

LITE-SOIL

All in ONE: Air-Soil-Water

LITE-DRAINS



The latest innovation for sustainable plant growth for the professional sectors of horticulture, road construction, and landscaping as well as for green roofs and walls

PROPERTIES

LITE-**DRAINS** mixed into the soil enhance **water** and **air distribution**, thereby increasing its stability and providing it with better and persistent vegetation.

LITE-**DRAINS** are strips (LITE-**STRIPS**) and nets (LITE-**NETS**) cut from thick nonwoven geotextiles or drainage mats. They consist of environmentally friendly, high-strength and rot-proof geotextiles/nonwovens made of long-lasting polypropylene or **biologically degradable** raw material such as wood fiber or PLA. As these nonwovens contain up to approx. 90% open and interconnected voids, they can drain air and water very well on the one hand and additionally serve as a water reservoir thus fully disposable for the plants. The voids can accumulate up to **10 l/m²**, depending on the thickness of the material.

When stretching a LITE-**NET** – e.g. tripling its size – the storage volume spreads accordingly. LITE-**DRAINS** are ideally adapted to the soil structure and can be installed

3-dimensionally in any desired level, e.g. at root depth in order to fully meet the plants requirements. The open strip or net structure allows the roots to penetrate the mixture with soil, thus LITE-**DRAINS** can be installed at any required depth.

Due to their net- or strip-shaped profile, they do not form any barrier for roots or worms. As the roots can dock from each side, the entire water stored in the LITE-**DRAINS** is disposable for the plants.

Unlike other conventional products LITE-**DRAINS** are **both air and water storing products** and result in **better 3-dimensional distribution** of water and air in the soil layer. They have a **water balance effect**: with dry ground they are **water storing** and with wet ground **water draining**. LITE-**DRAINS** store significantly more water than comparable competing products (e.g. LECA). This has been clearly proved by tests carried out by the University of Natural Resources and Life Sciences Vienna (BOKU).

As LITE-**DRAINS** lead the **water quickly** into the soil and **extensively distribute** it, less water evaporates on the surface.

ADVANTAGES

New application possibilities and immense advantages arise from their new, patented design (strips or nets) placed in the soil:



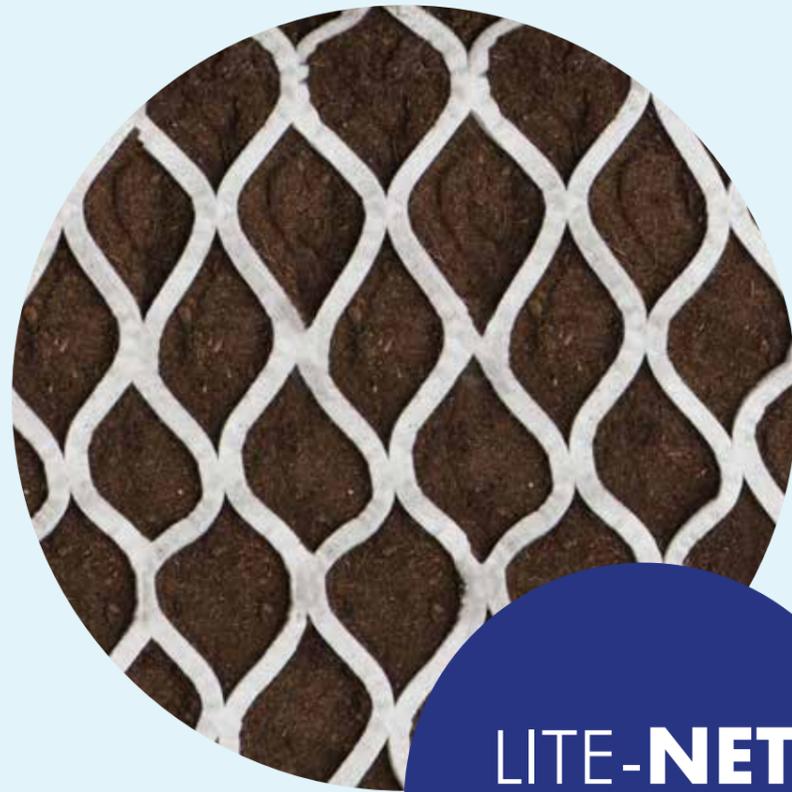
LITE-**NET** 3-dimensional

- Excellent water storage capacity
- High water transmissivity/drainage capacity
- Optimal soil aeration
- Sustainable greening effect
- Cost-effective
- Simple installation
- Installation at any required depth possible
- Three dimensional installation possible
- High flexibility
- Light weight
- Erosion protection
- Particularly most suitable for challenging terrain such as erosion, drought, deserts, silting and slopes

OUR PRODUCTS



LITE-
STRIPS
p. 6



LITE-**NET**
p. 8



BLUE
LITE-**NET**
p. 10

LITE-STRIPS

The usually 7 and 12 cm long LITE-**DRAIN** strips mainly act as **water storage system**

for multiple applications.

For this purpose, the thick nonwoven strips are mixed into the soil (depending on the application from 2 to 20% of the soil volume). Up to 90% of the strips' volume can be filled with water, thus helping the plants throughout longer droughts.

APPLICATIONS

Lawns

Athletic fields

Lawn turf

Green roofs

City trees

Moving large trees

**Raised planting beds/
boxes/plant pots**

Slopes - Hydroseeding

Aerification



For **roof greening**, the lightness of the strips results in a **massive weight advantage** compared to conventional materials (e.g. clay spheres).

In order to **aerate** lawns or after pressure ventilations, the strips can be vertically introduced from above into the soil. **Water** and **air** absorbed on the surface is transported through the strips' voids **into the ground**. This prevents felting and roots can be led deeper into the soil. This new form of aeration offers a **durable and sustainable solution**.

For **lawn turfs**, LITE-**STRIPS BIO** can be incorporated into the top 5 cm of the soil in order to **enhance the growth of the lawn while better taking root**.

LITE-**STRIPS BIO**



LITE-NET

The nonwoven **LITE-DRAIN** nets show excellent **aeration** and **irrigation** properties. The nets can be stretched to increase their size up to 4-5 times and easily covered with soil; in some places they may be even lifted up to the surface. There the **LITE-NETS** absorb air and water in order to spread it most quickly and extensively at **root level.**

APPLICATIONS

Lawns

Athletic fields

Lawn turf

Green roofs

City trees

Moving large trees

Planting beds

Slopes

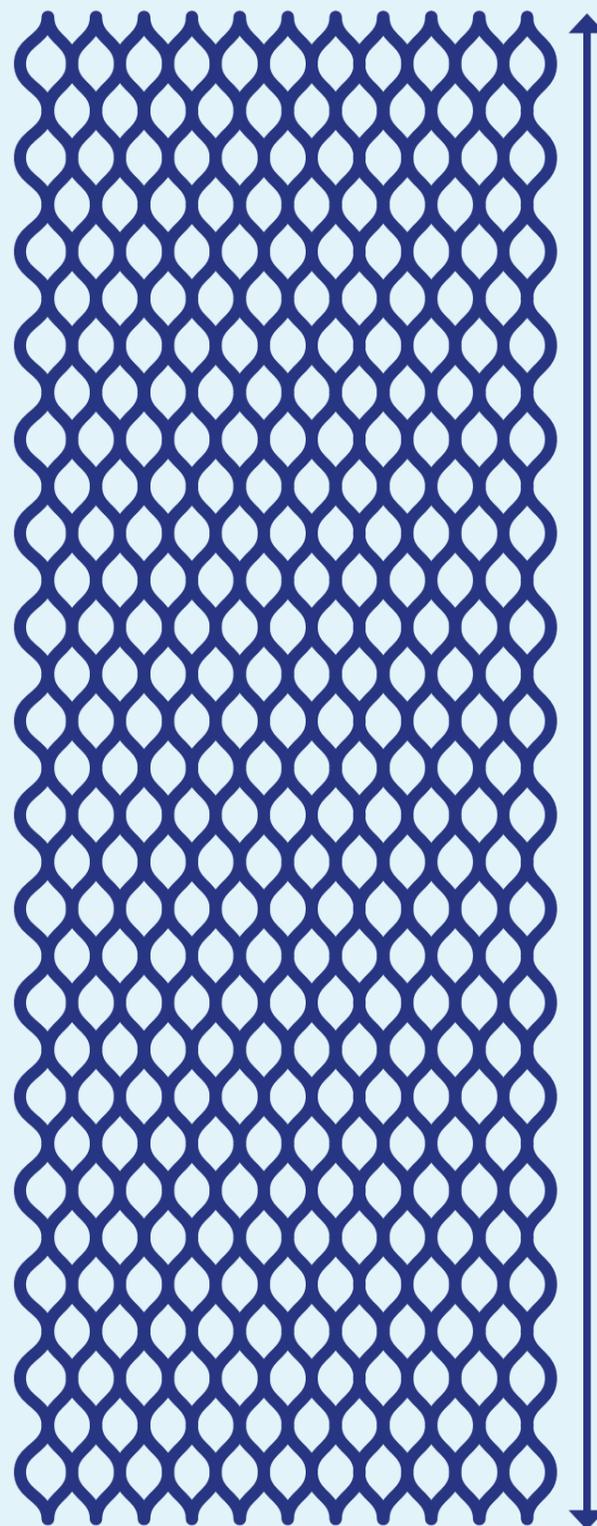
Drainage for filter basins

**LITE-NET
520 C20/6,
unrolled
and not
stretched:**

24 m²

20 m

1,2 m



16 m

5,2 m

**LITE-NET
520 C20/6,
unrolled
and
stretched:**

83,2 m²

**The LITE-NET
can be stretched
up to 4 to 5 times
its size.**

BLUE LITE-NET

Poor and irregular distribution of water with changing soil properties and the danger of blockage are the disadvantages of conventional underground irrigation hoses. Standard extensive drainage mats suffer the disadvantage of impeding the deep growth of roots, so young roots are not sufficiently supplied with water, this means that additional and expensive irrigation from the surface is required in the initial phase.

These problems were solved with the active BLUELITE-NET irrigation system for cost-efficient and water saving underground irrigation.

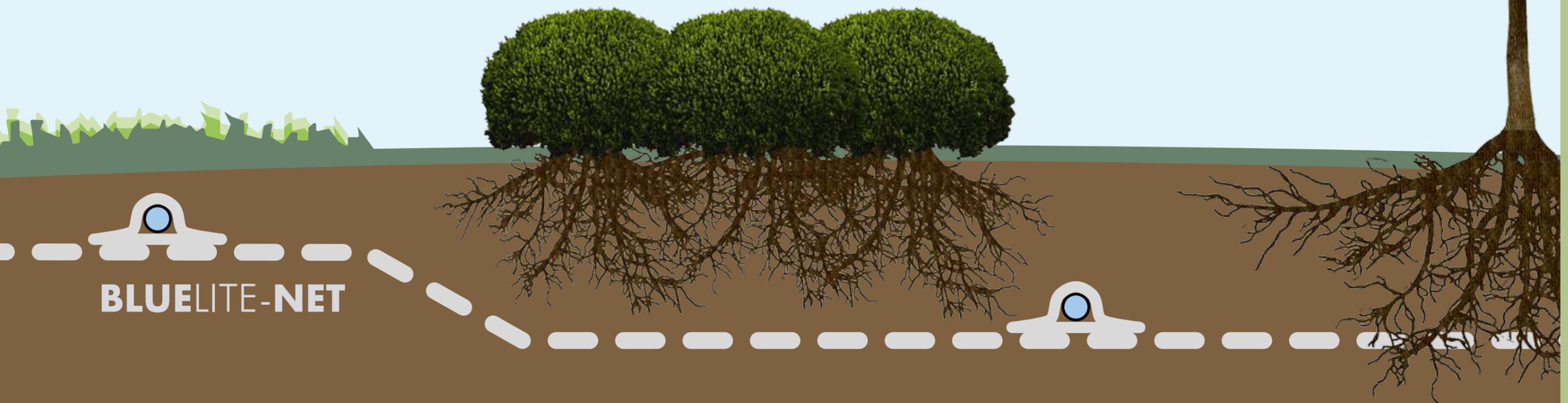


APPLICATIONS

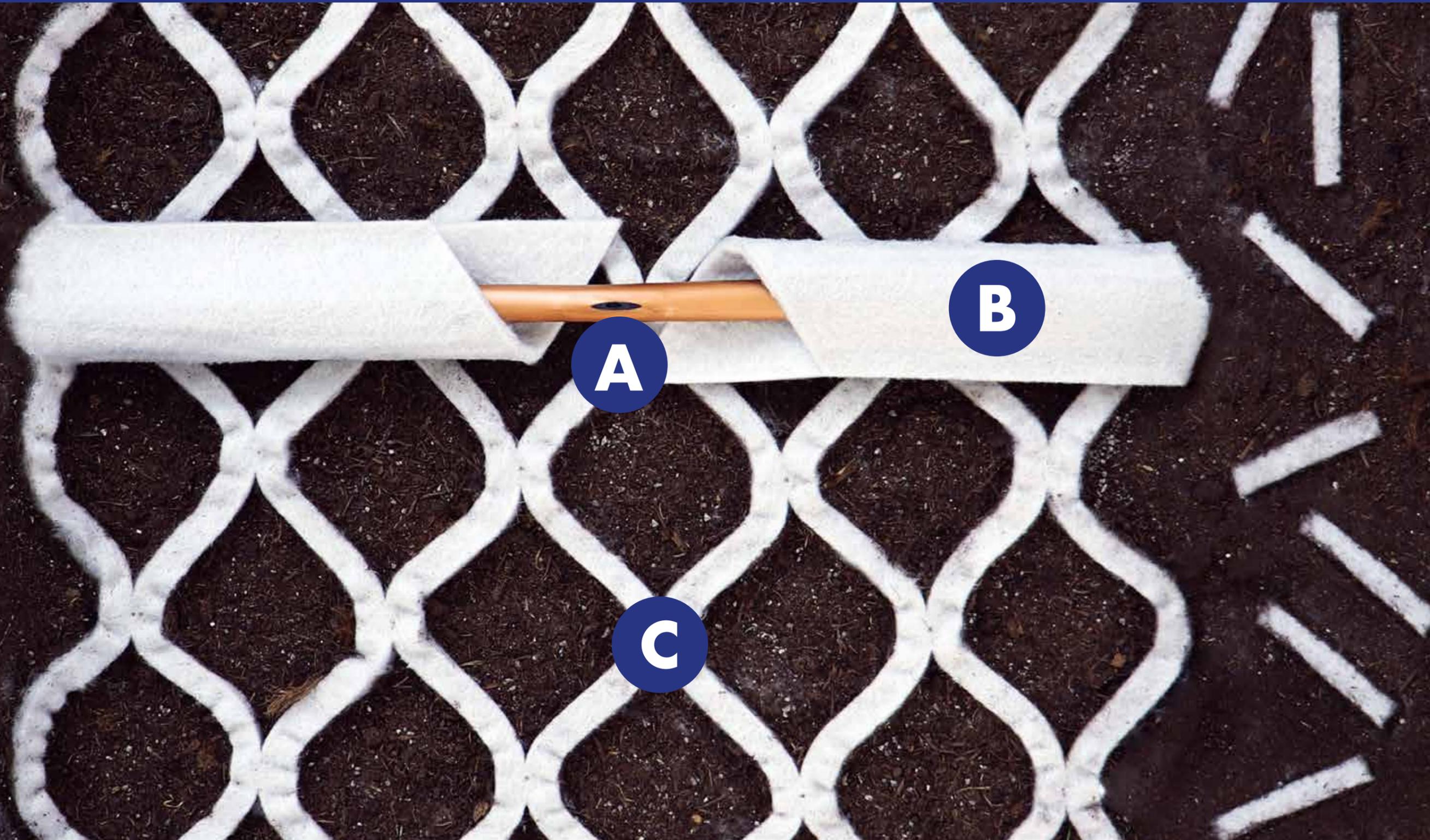
Lawns
Athletic fields
Lawn turf
Green roofs
City trees
Moving large trees
Slopes

ADVANTAGES:

- **water distribution** without evaporation
- **thousandfold increase** of air/soil contact
- **simple installation** at any desired depth
- **cost efficient** and **durable**
- **water storage with root penetrability**
- **water savings** of up to 70%
- **protection** of the **irrigation pipe**



It consists of an **IRRIGATION PIPE A**, which transports the water through a **NONWOVEN COVERING B** via capillary action into the **LITE-NET C**, where it is **extensively and evenly** distributed at root level.



The nonwoven covering **protects** the **irrigation pipe's** orifices against ingrowing roots and obstruction by soil particles. Additionally, the covering increases the **water/soil contact area by a thousandfold**.

Thanks to the underground irrigation, evaporation, felting or superficial water-logging are non-existent. The **irrigation is always and consistently** possible, even while the lawn is being used. Due to its **open and flexible** net structure, no barrier is created and plant roots can grow through the net or even attach themselves to it without any further difficulty. **100% of the water** accumulated inside the nonwoven net (up to 10 l/m²) is thus **disposable for plants**.

BLUELITE-NET can be installed at any desired depth – optimally adapted to the respective plant – and placed in many layers and shapes. Even during their **initial growth phase** or in case of a **plant mix** (plants with different root levels can now be grown simultaneously – large trees, flowers of any size, lawns, etc.), the roots will dispose of an excellent water and air supply.

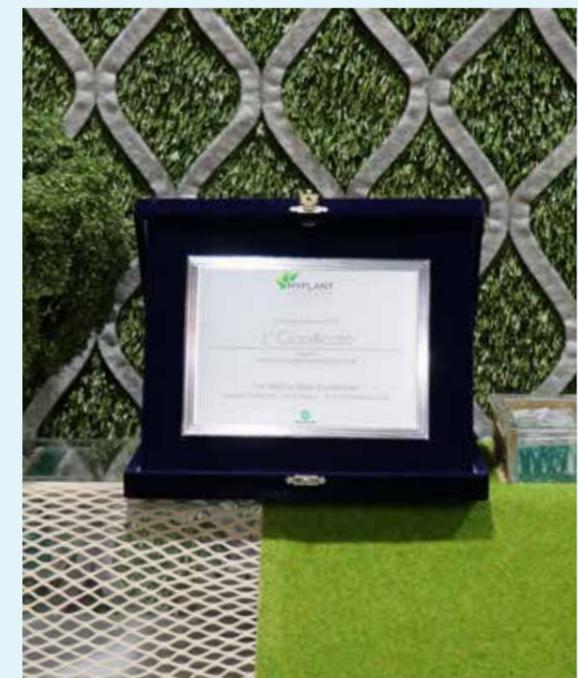
A **sustainable vegetation** is thus guaranteed.

AWARDS



**BLUELITE-NET
SILVER MEDAL
FOR TECHNICAL
INNOVATION
DEMOPARK 2017**

**BLUELITE-NET
1ST PRIZE OF THE
VETRINA DELLE
ECCELLENZE
MYPLANT 2018**



OUR APPLICATIONS



LAWNS AND ATHLETIC FIELDS

PRODUCTS:

LITE-**NET**
BLUELITE-NET
LITE-**STRIPS**

In order to achieve an optimal and sustainable vegetation, LITE-**STRIPS** - mainly as water accumulators - as well as LITE-**NET** - mainly as a water distributor - can be used together.

Both variants can be incorporated 3-dimensionally into the top 30 cm of the soil.

The **BLUELITE-NET** can be installed at any desired depth - optimally adapted to the respective plants - and placed in many layers and shapes. Plants and plant mixes are thus steadily supplied with water and air even during their initial growth phase.

Ideally LITE-**STRIPS**, LITE-**NET** as well as **BLUELITE-NET** can also be placed under lawn turf! For instance, LITE-**STRIPS BIO** can be mixed into the top 5 cm of the soil before the lawn turf is installed. The lawn turf can thus grow in better. LITE-**STRIPS BIO** are 100% biodegradable and decompose after 1 year; they do not only function as a water accumulator, but also create preferential paths for the roots to grow deeper.



**The
lawn can
be used during
irrigation!**



PRODUCTS:

LITE-**NET**

BLUELITE-NET

LITE-**STRIPS**

GREEN ROOFS

Using LITE-DRAINS for roof greenings results in a massive weight advantage!

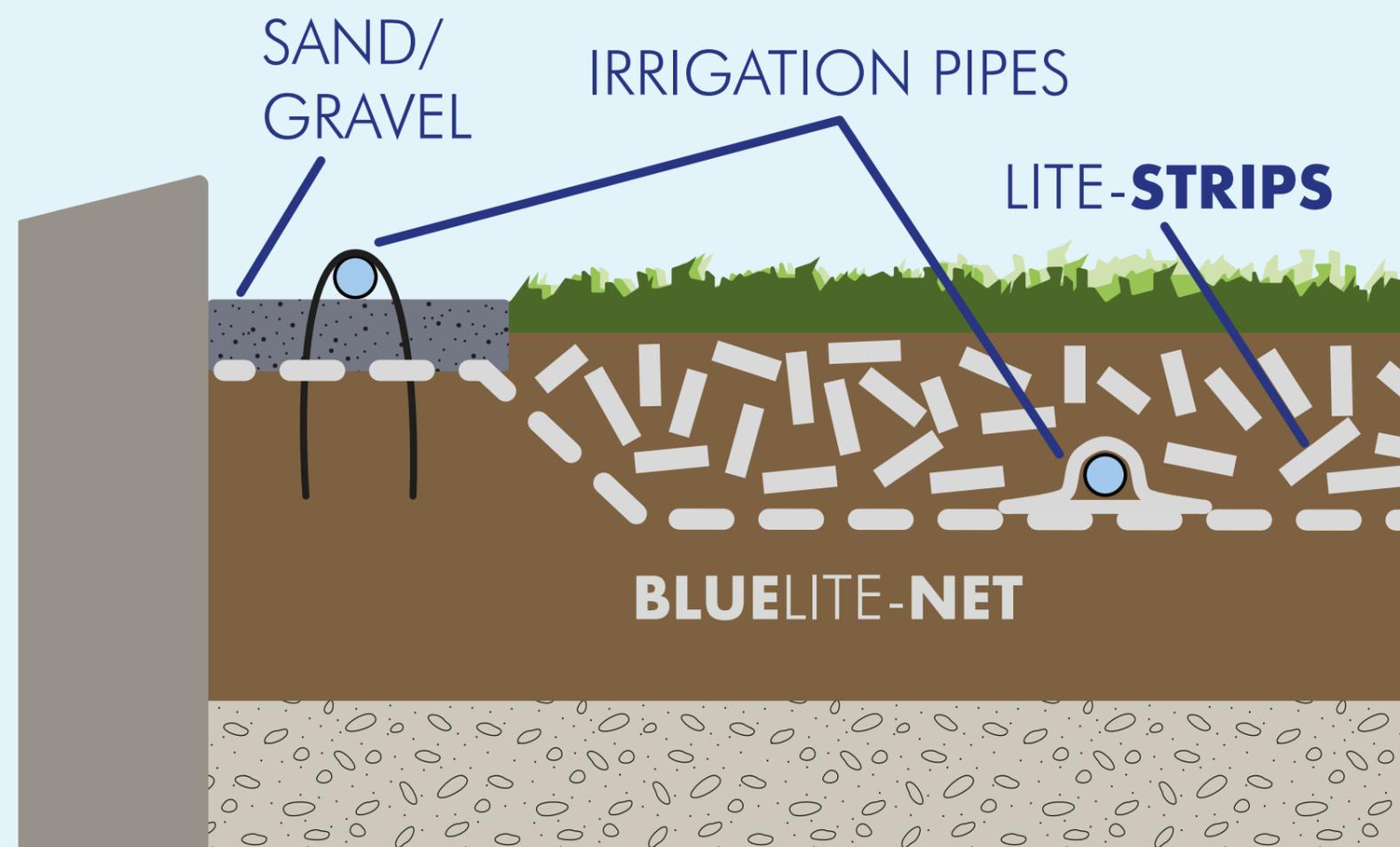
Investigations of the Vienna University Of Natural Resources And Life Sciences (BOKU) have concluded that LITE-**STRIPS** absorb 8 times more water per kg as conventional products (e.g. LECA).

Additionally, installing LITE-**NETS** can result in an **extensive subsurface aeration** and **irrigation**.

In contrast to full-surface irrigation mats, LITE-**NET** allows the roots to **dispose of all the stored water**, as they can access the net from the sides and even from below. The fact that LITE-**NET** can be installed at any desired depth is especially advantageous for thick roof superstructures. The wide net openings can be easily penetrated by the roots, which can also affix themselves to the net.

The active **BLUELITE-NET** irrigation system is also ideally suited for roof greenings and **results in a sustainable vegetation**. Due to the subsurface irrigation, evaporation and felting is effectively prevented and the irrigation pipe is protected against clogging and ingrowing roots.

BLUELITE-NET is durable, cost-efficient and easy to install.





PRODUCTS:

LITE-NET

BLUELITE-NET

LITE-STRIPS

CITY TREES

Climate change and the rise of temperatures increase the need for city trees as “natural air conditioning”. In order to deploy their full potential, trees have to get old. To this end, tree roots need enough space for being able to grow and soil compaction has to be prevented.

By applying LITE-**NETS** with a high water and air transmissivity the plant roots are **irrigated and aerated extensively**, the roots may grow through the net and prevent compaction.

The LITE-**NET** can be used in many different ways, for example by lining it in the plant hole and pulling it to the surface, covering the hole’s walls. For each wall covered by the LITE-**NET**, the interconnected void space is equivalent to a DN 100-tube.

As the nets are slightly elastic, the surrounding soil cannot compact completely.

Cars passing by pump air into the ground and the **vegetation net** improves the static stability of the soil once the roots have grown through it.

Due to all this positive properties, conventional methods like Ringdrain (tubes which irrigate and aerate linearly, but not extensively) can **easily** be replaced in a **cost-efficient** way.

LITE-**NET** is thus **ideal for city trees!**

Additionally, LITE-**NET** can carry water and air below impermeable surfaces (like pavements) in order to supply roots with water and guide their growth.

As a start-up support for rooting the tree (**planting new trees**) the LITE-**NET** in its version of the **vegetation net** is placed directly around the root bales. The **vegetation net** can consist of long-lasting polypropylene or biologically degradable raw material such as wood fibre or PLA. Vegetation nets work ideally with watering bags.

In addition, the LITE-**NET** can be inserted into the whole tree pit as a **tree roots screen**.

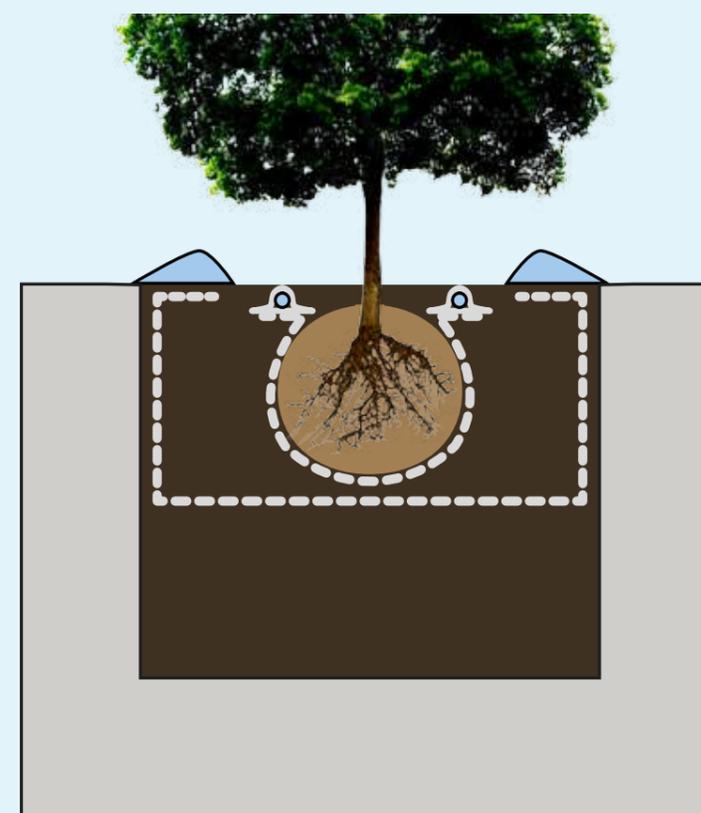
When **moving large trees** the LITE-**NET** is simply inserted extensively as a **tree roots net** into the tree pit and is lifted up to the surface. There it absorbs **air** and **water** in order to spread it most **quickly** and **extensively** at root level. Alternatively the LITE-**NET** is used as a **tree roots screen**.

ADVANTAGES:

- water distribution **over a large area**
- **cost effective**
- do it yourself: **quick** and **easy installation**
- **no buckling** or **blocking**

LITE-**STRIPS** can be mixed into the soil next to the roots as additional water accumulators.

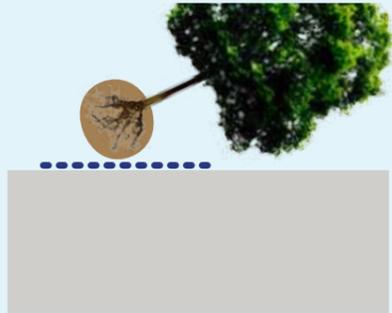
BLUELITE-NET is also ideal for watering city trees:



Bring underground irrigation pipes protected with a nonwoven covering into contact with the vegetation net or the tree roots screen.

PLANTING NEW TREES

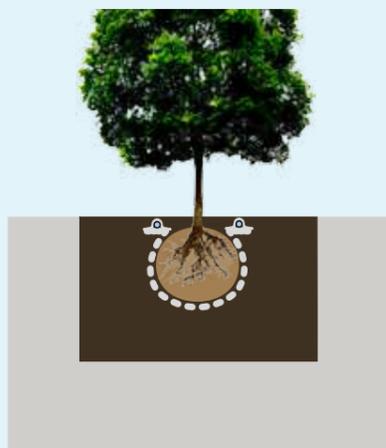
BLUELITE-NET FOR CITY TREES



place root ball on vegetation net
gather and secure around trunk

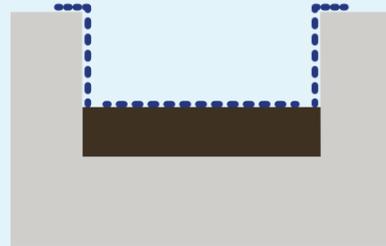


dig hole for root ball
fill soil with special mix
plant tree

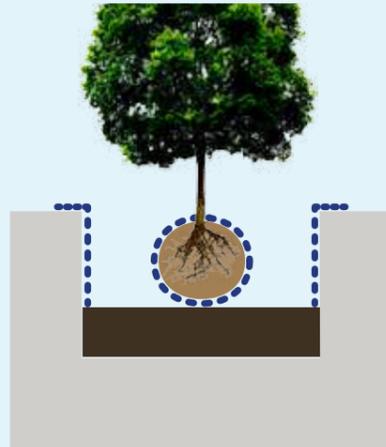


Fill hole with special mix
Install **BLUELITE-NET** irrigation system
Cover with e.g. mulch, wood chips, gravel

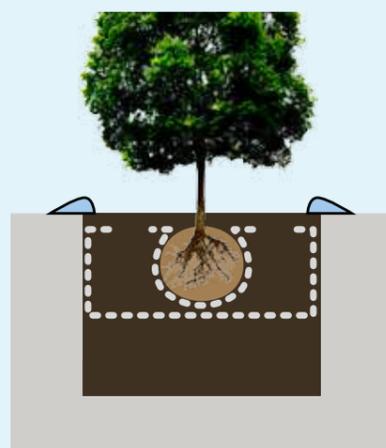
VEGETATION NET + TREE ROOTS SCREEN



dig hole for root ball
fill hole with special mix
position vegetation net +
tree roots screen



remove original woven fabric from root ball, position tree in hole
pull up vegetation net around tree



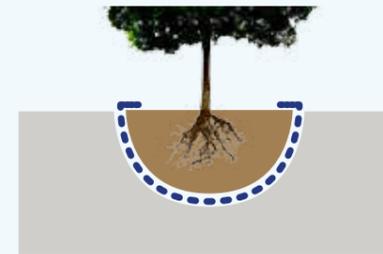
fill hole with special mix
open vegetation net on top
fold tree roots screen on top
optionally cover with e.g. wood slices, etc.

MOVING LARGE TREES

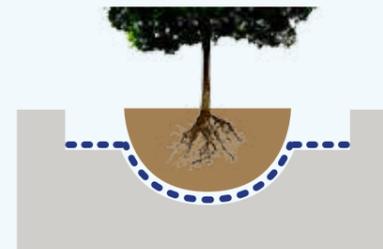
TREE ROOTS NET



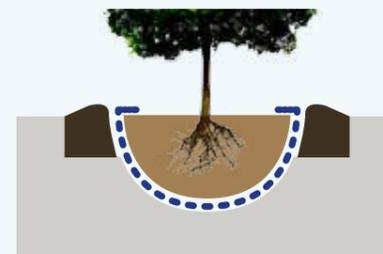
dig hole for root ball
line hole with tree roots net



position tree in hole
pull net towards tree



dig trench
open net
trim protruding roots

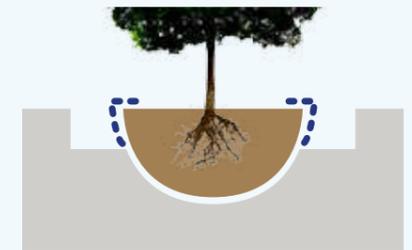


fold net at the top
fill trench with special mix
optionally install irrigation ring

TREE ROOTS SCREEN



dig hole for root ball
position tree in hole



dig trench
trim protruding roots
place tree roots screen around
top of the root ball



fill trench with special mix
optionally install irrigation ring



VEGETATION NET



VEGETATION NET + BLUELITE-NET



TREE ROOTS NET



TREE ROOTS SCREEN



PRODUCTS:
LITE-NET
LITE-STRIPS
LONGLITE-STRIP

RAISED PLANTING BEDS, PLANT BOXES AND PLANT POTS

LITE-**STRIPS** are used in raised planting beds and plant boxes, particularly because of their high water storing capacity. In order to prove the positive effects of LITE-**STRIPS**, the University of Natural Resources and Life Sciences Vienna (BOKU) has carried out extensive laboratory tests.

The results are impressive:

LITE-**STRIPS** mixed with soil retain **8 times more water** than expanded clay beads.

The installation of LITE-**NETS** – approx. 15-20 cm subsurface, lifted on both sides, retracted and filled with water-penetrable material like wood chip– allows an **extensive underground irrigation and aeration** in a simple way.

The **LONGLITE-STRIP** can be cut off very easily from a roll (e.g. 4 cm width, 10 m long) in any length and put into the soil as an excellent water storage.

The cost effective LITE-**NET** as well as the LITE-**STRIPS** and **LONGLITE-STRIP** for raised planting beds and plant boxes are available in two basic versions: made of long-lasting polypropylene or biologically degradable raw material such as wood fibre or PLA.

An extremely simple installation and a **lush plant life** are guaranteed!



LITE-STRIPS CAN STORE 8 TIMES MORE WATER THAN CONVENTIONAL CLAY AGGREGATES (LECA)

SLOPES

PRODUCTS:

LITE-**NET**

BLUELITE-**NET**

LITE-**STRIPS**

For **slope greening**, LITE-**NET** is stretched to multiple times its size and placed on the surface. The extremely flexible net adapts perfectly to the soil, **increases vegetation** and **reduces possible erosion**. LITE-**NET** is ideal for hydroseeding.

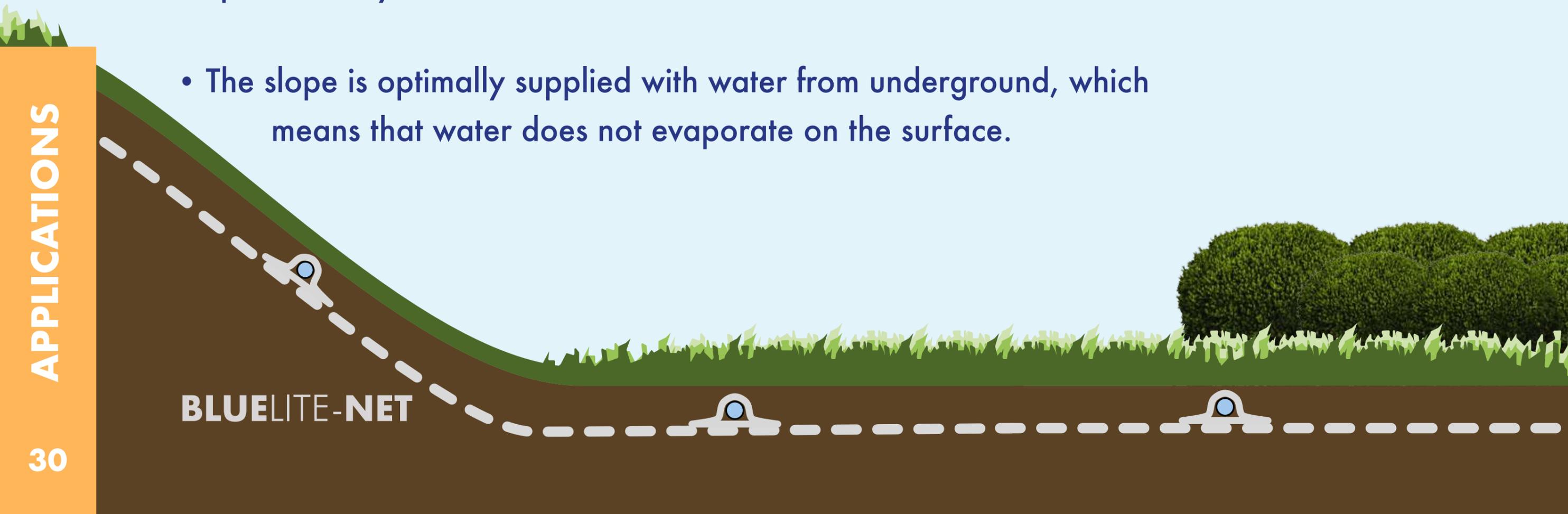
According to research carried out by the University of Natural Resources and Life Sciences Vienna (BOKU):

- LITE-**NET** retains approx. two times more water than a common coir mat,
- the nonwoven net retains even **6 times more water** than the coir mat after 24 hours,
- the innovative net irrigates new plants much better on a durable basis, thus enhancing their capacity to grow in and attach to the slope,
 - the vegetation effect with LITE-**NET** is **more than 50% higher** than with the coir mat.
 - The patented nonwoven net is **significantly more flexible** than the coir mat and hence perfectly adapts to the surface of the slope, thereby reducing erosion substantially.
 - The installation is very simple. For steeper slopes, the nets can be fixed with conventional ground hooks.



BLUELITE-NET is also ideally suited for watering slopes, especially when they are highly exposed to the sun.

- Due to the subsurface deployment, **BLUELITE-NET** is well protected against acts of vandalism.
- The open net structure does not produce sliding areas, thus increasing the slope's stability.
- The slope is optimally supplied with water from underground, which means that water does not evaporate on the surface.





PRODUCTS:
LITE-STRIPS BIO

LAWN TURF

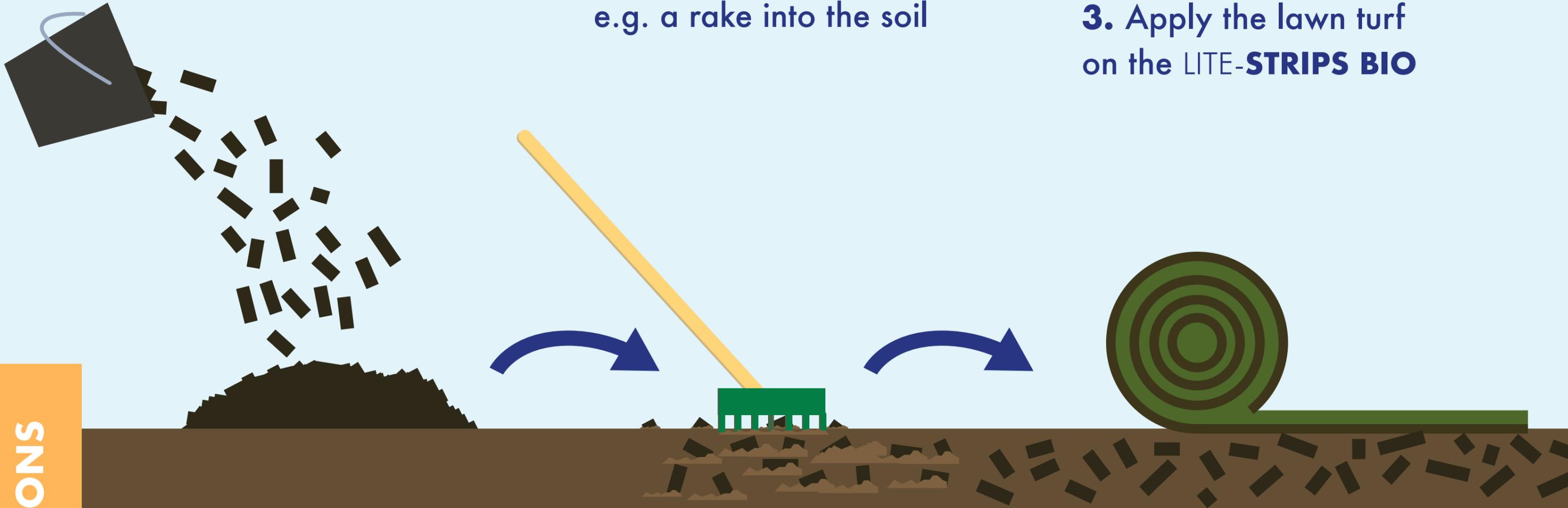
APPLICATIONS

31

1. Apply the
LITE-**STRIPS BIO**
on the soil

2. Insert the
LITE-**STRIPS BIO** with
e.g. a rake into the soil

3. Apply the lawn turf
on the LITE-**STRIPS BIO**



The LITE-**STRIPS BIO** improve and aid the lawn turf's initial growing phase, while degrading biologically after one year once inserted into the soil



PRODUCTS:

LITE-STRIPS

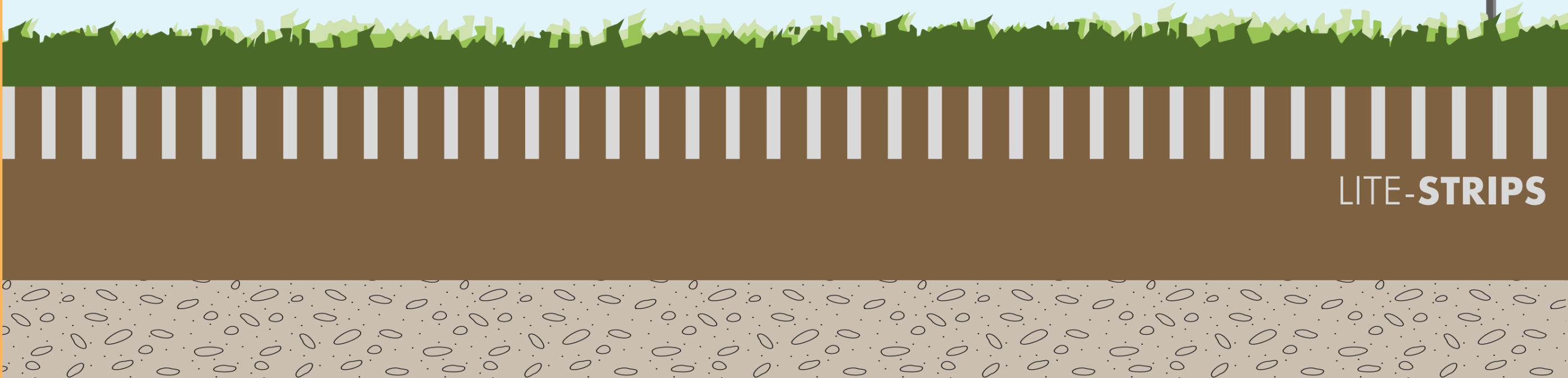
AERIFICATION OF GOLF COURSES AND LAWNS

For **aerating** lawns the LITE-**STRIPS** are inserted vertically into the underground.

Water and air from the surface are discharged in the subsoil. This process reduces the roots' felting so they grow at a deeper level. By transmitting the **water quickly** from the surface **to the soil** the effects of **water-logging** and **evaporation** are reduced.

This innovative technology of **aeration** offers long-lasting benefits.

Additionally, LITE-**STRIPS** can be mixed **into the soil**. With their extremely high water storing capacity they supply the plants in the **long term** and the intervals for artificial irrigation are extended significantly. After applying **compressed air aeration**, a simple and cost-effective permanent aeration via LITE-**STRIPS** is beneficial.



DRAINAGE FOR FILTER BASINS

PRODUCTS:

LITE-**NET**
LITE-**STRIPS**



The LITE-**NET** as an **extensive drainage** absorbs the water at the surface of the distribution launders and distributes it underground e.g. 5 cm deep extensively and equally over the filtering area, as a result:

- + **less water** stays at the surface
- + **water is generously distributed** into the soil
- + **felting is reduced**
- + **water permeability** in the top soil is increased
- + **less verticulation** is necessary
- + **permeability** of the soil is preserved

- + **roots** are encouraged to grow **down to the aquiferous layer**

- + **plant growth** is encouraged

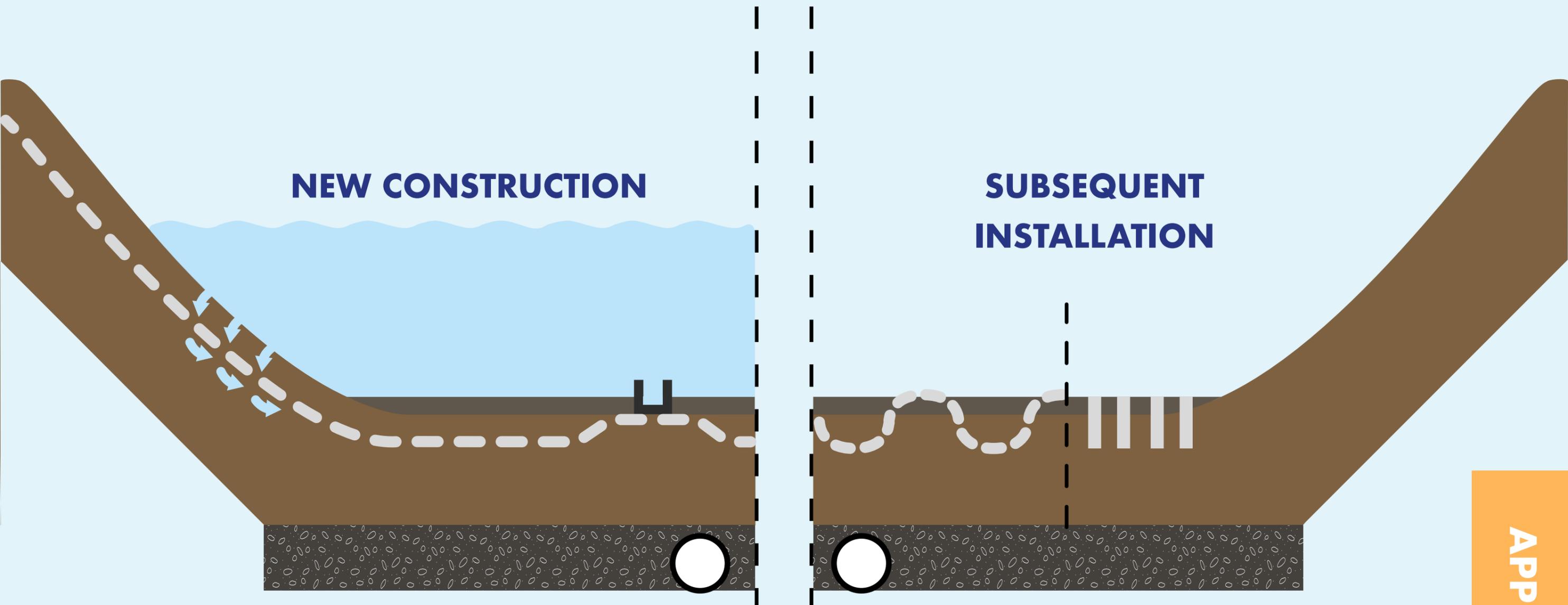
- + the filter basin is more easily accessible e.g. for mowing

LITE-**NET** can also be installed in an **undulating** way as **sludge drainage**. Thus water is drained extensively from the surface down through the sludge into the underground, as a result:

- + the complete sealing of the surface by fine particles is **prevented**

- + the **lifetime** of the **filter basin** is increased significantly

FILTER BASINS FOR STREETS AND PARKING AREAS



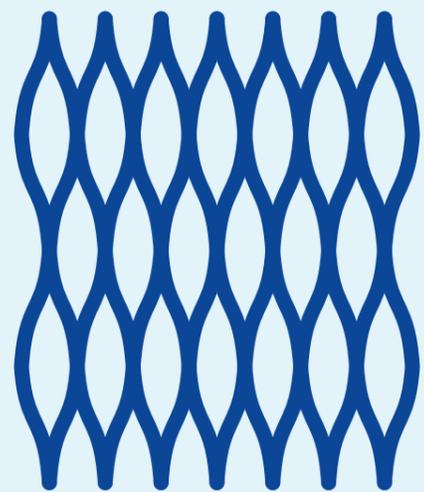
LITE-**NET** can conduct water from silty filter basins into the drainage layer.

In case of already built, but silty filter basins, LITE-**NET** or LITE-**STRIPS** can drain the water through the silt layer into the drainage layer.

FURTHER APPLICATIONS

- **AERATION OF TREE ROOTS**
- **CEMETERY PLANTING**
- **DISPOSAL SITES**
- **EROSION CONTROL**
- **ROADS AND PAVEMENTS**
- **FILTER BASINS**
- **SOCCER FIELDS**
- **HORTICULTURE AND LANDSCAPING**
- **CEMETERY PLANTING**
- **SUNBATHING AREAS**
- **SIDE ROADS**
- **PARKING AREAS**
- **SEWAGE TREATMENT PLANTS**
- **PLANTATIONS**
- **GRASS PAVERS**
- **RIDING ARENAS**
- **LAWN TURFS**
- **SKI SLOPES**
- **BARRAGES**
- **ROAD AND RAILWAY EMBANKMENTS**
- **BANK PROTECTION**
- **VEGETATION AND BEARING LAYER**
- **EVENT LOCATIONS**
- **SEEPAGE RESERVOIRS**
- **INFILTRATION OF RAIN WATER**
- **VITICULTURE**
- **GREENING OF DESERTS**
- **ETC.**

OUR RESEARCH



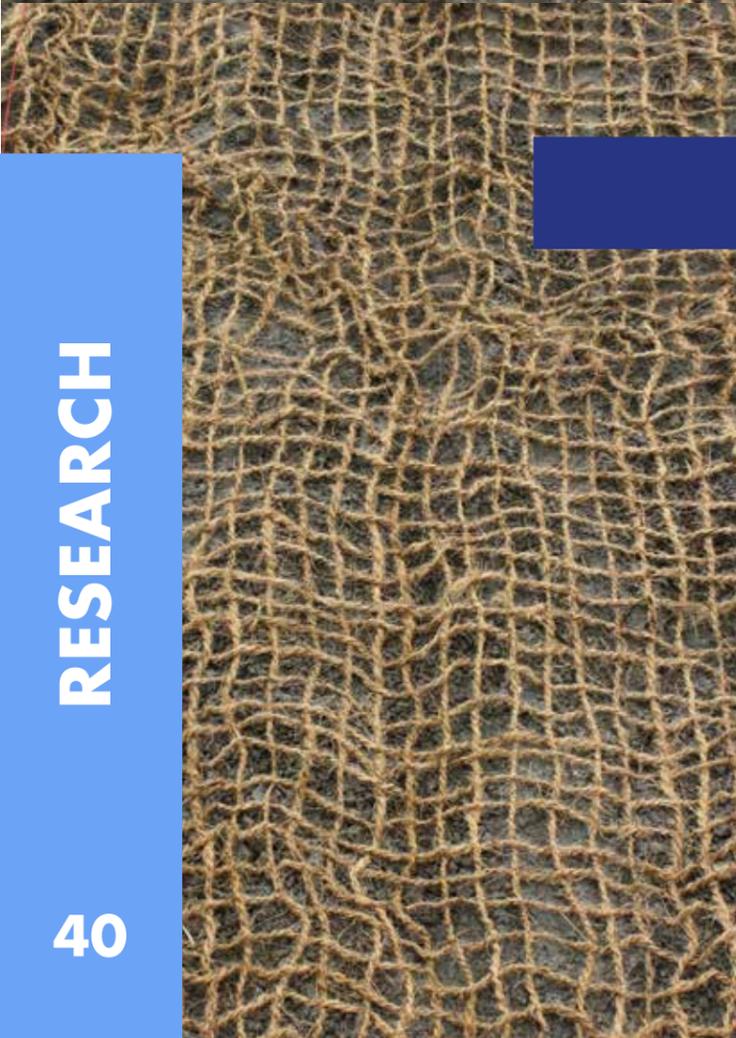
LITE-SOIL

All in ONE: Air-Soil-Water





**BEFORE
VEGETATION**



**WITH
COIR MAT**

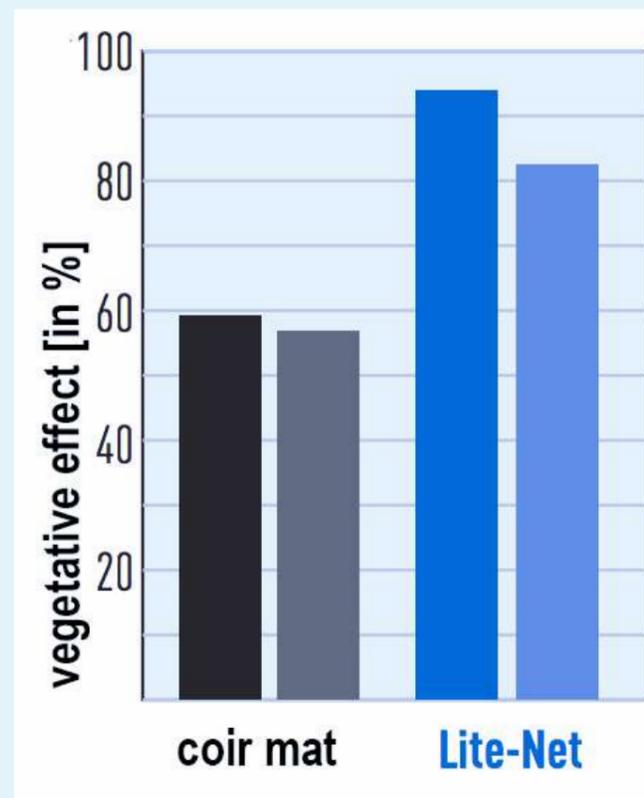


**WITH
LITE-NET**

INFLUENCE OF LITE-NET ON SLOPE GREENINGS

The goal of the field experiment was to determine the influence of LITE-**NET** on the plant growth on vegetated slopes. Particular focus was given on the LITE-NET compared to conventional coir mats.

On a test slope a coir mat, a LITE-**NET** and different combination mats with integrated biological superabsorbants, substrates and



fertilizers – partly underground – were applied and compared after a period of three months under extremely dry climatic conditions.

TEST RESULTS:

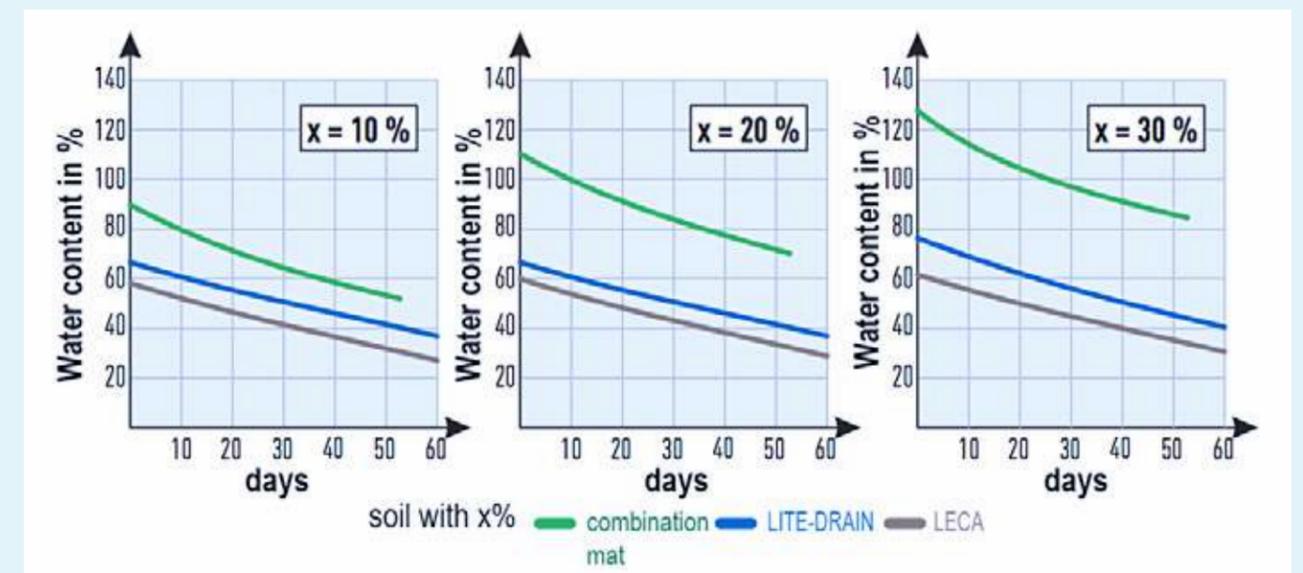
- After 24 hours, the LITE-**NET** showed an approx. **6 times higher storage capacity** per kg as the coir mat
- The flexible nonwoven net **adjusted better to the unevenness of the surface**, thereby offering a higher erosion protection
- The uncovered nonwoven net had a **significantly higher vegetative effect** on the growth of the plants compared to coir mats (covering rate 93% vs. 59%)

WATER ABSORPTION AND STORAGE CAPACITY OF HUMUS MIXED WITH LITE-STRIPS

The goal of the investigation was to determine to which extent LITE-**STRIPS** can improve the water absorption and storage capacity of soils, thereby increasing their stability against erosion. For comparison reasons, expanded clay beads (LECA) and combination nonwovens (LITE-**NET** with integrated biological superabsorbants, substrates and fertilizers) were mixed into different types of soil and tested.

The soil mixtures were filled into planting pots which were fully saturated with water, and

placed on a grid for 24 hours to allow surplus water to run off. Then the water content was determined. For the following weeks, no additional water was applied and the pots were weighed daily. The water contents over time are illustrated in the diagrams below.



TEST RESULTS:

- The **water absorption capacity per volume** of LITE-**STRIPS** is more than **50% higher** than that of LECA. The values achieved with combination mats are even up to **17 times** higher compared to LECA
- The water absorption capacity per kg of LITE-**STRIPS** is approx. **8 times higher** than that of LECA. The combination mats exceeds the results of LECA even by the **50-fold**
- A 10% content of combination mat increases the water content by **47%**

AFTER A DRYING PERIOD OF 30 DAYS:

- The humus **water content** of approx. **37%** remains almost unchanged when LECA is added (36-40%). The LITE-**STRIPS** however increase the water content to **41-51%**, the combination mats even up to **59-94%**.
- Per volume of inserted elements, an approx. **60-80% higher water absorption** of LITE-**STRIPS** is achieved compared to LECA. When weight is taken into account (which is important for flat roofs), 1 kg of nonwoven strips can store approx. **8 times more water** than 1 kg LECA.

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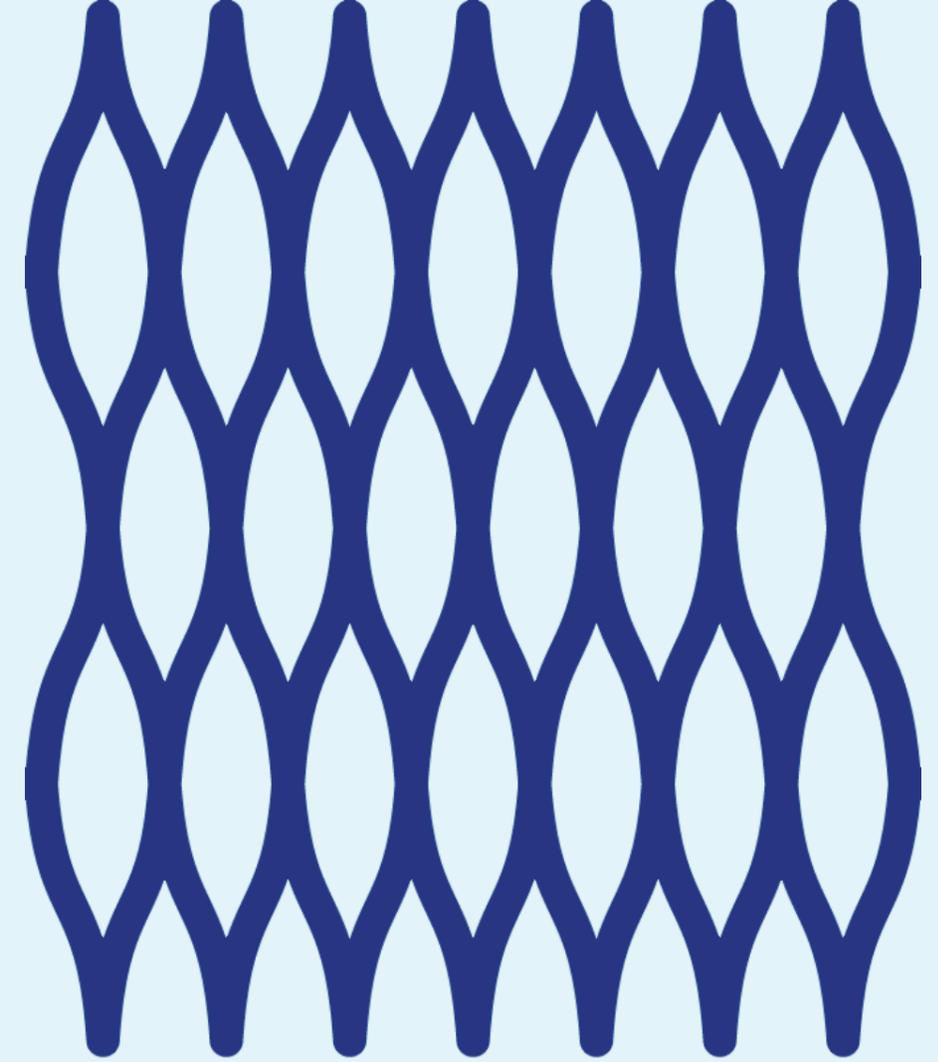
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LITE-SOIL

All in ONE: Air-Soil-Water

