GROW-HOW!

van der Knaap®

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rooting/growing solutions

Van der Knaap Group introduces Forteco Optimum

Next generation coco substrate

Van der Knaap Groep introduces Forteco Optimum: coco substrate with a high air-holding capacity. Thanks to a recently developed production process that uses the entire husk to produce a high quality substrate, we can now produce a unique product at our own production sites.

New production process
Two years ago we started developing a production process that could produce a new type of coco material. This new production process optimally uses all of the coconut husk to create a special coir with unique properties.

The current standard coir is a by-product of the fibre industry and its availability depends on the demand for fibres. In other words, any changes to the demand for coconut fibre have an immediate impact on the coir supply. As we have integrated production into our in-house processes, we can now produce coir year-round. And we can respond even better to quality parameters such as the sieve fraction (size and quantity of fibres and fine particles), air content, water absorption capacity and amount of readily available water.

Unique properties
The new and improved production process makes Forteco Optimum a raw material suitable for potting soils as well as a coco substrate with a unique composition. Forteco Optimum is currently undergoing extensive trials at our innovation centre 'de Kas'. The initial findings and results are very promising.

When Forteco Optimum is used as a 100% coco substrate, its unique structure, consisting of coir and a high number of short fibres, make it a rapidly drying, airy and therefore an extremely easy to steer substrate.

Further developments
Forteco Optimum is the first substrate to be produced using a new production technique. The properties mentioned above offered by this substrate are very valuable and can be utilised for new and existing applications. We intend to investigate the options for further innovation. The focus of future developments will be on using the process for coco substrates with various structures and coarseness, and the corresponding specifications.

Forteco Optimum: new production technology

Coco: a sustainable choice
Coco substrate has good properties for cultivation: it naturally has a high-air holding capacity and absorbs water easily. Coco is also extremely suitable for developing an active soil life. This contributes to the growth of resilient plants, that are more resistant to pests and diseases.

Recent research at innovation centre 'de Kas' also showed that coco not only has a high level of biodiversity, but that an active soil life is already present which develops further during cultivation.

Coco substrate is an organic product with stable properties, which allows it to be reused for other crops and applications after recycling and processing by a specialist recycling company. This gives the material a new lease of life.

More information
More information about Forteco Optimum? Please contact us via sales@vanderknaap.info.

Rooting on Obturo® plugs

Possibilities for substrate in indoor farming

Indoor farming is a frequently heard term in horticulture. Indoor farming is a method of growing crops in a controllable, indoor environment independent from outside influences. This approach enables an optimal environment for crop growth to be created all year round. Technological developments in indoor farming are taking place at a rapid pace due to the global demand for sustainable fresh products.

Indoor farming
The concept of indoor farming was driven by the need to achieve the highest possible yield from the smallest possible production area footprint. And preferably also as close to the consumer as possible. To enable crops to be grown in a completely closed, controlled environment independent from outside influences, advanced cultivation methods are used, such as LED lighting, climate control and air treatment and other crop steering techniques (e.g. CO_2 or nutrients). Not every variety of crop is suitable for this cultivation method. The necessary investments, such as hardware and energy consumption, must be carefully calculated on a project-by-project basis. The benefit of the investment is a fully controllable crop, with year-round, plannable production.

Indoor farming is often considered as being synonymous with vertical farming, where crops are grown on multiple, vertically stacked layers. However, indoor farming is a broader concept and encompasses cultivation methods that use gutters or floating rafts in hydroponics systems for example.

Use of substrate in indoor farming
Many techniques applied in indoor farming are based on minimal use of substrate. However, a rooting medium is still needed in various technical systems to get growth started. Important requirements for this medium include water retention in the germination chamber, the drying capacity, nutrient retention, minimal contamination of the system, suitability for automation and sustainability. Our Obturo® plug offers the ideal solution.

Obturo®: the perfect plug for rooting your indoor crops!

Why choose Obturo®?
Obturo® has a unique composition. The versatility of these plugs makes them suitable for a variety of systems. The advanced production process creates a uniform, high quality plug. The plug allows excellent steerability, which is an invaluable asset when crops are grown in a system where all aspects are controlled.

Obturo®-plugs

Obturo® has a high germination rate due to the outstanding air-water ratio, whereby water retention is important in the first phase and the drying capacity is important in the second phase. The plugs contain a balanced nutrient composition for a good start to growth. In addition, they keep contamination in the system to a minimum and their dimensional stability makes them suitable for automated systems.

We think with you
At Van der Knaap Group, collaboration with our customers is paramount. From an early stage in the project, our advisors can provide valuable input about the possibilities to standardise the rooting medium and use automated processes. We closely monitor ongoing developments in the market and develop the right solutions in response, such as innovative use of renewable and circular resources.

Indoor farming

The substrate does the work!

Soil-free organic cultivation of sweet peppers

Over the past year, we have researched soil-free organic cultivation of sweet peppers. In this system, the majority of the necessary nutrients are released by the substrate. During the successful trial, a new organic cultivation concept was tested using a blend of coco material, organic nutrients and various types of compost for a rich soil life.

Growing in troughs
During this trial in the greenhouse, the sweet peppers were grown in troughs containing 20 litres of substrate per plant. The coco substrate was pre-mixed with organic fertilisers and supplemented with compost. Organic nutrients were added in the form of a top dressing during cultivation and any deficiencies were supplemented using our organic nutrition solution from the bioreactor.

In this trial design, the majority of the minerals were released by the soil life in the substrate. The great thing about this system is that the substrate does all the work and is comparable to soil-based cultivation. However, the main benefit of growing in troughs is the lower risk of soil-borne diseases, which eliminates the need for crop rotation.

Trial progress
The trial got off to a difficult start due to the dark conditions in January 2022. The release of nutrients for the plants was slightly delayed, so the EC was increased a little for two irrigation cycles. The soil life had not developed sufficiently at that moment to meet the nitrogen demand of the plants. After this single corrective measure, there were no further corrections and the (four-weekly) top dressing schedule was applied.

The sombre weather at the start was followed by wonderful spring conditions, so the trial progressed and developed very well. Insight into the availability of nutrients in the plants was gained through plant sap analyses. Soil and water samples were used to monitor the elements released for uptake by the roots. Partly thanks to the use of biological pest control, no pests infected the crops.

Conclusion
With yields of more than 25 kg/m^2, we exceeded our production target. This clearly demonstrates the suitability of this cultivation concept for growing organic crops in soil-free conditions. By controlling the availability of minerals, crop growth and development can be steered. During this trial we found a balance between vegetative growth and fruit set. The larger volume of substrate offers multiple advantages, such as a rich soil life and the possibility to delay an irrigation session during days with low irradiation levels.

The next step
This trial will be repeated in 2023, reusing the same substrate and further optimising the top dressing schedule. The amount of nutrients released via the irrigation system will also be reduced further. Our objective is to ultimately meet the full nutritional needs of the crop using the substrate.

Visit innovation centre 'de Kas'
Nothing beats seeing these developments with your own eyes! Paying a visit to our innovation centre during this follow-up trial is certainly worthwhile! For more information, or to make an appointment, please contact your account manager or rd@vanderknaap.info.

During the trial, sweet peppers were grown in troughs

Trials with circular substrates

Research into new, safe, renewable and circular resources is becoming increasingly important. For this reason, we have been running trials with circular resources for many years at our own innovation centre ‘de Kas’. In other words: materials that are reused. The ability of these materials to produce good plants has been proven by various successful greenhouse trials we performed in recent years.

Development of circular resources

The growing media, in particular potting soil, used for ornamental crops and at tree nurseries are expected to change significantly in the years ahead. The use of peat in these growing media will decrease. By using peat-free alternatives, the composition of potting soil will change, and along with it the physical properties of the growing media. When using new forms of growing media, it is important to take into account safety, pH, nutritional value and the physical properties. Substrate producers and growers must both pay close attention to these aspects. Growing crops on new growing media may mean adapting the growing strategy, for example in terms of fertilisation and irrigation.

In order to assess whether a new raw material has potential, Van der Knaap conducts growing trials and physical and chemical analyses. Once a raw material has successfully passed these trials, we set up a greenhouse trial with a crop to investigate how the substrate performs during cultivation. In recent months, we have performed trials in the greenhouse using substrates that partially consist of circular raw materials for crops including trees, bedding plants and ornamentals.

Trials in and outside the greenhouse

During 2022, a pilot was set up to study the possibilities of using circular raw materials in substrates for tree nurseries. Prunus was grown in 19 cm pots on the field outside our innovation centre ‘de Kas’. We trialled no fewer than seven different substrates with smaller fractions of peat and even a substrate that contained circular resources only.

At the same time, an extensive trial with bedding plants and flowering houseplants was also run in one of the sections in ‘de Kas’. New circular raw materials were put through their paces in this trial. We have also started to ‘stack’ different raw materials to study their effects on the crop.

Results and conclusions

The trials demonstrate that growing good quality plants is possible on substrates partially made of circular raw materials. However, a different cultivation strategy is necessary as using circular resources in potting soils alters the structure and properties of the growing media. Peat is a stable raw material with a large nutrient and pH buffering capacity, contrary to the alternatives that we have trialled so far and which have a smaller moisture buffer, for example. This logically implies modifying the irrigation strategy. But, all things considered, we can conclude that there is plenty of potential for the use of circular resources. We will be starting new trials again this year based on the data and insights obtained from previous trials.

Trial at Delphy

The trial with substrate blends with circular raw materials for tree nurseries was also performed in a slightly different way at Delphy. Various substrate suppliers provided mixtures that contained smaller proportions of peat or even completely peat-free blends. A separate irrigation schedule was applied for both types of mixtures. The purpose of this trial was to demonstrate that by applying the right knowledge of raw materials, a high quality end product can still be grown. The growth and development was measured by determining the fresh weight.

Various crops were used for the trials in ‘de Kas’