff said he believed his invention could promote reforestation on a large scale to address other global problems like hunger, erosion and climate change caused by global warming.

“If we were able to plant two billion hectares with trees we could solve many of the world’s problems,” he said. “We have cut down about two billion hectares of trees in the last 2000 years. So if it’s small enough to cut it, it’s small enough to replant it again if we want.”