Nationale Iconen

Groasis Tech has been designated as National Icon by the Dutch Government for being one of the 3 most innovative projects of The Netherlands with a high social impact and supporting economic growth

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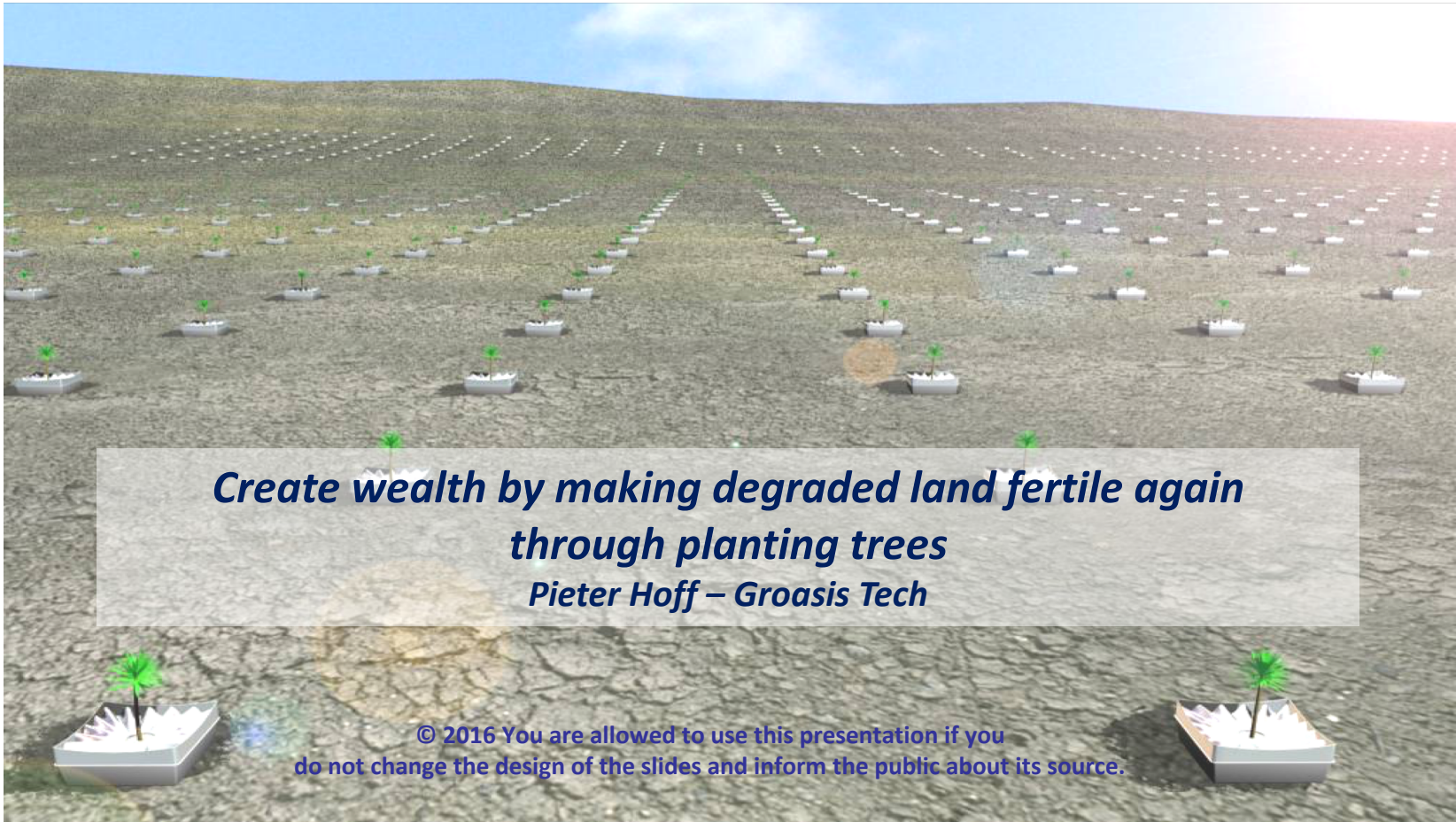
Europees Fonds voor Regionale Ontwikkeling

Groasis®

The Treesolution

with the Groasis Ecological Water Saving Technology



Create wealth by making degraded land fertile again through planting trees

Pieter Hoff – Groasis Tech

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Groasis' vision and mission: realise The Treesolution

Create wealth by disconnecting CO_2 molecules in valuable C atoms an O atoms

Download the book for free

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The Treesolution: a different look at CO_2

- Water in itself is not a problem. When there is a flood, 'over-concentration' is the problem: there is too much water in places where it should not be.
- Having CO_2 in the atmosphere is not a problem, but when CO_2 levels increase there is an 'over-concentration' problem.
- The parts that make up the CO_2 molecule are the most important atoms on our planet:
  - Carbon (C) is the basis of life and makes soils fertile;
  - Oxygen (O) is the gas that sustains all life.
- If we disconnect CO_2 in C and O atoms, the over-concentration problem is solved and we get two useful substances.
- Planting 2 billion hectares of degraded land with trees, **realizing The Treesolution**, allows us to disconnect CO_2 through photosynthesis, grow food and create wealth for everyone.

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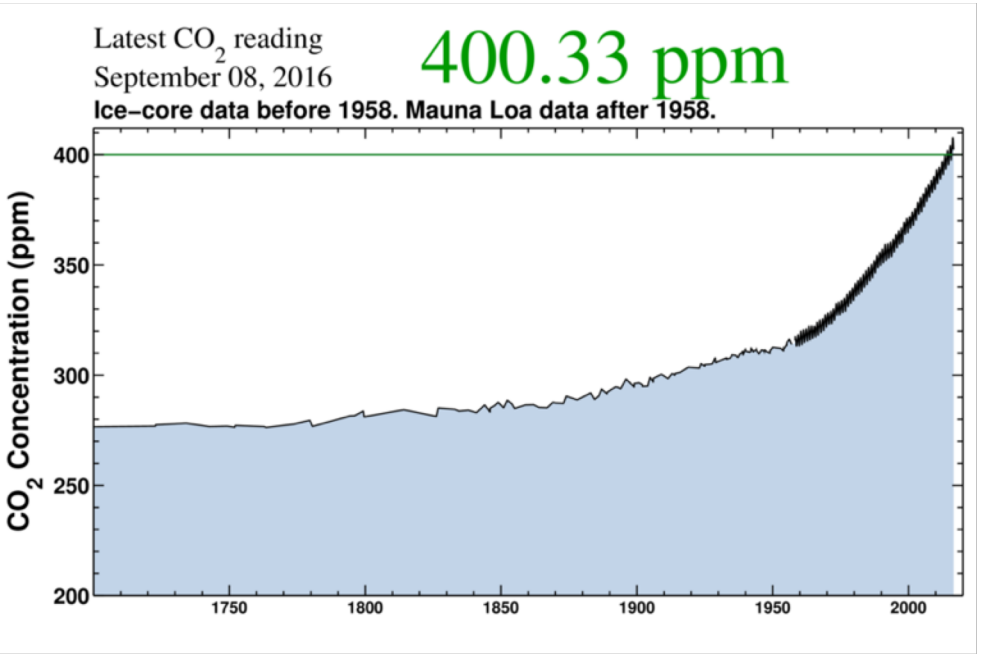
Over-concentration: water and CO_2

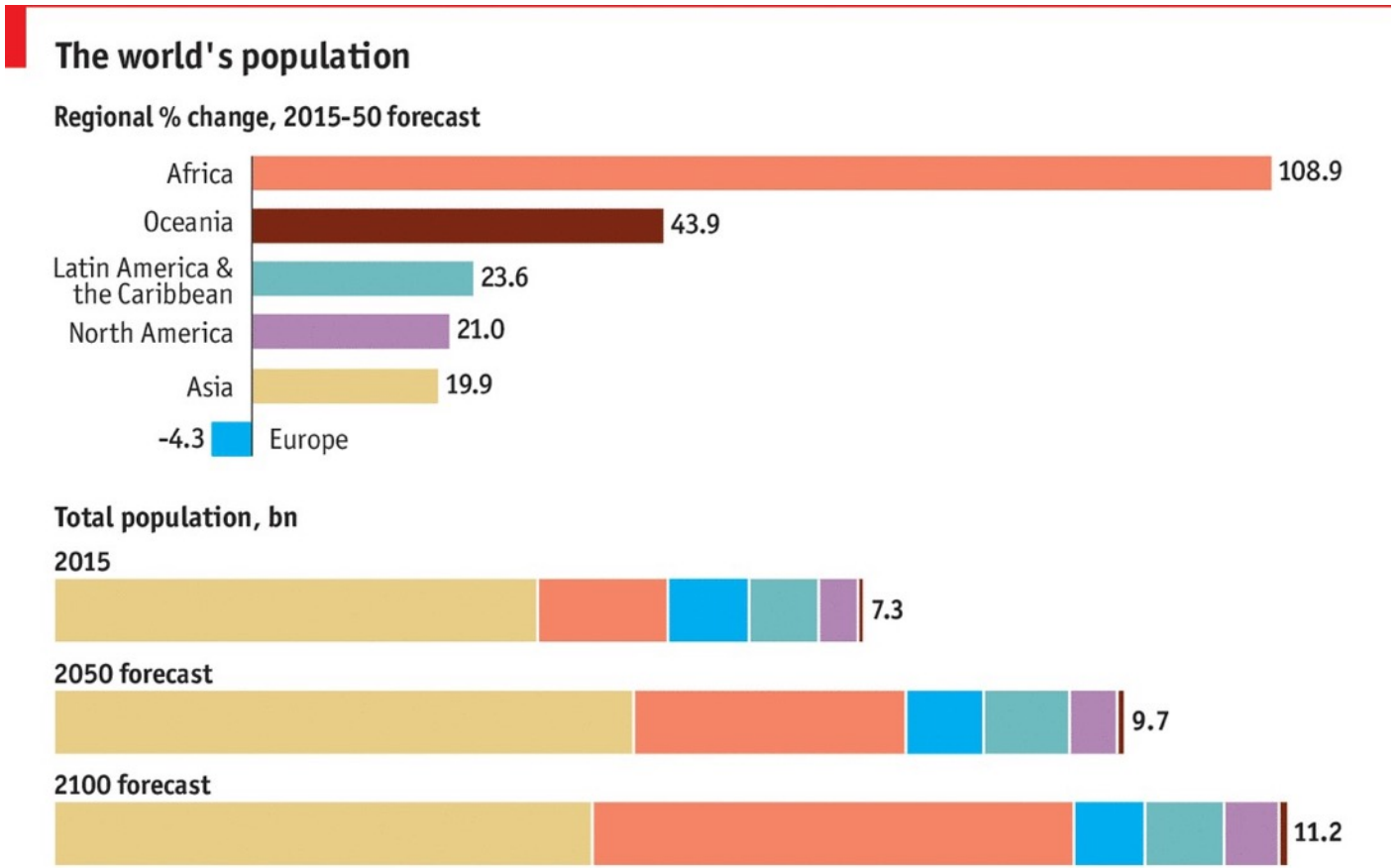


The world has 7 integrated challenges

1. Erosion
2. Poverty
3. Food shortage
4. Water scarcity
5. Climate change
6. Unemployment
7. Rural-urban migration

We can address these challenges with one integrated solution:
The Treesolution

Population growth:
Food production needs to increase by 70% within 35 years (FAO)



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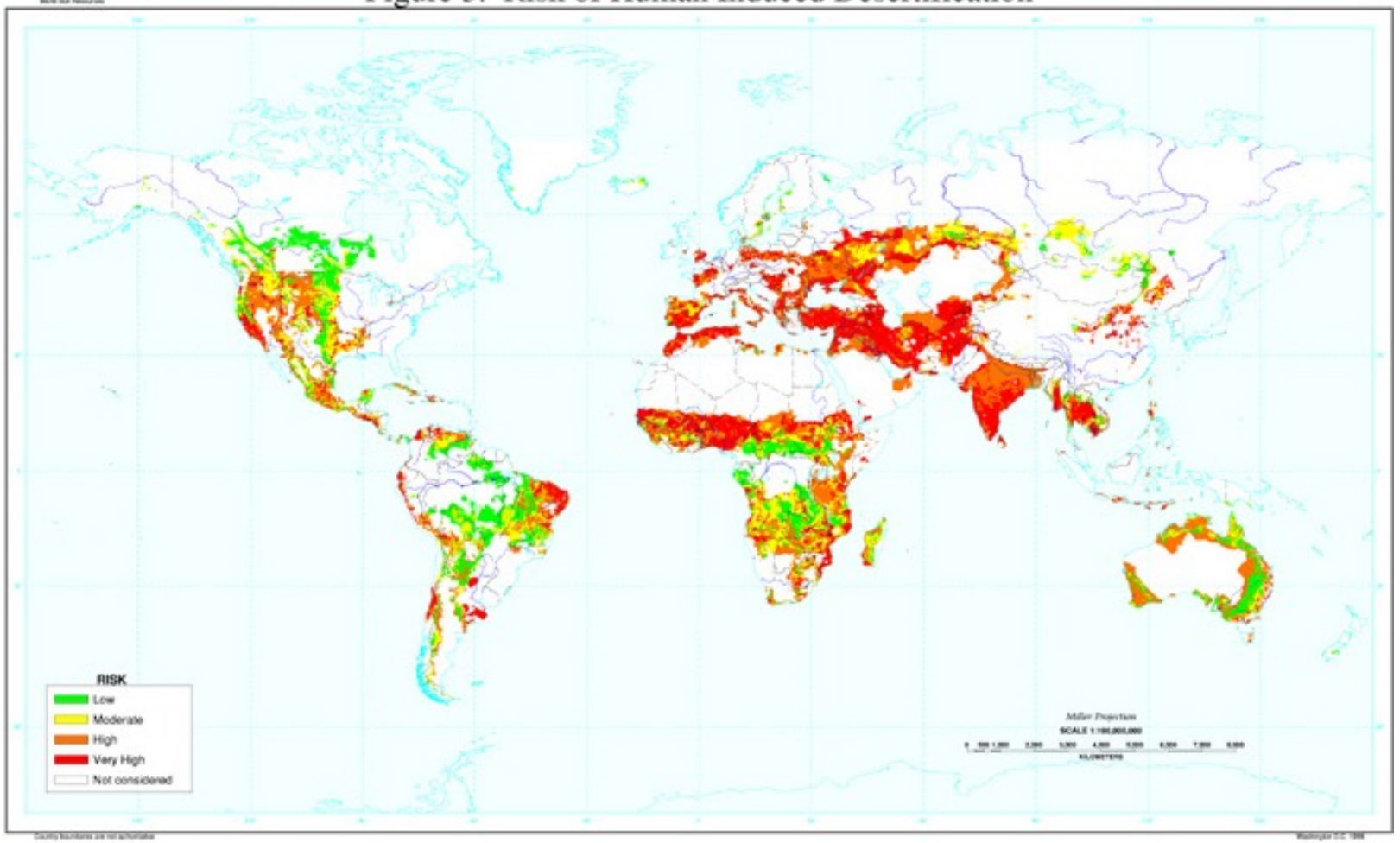
Degraded soils:
We need more food but our soil degrades (USDA)

Figure 3. Risk of Human Induced Desertification



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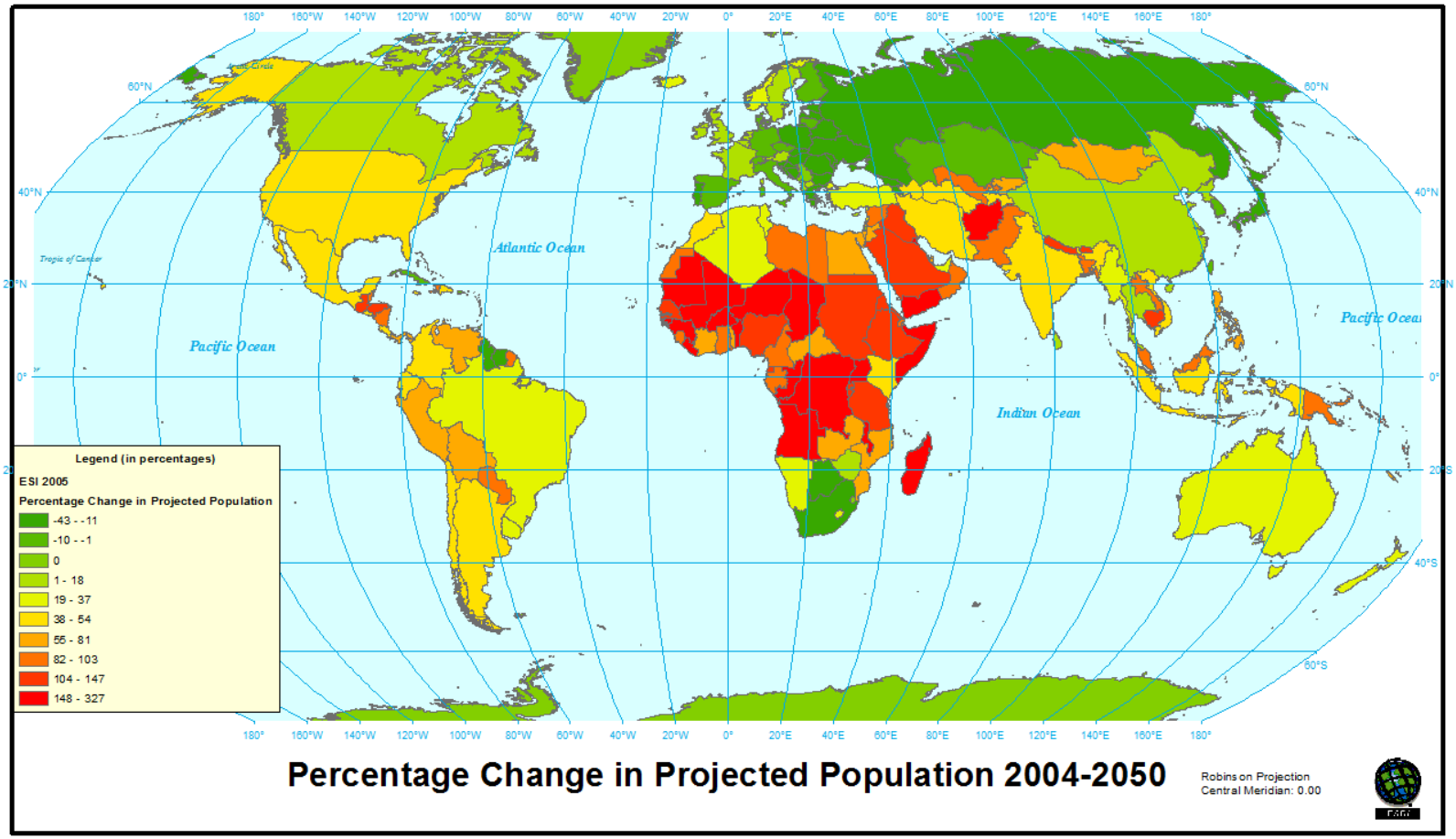
Population growth:
Mainly in areas with degraded soils (PRB)



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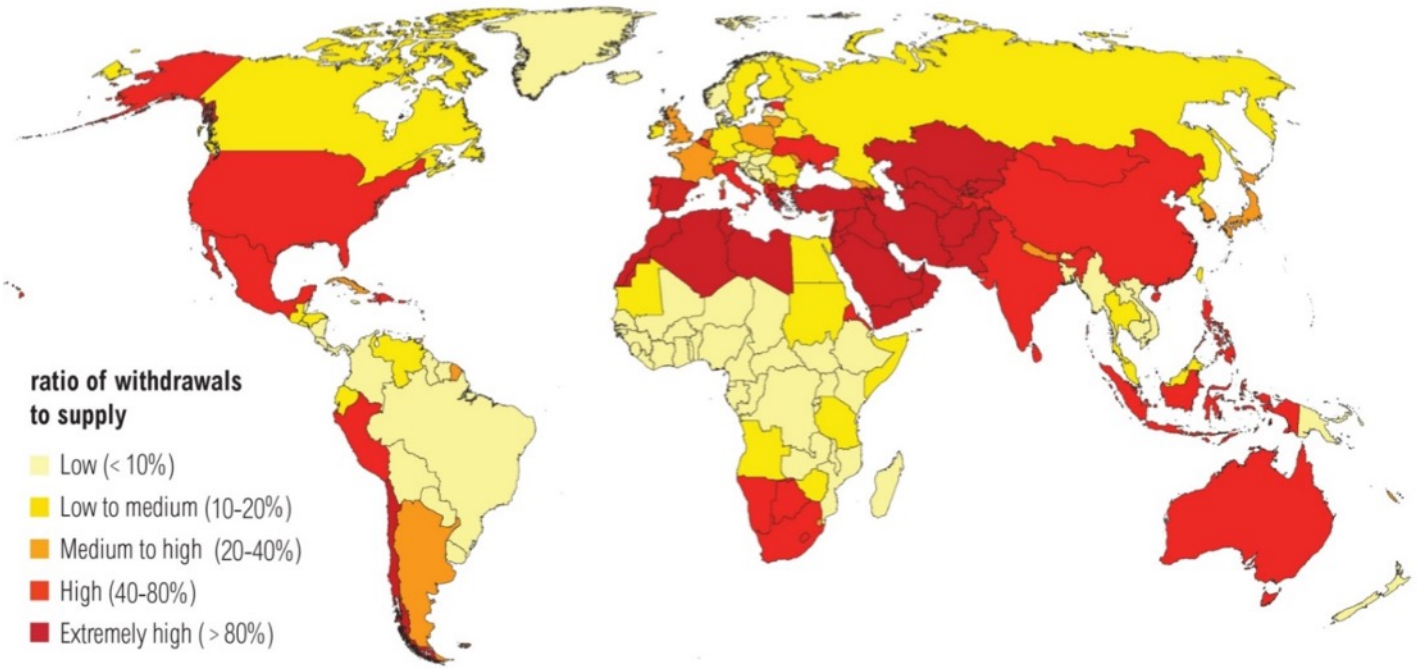
Water stress: to produce 70% more food, we need more water. The present technologies spill so much water that 48 countries will soon suffer from water scarcity

Water Stress by Country: 2040



NOTE: Projections are based on a business-as-usual scenario using SSP2 and RCP8.5.

For more: ow.ly/RiWop

WORLD RESOURCES INSTITUTE

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Plant degraded land rather than deserts to increase food production

- There are 3 billion hectares of desert in the world
- In addition to that there are 2 billion hectares of degraded land – this is where the world's opportunities are
- Degraded land used to be covered by plants and trees and was fertile, but the trees were cut and the land was overgrazed by animals
- There is sufficient rain, but it falls in peaks. For this reason seed crops cannot be grown
- Agroforestry is feasible: planting productive trees that give fruit – timber – nuts – medicines – fodder – oils – grapes – biofuel – etc.

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Degraded land:
Two billion hectares of once fertile soil available on our planet (WRI)

World Resources Institute

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Productive trees can help us solve the 7 challenges in an integrated way

- **Erosion** – trees help increase the humus content and fertility of the degraded soils
- **Poverty** – trees deliver products, these products generate an income
- **Water scarcity** – trees cause rain and help raise the water table
- **Food shortage** – trees produce annually 5+ tonnes food per ha
- **Unemployment** – trees create 0.5 direct and 0.5 indirect job per ha
- **Climate change** – trees disconnect CO_2 molecules in precious C an O atoms
- **Rural-urban migration** – people stay where they can generate an income

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What makes Groasis unique? The integrated approach.

- By using drip irrigation we are able to plant degraded land, but it requires significant investment and is very water inefficient.
  - There are 2 billion hectares that used to be productive but currently don't supply food and because of population growth the world needs 70% more food in 35 years
  - With the Groasis Ecological Water Saving Technology this land can become productive again, a micro-finance model can be implemented to do this cost-neutral for the country or profitably for the investor
- 48 Countries are confronted with water stress – inefficient agricultural technologies consume over 70% of this scarce resource.
  - The Groasis Ecological Water Saving Technology reduces water use by 90% when compared to the current technologies such as drip irrigation
- The world has over 500 million"smallholder farms" who live on very low incomes.
  - The Groasis Ecological Water Saving Technology is over 90% cheaper than the current technology of drip irrigation
  - Smallholder farmers will be able to use an innovative technology that helps increase their harvests so they have food and income for their families

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The Treesolution for the world, with the Groasis Technology

- We can replant and use 2 billion hectares of degraded farmland
- This requires an investment of USD 52.8bn
- Put the money in a microcredit fund – finance the 500 million rural families who plant productive trees
- Plant for 60 years, 724.638 hectares each week
- After 50 years we disconnect the annual CO_2 emissions of our planet
- After 60 years we also clean a part of our historical CO_2 emissions
- We create 2 billion jobs
- We produce 10 billion tonnes of food
- The cost per tonne of CO_2 offsetting: 0.01 USD/tonne
- Annual revenues of food production 4 trillion USD

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Planting degraded areas without using irrigation: the Groasis Ecological Water Saving Technology

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Groasis' integrated solution: 5 steps

1. **Increased water infiltration** into the soil
2. **Planting holes** that leave the **capillary system** intact
3. **Mycorrhizae (fungi)** that support the **root system**
4. **Intelligent bucket** for a healthy **microclimate and water**
5. **Plant protector** against grazing **animals**

The user may define

which steps to combine

'**more water in - less water out**'

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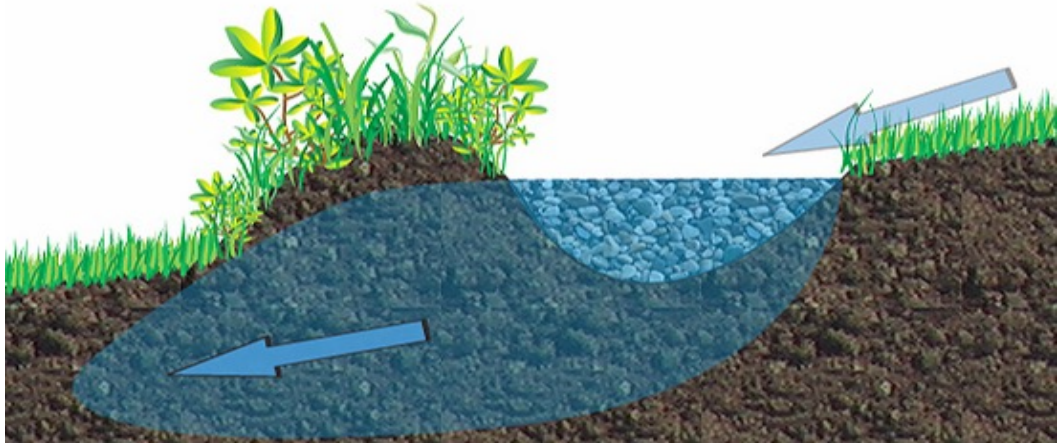
1. Infiltration: from tradional hand made to modern mini-terraces



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1. Infiltration: Groasis Terracedixx (market launch 2017)

The Groasis Terracedixx makes 15,000 meters of mini-terraces per hour.
Water infiltration in the soil increases from 25% to 90%

Watch a video of prototype testing here

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2. Capillary: Groasis Capillary Drill

The capillary system in the soil is the ‘transport system’ of water and the ‘highway’ for roots to penetrate the soil. The Groasis Capillary drill makes automated planting holes that leave the capillary system intact.

Watch a video of the Groasis Capillary drill in action

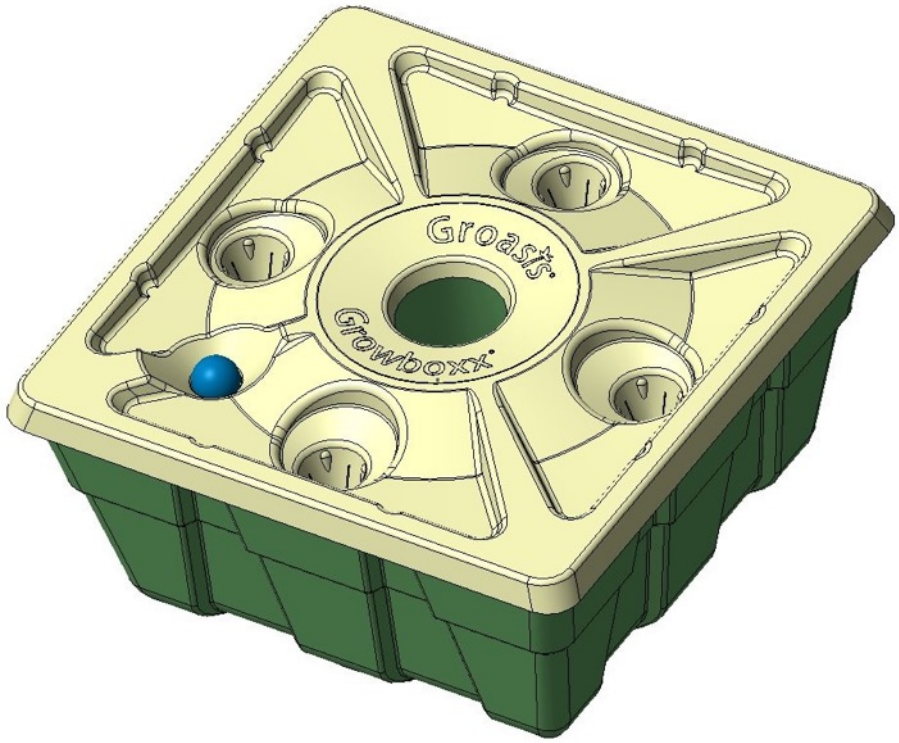
3. Fungi: mycorrhizae prevent burning of roots

Mycorrhizae are a natural alternative for fertilization. Fertilizers are salted and in dry soil they burn the roots. Mycorrhizae (fungi) replace fertilizers.

Result: left without, right with mycorrhizae >

[Read more here]

4. Intelligent bucket: the Growboxx® plant cocoon

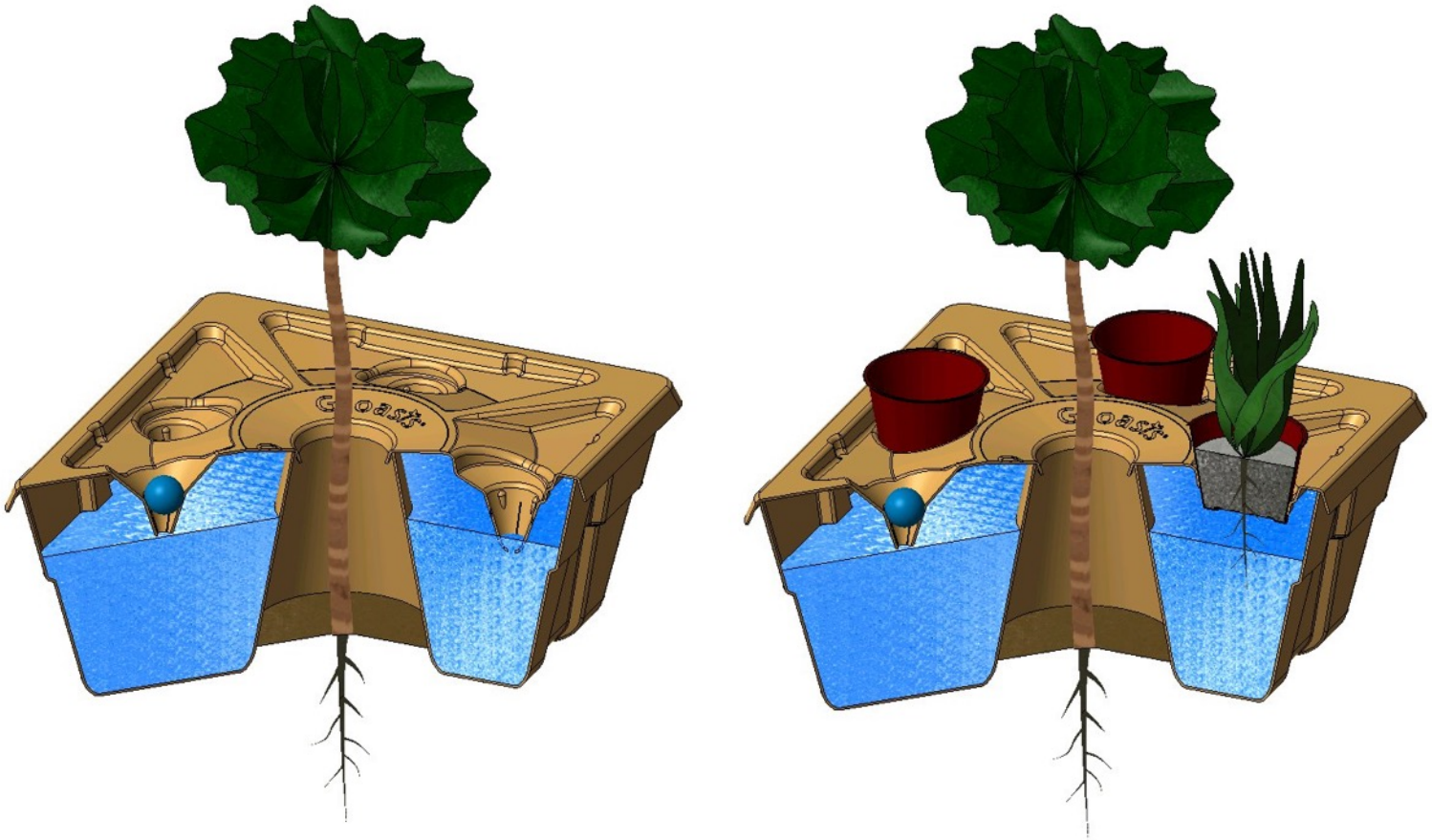


Plant trees in combination with vegetables – create food and cash revenues

90% less water use – recycled paper – inexpensive

Watch a video of the Groasis Growboxx® in action

4. Intelligent bucket: the Growboxx® plant cocoon is multi purpose



You can plant a tree only - or combined with vegetables, or plants, or bushes

4. The Growboxx® plant cocoon multi purpose use

Beautification tree with bedding plants

fruit tree with pepper vegetables

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Income model is a combination of planting trees and vegetables: this creates the possibility to use micro-credit as a financing model

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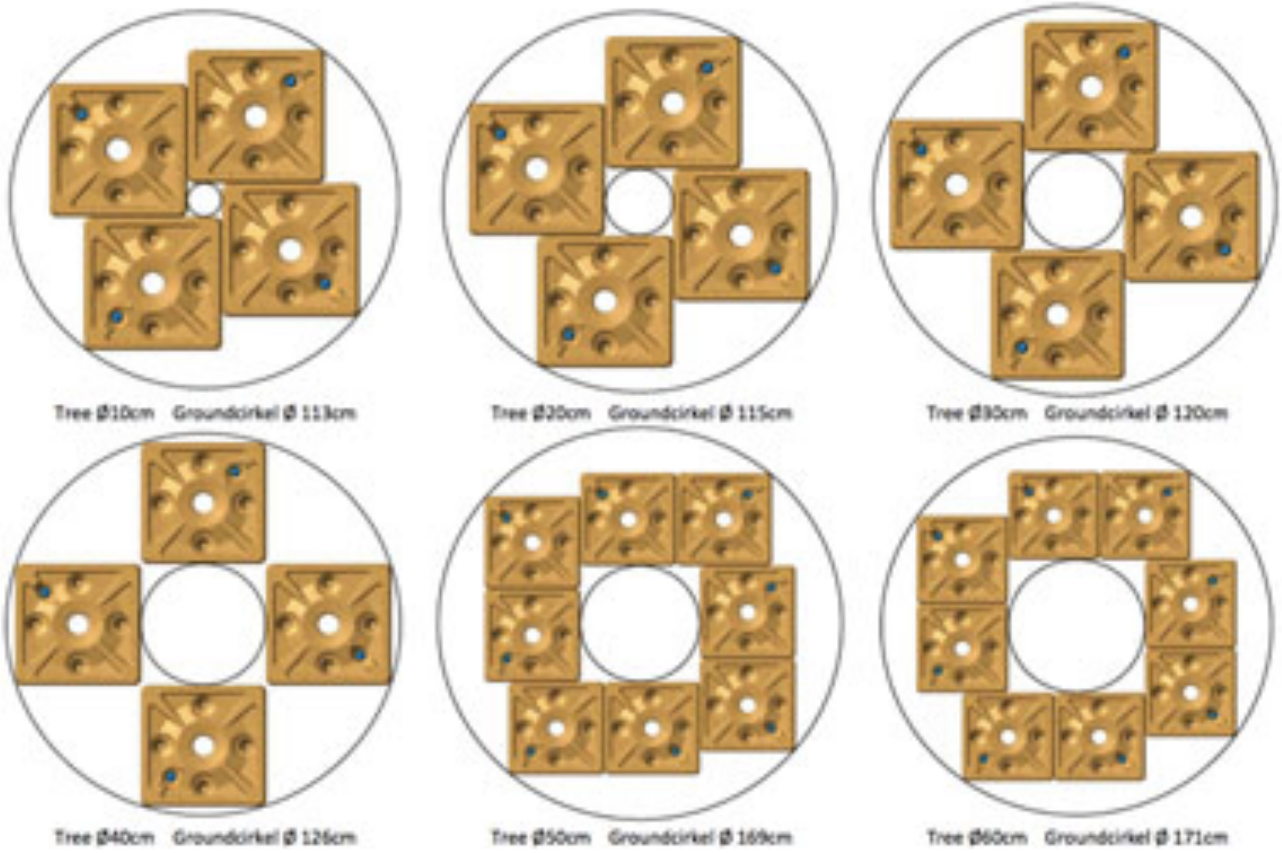
You can also plant mature, old or big trees: put the Growboxxes® around the tree and plant the big tree in the middle of them



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One of the biggest problems in many countries: overgrazing

Common landownership

Conflict of interest between tree planter and cattle owner

5. Growsafe plant protector - flexibility in height and diameter

Growsafe Telescoprotexx

Transported as a sheet – folds into a tube – grows with the tree like a telescope

Provides cheap protection against goats – sheep – deer – rabbits – hares - etc.

Read datasheet online

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Trees grow everywhere – even on rocks

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Gmelina arborea: incredible growth in just 387 days




Planted May 1, 2012

4th picture May 22, 2013

Location: Ecuador, highest radiation on earth, 111 mm rain, +41^{o}C

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Groasis' organic production of vegetables with impressive water efficiency

Why wasn't the Treesolution possible before?

- Sinks (= offsetting of CO_2) were not accepted by the Kyoto Treaty
- Sinks are accepted by the COP21 Paris Treaty under Article 4.1 – page 21:

In order to achieve the long-term temperature goal set out in Article 2, Parties aim to reach global peaking of greenhouse gas emissions as soon as possible, recognizing that peaking will take longer for developing country Parties, and to undertake rapid reductions thereafter in accordance with best available science, so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases

- Fertile soil is too expensive to use to realize CO_2 sinks through agroforestry
- Degraded land could previously not be planted without irrigation. Irrigation is very expensive and there is not enough water large scale reforestation
- The new Groasis Ecological Water Saving Technology makes it possible to plant eroded areas with productive trees without the use of irrigation and energy, and at low costs
- The revolutionary Growboxx® plant cocoon combines planting of trees with vegetables; and thus makes reforestation possible through a micro-credit model
- This micro-credit model allows rural families to plant trees and vegetables on degraded soil and thereby disconnect CO_2 emissions by creating sinks

Groasis and agroforestry

- Use one Growboxx® plant cocoon to
  - plant one productive tree
  - plant one productive tree in combination with 4 vegetables
- Planting vegetables means rural families can produce food and gain an income to help pay for the micro-credit which was obtained to purchase the Growboxx®
- Key advantages over current approaches:
  - Over 90% less water use
  - Over 90% survival rate
  - Over 10 times cheaper than irrigation
  - Year round planting – also during the summer period
  - Water collecting cover saves water
- No cultural changes necessary to adapt the Groasis Ecological Water saving Technology
- For literate and illiterate users, gender independent
- Read datasheet online

Groasis and ecosystem restoration/landscaping/beautification

- Use one Growboxx® plant cocoon to:
  - plant one native tree
  - plant one native tree in combination with 4 native wildflowers and bushes
- With only 100 Growboxxes® per hectare you can plant 100 mini-ecosystems of 5 pioneer species each – in total 500 trees, plants and bushes per ha
- Key advantages over current approaches:
  - 5 x fewer boxes – 5 x fewer planting holes – 5 x lower labour costs
  - Over 90% less water use
  - Over 90% survival rate
  - Over 90% cheaper than traditional methods
  - No irrigation necessary
  - Plannable, controllable year round planting – also during the summer period
  - Water collecting cover saves water
- Read datasheet online

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Groasis®

Groasis and gardening for beautification or home growing food

- Use one Growboxx® plant cocoon to:
  - plant one fruit tree or one garden tree
  - plant one fruit or garden tree combined with 4 vegetables or with 4 bedding plants
- The Groasis Growboxx® is usefull to:
  - Landscaping around companies or in cities
  - To avoid the use of irrigation in the garden in dry countries
  - Urban farming, city farming, home growers
  - 2nd home owners
- Key advantages over current approaches:
  - Over 90% less water use
  - Over 90% survival rate
  - Over 90% cheaper than traditional methods
  - No irrigation necessary
  - Water collecting cover saves water

Read datasheet online

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Tomato home growing in California at +41.6°C (+107°F)

Result Bill McNeese-Hemet-California
31.5 kg tomatoes in 1 season, from 1 plant
Check Bill McNeese's production figures here

Our digital communication focuses on education

- www.groasis.com – 15.000 sessions/month – 5 languages
- YouTube treeplanting channel –70.000 views/month–16 languages
- YouTube vegetables channel – 5.000 views/month – 5 languages
- Apps (iOS en Android) – planting instruction with photos in 12 languages
- Automated sales via webshop
- https://www.facebook.com/thegreenmusketeer
- https://twitter.com/groasiswaterbox
- www.thetreesolution.com Book written by Pieter Hoff

Groasis Technology is a proven technology

- Successful projects carried out in over 30 countries, in a wide variety of climatological conditions
- 45 scientific reports highlight that the Groasis Ecological Water Saving Technology works; they can be downloaded here
- Download Pieter Hoff's book 'The Treesolution' for free here
- Groasis has received many awards. Check the Award page on our website here
- If you need photos for your article or presentation, download copyright free photos here from the Groasis presskit (we'd appreciate if you add 'Courtesy of Groasis' to your article)

We are grateful to be awarded as National Icon by the Dutch National Goverment

Nationale Iconen

Groasis®

Lower cost – less water – faster growth

Thanks for your attention

Pieter Hoff
phoff@groasis.com

Our Press page contains 4 Press kits with high resolution photos

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