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SPECIAL: GREENTECH

## Breakthrough in sustainable organic cultivation

For the last seven years, the Van der Knaap Group Research & Development team, together with its partners, has been focusing on developing a cultivation system that enables organic growth independent from the subsoil.

### Reasons

The world's population is increasing and prosperity is growing. There is a growing need for high-quality food and food safety is paramount. Because there is a finite supply of mineral raw materials, collection and (re)use of natural, organic raw materials are becoming increasingly important. Sustainability and corporate social responsibility (CSR) are important principles for Van der Knaap. This is why we have entered into a partnership to develop a functional system for biological cultivation that is independent of the subsoil.



Cultivation concept 'de Kas' trial

### Development

Karel de Bruijn, the R&D manager at Van der Knaap, directed the development of a reactor that converts proteins into nitrate ( $\text{NO}_3$ ) nitrogen. The resulting nutrient solution is free from organic residues, fungi and bacteria.

Proteins/amino acids are organic nitrogen compounds that cannot be absorbed by plants. By using isolated bacteria under optimal conditions, we

can convert proteins from residual flows into  $\text{NO}_3$  nitrogen that can be absorbed by the plant. This process is patented.

### Organic cultivation

The use of mineral nutrients and synthetic pesticides is completely unacceptable in organic cultivation. Unlike in conventional organic cultivation, Van der Knaap uses substrate cultivation as part of its concept. The use of a closed circuit prevents leaching into the soil and groundwater. Water and nutrients that are not absorbed by the plant are recirculated and recycled.

One of the challenges of organic cultivation is converting organic fertiliser into mineral absorbable nutrients. Most of the elements that plants need are available in nature in a form that can be absorbed directly by the plant, with the exception of nitrogen. This is converted into absorbable  $\text{NO}_3$  by micro habitats in the soil. This natural process is very slow, however. Due to the substrate volume in the individual slabs, micro habitats alone are not enough to make sufficient nutrients available. After several attempts to stimulate this process in the substrate itself,

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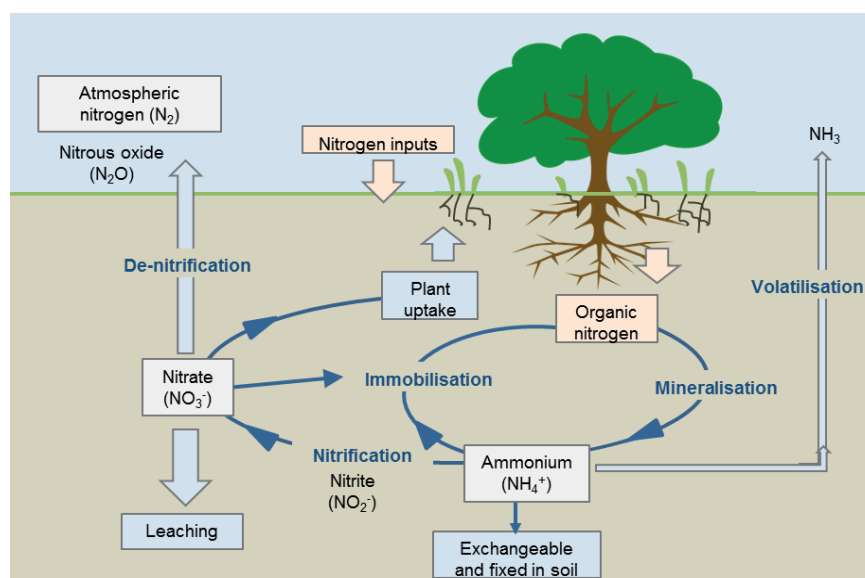
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Van der Knaap has opted for a different approach. Proteins of natural origin are converted in a separate bio reactor, following which the solution flows to the plant.

This cultivation concept has been applied in practice for three years now. In 2018, this concept will be used for cultivation at various locations in the Netherlands and Canada. Van der Knaap delivers the complete concept: substrate, fertilisers, bioreactor, and support.

### Organic or biological cultivation?

This concept allows for biological cultivation of fruiting vegetable crops as 'USDA Organic'. According to European regulations, organic cultivation of fruit crops must take place in 'living soil', as a result of which organically grown fruiting vegetables on substrate mats may not be sold as such. Van der Knaap is looking into possibilities to apply the concept in other crops as well.



Soil nitrogen cycle

## Forteco in China

**The Dutch horticultural sector is highly regarded in China and a large number of Dutch companies from the entire horticultural chain are already active there. China's middle class is growing, resulting in increasing demand for higher quality products. As a result, China is currently one of the fastest growing markets for horticulture. More and more suppliers are entering or wanting to enter the Chinese market in the near future.**

Van der Knaap has been active in China with Forteco for a number of years and sees an increasing demand for quality and sustainability. Chinese consumers are not yet familiar with greenhouse cultivation, but more stringent government regulations mean that growers will have to start growing in a healthier way.

Van der Knaap supplies, among others, the Haisheng and Hongfu companies. Both companies are at the forefront of Chinese greenhouse cultivation due to their use of high-tech facilities. Haisheng was in fact

the first Chinese company to be awarded the Tomato Inspiration Award in Berlin in February this year. Haisheng is currently growing tomatoes in a 12-ha Ultra-Clima greenhouse and is the first in China to use this greenhouse concept. Among their reasons for choosing this concept are the technology and the climate, which are improving food safety.

Hongfu recently built a greenhouse in the Daqing region. The climate in China is different from Netherlands.

It is more extreme, which makes it more difficult to keep crops going in the summer. In Daqing, however, investments have been made in modern technologies that make it possible to grow year-round.

Supplying to China can be challenging given the many protectionist measures in place. Van der Knaap will soon open an office in China, simplifying customs processes for our customers.



*Haisheng greenhouse*

## Coco peat is the substrate of the future

**Grinding coconut husks into substrates – now that is what we call sustainable!**



Coconut palms are grown all over the world in (sub) tropical climates. Coconuts are grown for their fibre, particularly in Sri Lanka and India. In Brazil and Mexico, on the other hand, the coconuts are grown for their juice and, in this case, the husk is

considered pure waste – but not for a substrate manufacturer.

Coconut is a very interesting product: it is renewable (a tree produces 100 nuts annually) and this organic material hardly decomposes. This makes it extremely suitable for substrate growing. After being used as a substrate, the product can also be reused as a soil improver.

An excellent substrate can be produced from the husks, provided that the necessary precautions are taken. First of all, the correct particle size is of particular importance. In addition, rinsing is a must, to remove tannins and salts. The rinsing water is then purified in a combination of a biofilter and a sand filter. After purification, the water can be reused

for various applications.

Coco substrate has become well established by now, and many growers are aware of its possibilities. It is a homogeneous product with excellent cultivation properties. Van der Knaap invented its own unique production process twenty years ago. It allows us to produce millions of substrate slabs with a specific composition that is high and constant in its quality.

### More information?

Would you like to receive more information about one of the topics in this newsletter? Please feel free to contact one of our cultivation consultants.

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