

Pieter Hoff: Teach plants to grow in arid places

With the world struggling to meet the food needs of its soaring population, this grower's invention helps saplings thrive in harsh conditions



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Pieter Hoff with his Groasis Waterboxx in Napa Valley, California. Photograph: John B. Carnett

Inventor Pieter Hoff retired from the lily and tulip export business in 2003 to develop a product that he thinks can help save mankind as the world's population soars: a contraption called the Groasis Waterboxx, a plant incubator that doesn't need irrigating and which could help make fertile again the 70% of the world's arid and semi-arid lands whose productivity has been hit by deforestation and overfarming. Earlier this month, the 57-year old Dutchman won *Popular Science* magazine's award for the best invention of 2010, beating 119 contenders, including Apple's iPad and the Porsche 918 Spyder hybrid supercar.

What, in the simplest terms, is the Groasis Waterboxx?

It is a bucket with a cover with two holes in it to catch rainwater and produce and catch water from condensation, and in the centre opening you can plant saplings or sow seeds.

Once it's captured, the water functions as a means of keeping the temperature low below the box and the centre opening creates a nice micro-climate. A wick drips about 50cc of water to the plant every day, which is enough for it not to die, but not enough for it to grow properly. In this way, the plant is challenged to develop its taproots to find water itself.

In other words, it allows plants to survive and grow in tricky circumstances without using any electricity or groundwater. The box can be reused for around 10 years, so you can plant 10 or so plants with it.

What inspired your idea?

I wondered how Mother Nature is able to plant trees on rocks. Take, as an example, the Sierra Nevada mountains in California, where you'll find 50-metre trees growing on rocks without any help. Whereas vines growing in the Napa Valley 25 miles to the west need irrigation to survive. How is that possible? So I started to study nature. I found that when we dig a hole to plant something, we destroy the capillary water transport system of the soil, and we plant plants with secondary roots which are not able to penetrate dry and rocky soil – whereas nature plants seeds *on top of* the soil, carried there and covered by excrement, and this keeps the capillary transport system intact.

How does your background help?

My grandfather founded my company in 1923 and I'm very experienced in growing vegetables and flowers. It's one of the most difficult professions there is – and governments underestimate it. I'll give you an example: a grower in Ecuador with 12 months of sun and fertile volcanic soil produces an average 10 tons of corn per hectare, whereas a grower in Holland with five months of sun and nothing in the way of volcanic soil produces 80 tons of corn per hectare. That is the difference between putting things in the soil and *growing*. I know how to grow.

Where have you tested the Waterboxx?

It has been tested for three years in the Sahara desert, with convincing results. Trees that were planted during the summer with the Waterboxx survived well, whereas 90% of those that were watered on a daily basis, but planted without it, died.

This year it has been tested in 30 places worldwide.

So where else might it be used?

I want to promote the use of the box everywhere that's dry and eroded and plant those areas with trees, producing food. Over the course of 2,000 years, we've been cutting down trees and grazing cattle. In this way, we have destroyed an area the size of Canada.

I'm focusing on five markets: governments; investors and pension funds; the owners of large areas of land that at present aren't economically used, in places like Mexico, South America and Australia; 300 million small farmers around the world; and consumers

I am working on a network of distributors. At present you can buy a minimum of 10 in my online store for €199.99. Later on, when they are distributed through retail, the cost price per tree for professional users should be between 50 cents and €1.

Using the box will save growers a lot of money.

What other projects do you have in your sights?

I'm working further on solving the problem on planting trees on rocks. The final goal is a spider-like machine that can walk over mountainous areas and drill 12 holes at once. In this way we will reforest all the Earth's eroded areas. I am convinced that 50

years from now, the world will be reforested. I hope my box will have played a big role in that.

We've no other option because we must solve the world's food problem: how to feed your grandchildren in 2050 when the world's population has reached almost 10 billion? The only solution is to bring back the once forested and fertile land. If trees once grew there, they can grow there again.

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