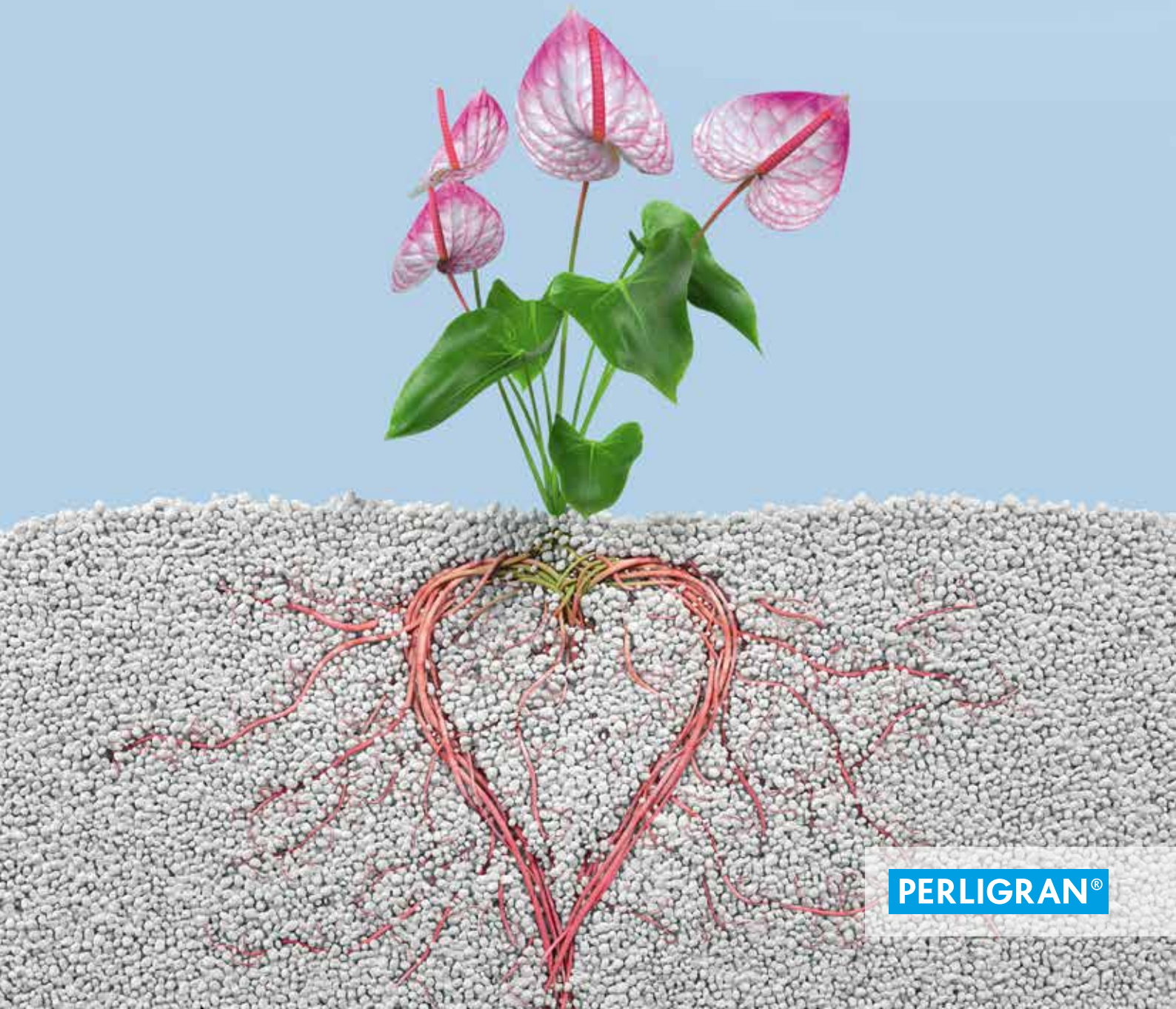


PERLIGRAN[®] – WHERE YOUR
ROOTS STRIKE SUCCESS.

Optimum growth on a mineral basis.



PERLIGRAN[®]

PURELY NATURAL + ORGANIC CONFORMABLE: PERLIGRAN®.

Optimum growth works only in optimum soil. And that is exactly the promise of PERLIGRAN®. Even more: The quality of this purely mineral soil additive rewards you with vigorous growth: the roots will thank you.

Whether as a mineral additive for substrates or in pure form: PERLIGRAN® reliably creates the best conditions for the highly profitable growth of plants.

And PERLIGRAN® helps not only your plants grow, but also your success. Because with PERLIGRAN®, incidents in horticulture crop are a thing of the past – once and for all. That creates confidence and ensures a secure future.

PERLIGRAN®: for optimum drainage, structural stability, and root aeration. For distinctly greater root growth and more vigorous, resistant plants.

PERLIGRAN®: so your plants and your business can flourish.



In the end, the result of crop depends above all on one factor: the quality of the soil. And that is exactly the promise of PERLIGRAN®.



› Raw material from which the highly specialized end products are made for different sectors and requirements, depending on the further processing.





FROM THE EARTH FOR THE EARTH: PERLITE – THE STUFF FROM VOLCANOES.

PERLIGRAN® is based on perlite, a stone that originates in volcanic lava. Thanks to our ownership participation in mining activities on the Greek island of Milos – the most well-known extraction site in Europe – we have access to extremely high quality raw perlite. A particular characteristic is its specific water of crystallization content, which gives it enormous expandability.

A special refinement process, the “popcorn principle”, is used to produce our base product from the pure mineral raw material. The crushed raw perlite undergoes thermal pretreatment followed by brief heating to over 1,000°C, causing the water enclosed in the stone to vaporize, expanding its volume up to 20 times.

Quality, stable as stone

Our PERLIGRAN® products are certified under the strict Dutch Quality Standard (RHP) and have been approved as a soil additive for organic farming and included in the list of the Research Institute for Organic Agriculture (FiBL List).

EFFICIENCY. AND OTHER OUTSTANDING FEATURES OF PERLIGRAN®.



100% natural and mineral-based

› PERLIGRAN® is based on the natural volcanic rock perlite, and, thanks to its defined water of crystallization content, can be expanded to 20 times its volume in a special refining process.

› Through screening, PERLIGRAN® is rendered nearly free of fine particles (in the Premium variant, it is absolutely dust-free). A property that ensures that your soil does not sink in when watered and always remains perfectly aerated. A decisive advantage for you, because it optimizes the mixing and volume ratio of your substrate.





**Chemically inert,
pH-neutral, light**

› In addition, PERLIGRAN® is chemically inert, nutrient-free, and pH-neutral. With a dry weight of just 90 kg per cubic meter, it is easy to transport and handle.



Safe

› PERLIGRAN® is a pure mineral medium, which means that it is phytosanitary. This virtually eliminates the possibility of unfortunate incidents in professional horticulture crop.



**Reliable and
always available
fast**

› PERLIGRAN® can be delivered reliably in constantly high quality. Since the raw material is extracted in a mining operation partially owned by us and is refined in our own production plants, fluctuations in quality are precluded. And our three production sites in Germany ensure short delivery times.



FiBL-listed

› PERLIGRAN® is organic conformable and is currently the only perlite product approved as a soil and substrate additive for organic farming and horticulture by the Research Institute for Organic Agriculture (FiBL).



RHP-certified

› RHP certification guarantees compliance with the highest standards of product safety, purity, quality assurance, and weed control, as well as research and development.



**Approval as
a soil additive**

› PERLIGRAN® can be re-used as a soil additive without any problem under the EU Fertilizer Directive.

A perfect growth substrate should offer a lot. Above all as many advantages as possible for plant and customer.



ONE PRODUCT – MANY AREAS OF APPLICATION.



100% natural PERLIGRAN® creates the best conditions for strong, healthy root growth as a basis for vigorous plants and high yields.

PERLIGRAN® used for professional horticulture

Whether cut flowers, decorative plants, or tree nursery products – PERLIGRAN® is used very successfully internationally for substrate or soil improvement, aeration, and moisture control. The PERLIGRAN® pore volume of up to 95 vol.-% ensures outstanding aeration of the substrate and creates optimum conditions for even the finest plant roots. Due to its high capillarity, it can take up moisture very quickly; at the same time, it provides for good drainage – avoiding waterlogging.

PERLIGRAN® used for nurseries

Tree nurseries also profit from the substrate-improving and soil-improving properties of PERLIGRAN®. The frequently used organic substrate components, such as peat, compost, or bark humus often become excessively soaked due to intensive rain events or excessive watering and, especially in the cold seasons of the year, often have an inadequate air void/oxygen component as well as poor drainage. In such cases, PERLIGRAN® provides optimum drainage and distinctly improved root formation thanks to a greater proportion of oxygen in the substrate.

PERLIGRAN® used for landscaping

The properties of PERLIGRAN® are also appreciated in horticulture and landscaping, for example in creating parks and public green spaces. For example, it is used for newly planted greens on golf courses to help grass roots anchor better in the ground and for high-traffic green spaces such as parks and sports fields to strengthen the soil.

PERLIGRAN® can also be used to improve difficult soils: It sustainably supports air circulation and the granular structure of soils in wet locations where air is lacking, so that plant roots can develop ideally in the loosened soil. In light, sandy soils, water capacity can be increased considerably by blending with PERLIGRAN®. This can reduce the need for frequent watering and prevent damage from drying.

PERLIGRAN® used for professional pot plants crop

For cut flower crop or horticulture crop of pot plants, PERLIGRAN® is used either as a substrate component, such as a peat substitute, or in pure form. The porous surface of the expanded perlite creates space for air and water. PERLIGRAN® optimizes water retention, and root growth improves. If pot plant substrates are used, they remain light longer. The controlled supply of water and nutrients via computerized fertilization is also possible.

PERLIGRAN® used for vegetable crop

Here, too, PERLIGRAN® is used either in pure form or in substrate mixtures. In organic farming and vegetable cropping, the associated, intensively used soil can be loosened sustainably with PERLIGRAN®. The use of PERLIGRAN® is especially suited for problematic locations, such as soils that are too moist or too sandy. When PERLIGRAN® is added to a wet soil that has inadequate aeration, it becomes lighter, more structured, and thus more permeable to air and water; a soil that is too sandy or light can retain water better if it is blended with PERLIGRAN®, which can prevent damage from drying.

PERLIGRAN® as additive for substrates

The addition of PERLIGRAN® to hobby substrates or professional substrates provides optimum aeration, improves rewettability, increases water retention volume, and improves structural stability. Substrates enriched with PERLIGRAN® therefore offer perfect conditions, especially for demanding plants whose roots reward a loose, well aerated substrate with strong, healthy growth. Thanks to screening, PERLIGRAN® is virtually free of fine particles that would otherwise cause soil compaction during irrigation. PERLIGRAN® Premium is screened twice and is absolutely dust-free.

PERLIGRAN®: a pure medium for hydroponics

Thanks to its excellent characteristics, pure, natural PERLIGRAN® in its pure form is an outstanding substrate for crop of cut flowers and vegetables in gutter systems. As a mineral medium, it is phytosanitary, pH-neutral, and chemically inert. Precious young plants and professional crop are thus protected against the influences of harmful organisms contained in the soil. At the same time, nutrients and water can be freely and precisely dosed according to individual requirements.



PERLIGRAN® can be re-used up to five times. Even after such a cycle, PERLIGRAN® can easily be recycled as a soil additive, in an environmentally friendly manner.



FOR HEALTHY GROWTH: THE PERLIGRAN® PRODUCTS.

Best conditions for every need

Roses, tomatoes, paprika – every plant has its own special requirements for the soil in which it grows. In order to meet these needs without compromise, you can get first class PERLIGRAN® quality in four variants – with the desired screening grade and grain size.

For orientation

The core application of PERLIGRAN® Classic is soil improvement for substrates and for wet, heavy soils in landscaping. PERLIGRAN® Premium is the high-end product that sets international standards, not least in hydroponics.



| PERLIGRAN® | Classic | Extra | Medium | Premium |
|-------------------------|--|-----------------------------|-----------------------------|-----------------------------|
| Grain size | 0–6 mm | 2–6 mm | 0–3 mm | 2–6 mm |
| Screening | - | 1x screening | - | 2x screening |
| pH value | Ø 7 | Ø 7 | Ø 7 | Ø 7 |
| Absolute density | 2.0–2.2 g/cm ³ | 2.0–2.2 g/cm ³ | 2.0–2.2 g/cm ³ | 2.0–2.2 g/cm ³ |
| Bulk density | 90 kg/m ³ ± 20 % | 85 kg/m ³ ± 20 % | 80 kg/m ³ ± 20 % | 90 kg/m ³ ± 20 % |
| Delivered form | Available bagged, in Big Bags, or in bulk. | | | |

Available in sizes 100 l and 150 l.



PERLIGRAN® is currently the only perlite product on the FiBL list as a soil additive for organic farming.



RAPID GROWTH: FOOD PRODUCTION WITH PERLIGRAN® SUBSTRATES.

Cropping in gutter systems is very promising: Cropping outside the actual season can produce a huge yield in a small area. The harvest time is extended from a few weeks to the whole year round. In addition, the ability to plan the harvest to an exact schedule, save water and fertilizer, and reduce soil-borne pests and diseases makes soft fruit crop in substrate cultures extremely attractive.



Profitable crop: PERLIGRAN® makes harvests possible from spring well into the fall.

PERLIGRAN® – perfect for cropping, perfect for harvesting

The use of PERLIGRAN® in plant substrates provides for safe productive crop. The addition of PERLIGRAN® ensures optimum drainage, structural stability, and aeration of the roots – even after many years of use.

In fact, soft fruit remains in the substrate for quite a long time; blueberries can last as long as 8 to 10 years. In the case of strawberries, the substrate ensures reliable, productive crop for two to three years – while minimizing susceptibility to fungal infestation or other pests. In addition, the RHP-certified material is currently the only perlite product on the FiBL list approved for organic farming as a soil additive.

Market leader trusts in PERLIGRAN®

PERLIGRAN® is used in the substrates of the world's leading suppliers of berry substrates. Dutch substrate specialists have also been developing their products for decades in collaboration with fruit and vegetable growers. Together they have found out that good drainage



But when it comes to growing soft fruits in a protected system, Germany still has a lot of room for improvement. In the Netherlands and Great Britain, for instance, nearly 100% of strawberry crop takes place in greenhouses – compared to just 10% in the German market. Cropping in gutter systems is a trend that will continue to win out worldwide.

The best way to good taste: a dry, well aerated root environment

Decisive for successful soft fruit crop are dry roots that are not too cold, the result of very good drainage. Ultimately, cold and moisture reduce growth and can also cause fungi diseases.

and good water supply are essential for a top-quality substrate. By selecting only the very best base materials, blends have been created that have proven themselves the world over.

Longer harvest, quick and easy to pick

They are cropped in gutter systems, rins, and the Dutch 'bakken', now also common in Germany. Harvests from spring to fall ensure profitable crop. This also applies to all other types of soft fruit, such as cranberries and raspberries.

Efficient, local production of foodstuffs

Today, food has to be produced as sustainably as possible on increasingly smaller areas. Due to its reliable harvest and yield, cropping in gutter systems with perlite substrates ensures sustainable food production: irrigation and fertilization can be controlled precisely, and the substrates that need to be replaced can be disposed of in an organic conformable way. This applies not only to berries, but also to many types of vegetables that find the best conditions for growth and yield in PERLIGRAN® substrates.

EXEMPLARY ADVANTAGES: THE RIGHT RATIO WITH PERLIGRAN®.



Your benefits

- › Lower material costs
- › Lower transport costs
- › Lower administrative costs

The impressive things about PERLIGRAN® are its high water retention capacity, positive effects upon root growth, and the loose, aerated soil it creates when used as an additive.



Optimum mixture for optimum results

For a visible increase in the volume of your substrate, you need an additive that retains a stable structure in the mixture. Most of the fine particles that lead to soil compaction after watering have already been screened out in PERLIGRAN®. It achieves a decisive improvement in soil quality and ensures the purest growth.

Numbers tell the story with PERLIGRAN®

For example, since the fine particles have been screened out, PERLIGRAN® Premium makes it possible to create a substrate with low mixing losses. In concrete terms, that means: Depending on grain size and screening (single or double), 85% to 95% of the additive remain in your substrate in structurally stable form.

A soil conditioner with multiple uses

PERLIGRAN® in its pure form can be re-used as a medium up to five times. There's a simple reason for that: A special steaming process destroys viruses, fungi, and bacteria. As a mineral medium, PERLIGRAN® is phytosanitary and can be re-used again after the first application, thus conserving resources.

Numbers tell the story with PERLIGRAN®

Thanks to the superior quality of PERLIGRAN®, cut flowers can grow in the same soil for 5 to 10 years.

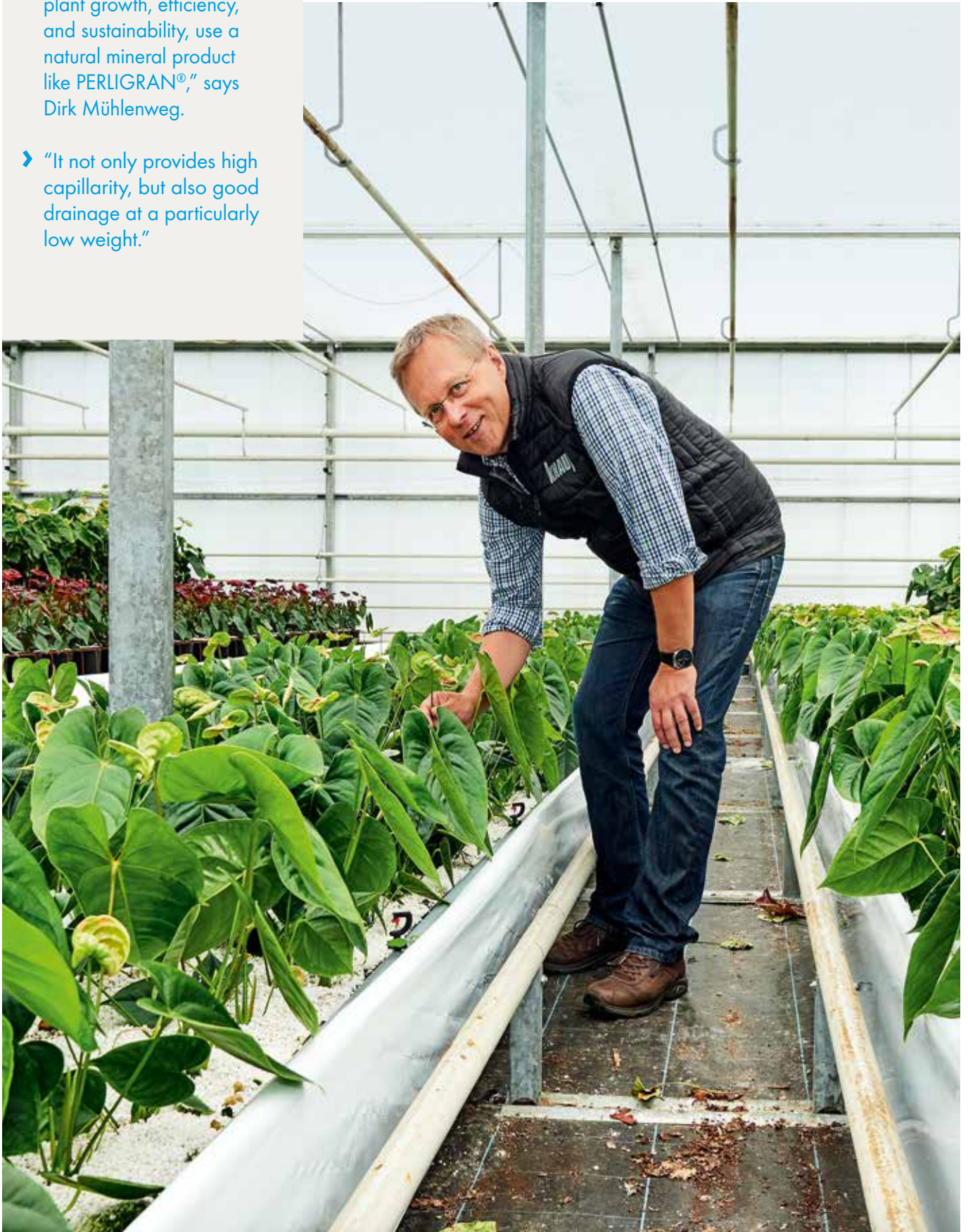
Since the costs for procurement and raising of young plants, such as anthuriums and orchids, are high in many countries of the world, first class soil is all the more important. It is often not possible to find that quality locally.

The market leader for anthuriums recommends PERLIGRAN®

- › Total costs for new construction of a growing shed: about 80 €/m²
- › Therefore, high quality PERLIGRAN® for maximum growing success
- › Costs for the soil: 2 €/m² for 6 to 8 years of use



- ▶ “To combine healthy plant growth, efficiency, and sustainability, use a natural mineral product like PERLIGRAN®,” says Dirk Mühlenweg.
- ▶ “It not only provides high capillarity, but also good drainage at a particularly low weight.”



ACKNOWLEDGED EXPERT FOR SUBSTRATES: DIRK MÜHLENWEG.

For 30 years as sales manager, Dirk Mühlenweg has been responsible for the business area of horticulture at Knauf. As a trained gardener and state certified horticultural engineer, Dirk Mühlenweg initially worked for five years as a construction supervisor and customer consultant in horticulture and landscaping before his path led him to Knauf.



There, his ideas always fall on fertile soil.

In 2003, his commitment and expertise contributed to the successful launch of PERLIGRAN® on the market. Since then, he has initiated many product innovations and internationalized PERLIGRAN® distribution

For questions regarding PERLIGRAN®, individualized consulting, or a free product sample, you can reach Dirk Mühlenweg at **perligran.com**



TAKE ADVANTAGE OF THE VALUABLE SERVICES FROM KNAUF.



NEW WEBSITE

Find information, download data sheets and brochures, or order product samples – all with just a few clicks: at our new website.

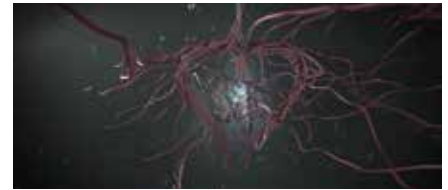
> www.perligran.com



PRODUCT SAMPLE

Convince yourself of its special structure and outstanding properties and order your free PERLIGRAN® product sample.

> You can find the order form on our website.



YOUTUBE

Special products deserve a special presentation: visit us at our Youtube channel, and view our exciting PERLIGRAN® product film.

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Ceiling systems

Knauf Bauprodukte
Professional solutions for home

Knauf Design
Surface expertise

Knauf Gips
Drywall construction systems
Soil systems
Plaster and facade systems

Knauf Insulation
Insulation systems for renovation and new construction

Knauf Integral
Gypsum fiber technology for floors, walls, and ceilings

Knauf PFT
Machine technology and systems engineering

Marbos
Mörtelsysteme für Pflasterdecken im Tiefbau

Sakret Bausysteme
Dry mortar for new construction and renovation