EIA Autumn Irrigation Forum
18 October 2024

TOGETHER FOR SUSTAINABLE IRRIGATION

The housekeeping rules
EIA Code of Conduct

- EIA believes it is important that its activities are at all times carried out in accordance with the applicable law, especially competition law.
- EIA believes that business shall be conducted in an atmosphere of free competition, i.e. based on price and quality.
- The Code of Conduct aims at providing clear rules to EIA's members, thus reducing the risk of improper conduct and consequently of fines being imposed.
- This Code of Conduct shall be binding on all members as well as all other participants when taking part in EIA activities.

Agenda for this forum

14:00 -14:20	**Opening** **Introduction**	Moshi Berenstein/ EIA President
14:20 -14:30	**Welcome & introduction of New Members**	Fleur Martin/ EIA Communication Officer
14:30 -15:00	**Guest speaker :** **Spring rainwater in urban areas**	Nicolas Griglio / Operating Manager, Source Urbaine
15:00 -15:30	**Innovation and Technology session :** **Sub-surface irrigation and water storage technologies for sustainable greening & water saving in gardening & landscaping.**	Dorothea Sulzbacher / General Manager, Lite Soil
15:30 - 16:00	**Open session for Q&A**	

What’s new in the association

1. WG1 Sustainable irrigation : promoting the EIA policy paper on European Taxonomy. Organizing a Round Table on sustainable irrigation in Brussels
2. WG2 Urban Landscape – identifying efficiency of urban irrigation
3. WG4 Training & Education - working on basic training for Landscape auditors' course
4. Changes in Secretariat services and new services proposed to EIA members by Aliénor
5. 2025 Road map board discussions
6. Preparations for the EIMA Exhibition in Bologna Italy: EIA stand, networking & Gathering cocktail

Welcome to new members

- **We are very pleased to welcome 3 new members in the association since our latest forum, in April**

- **Today, we are counting 82 members**

Quality Irrigation Water Savings
EUROPEAN IRRIGATION ASSOCIATION

hydrascout®
soil moisture management by HSTI

www.hydrascout.co

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Présentation HSTI

DATE

PLACE

Who we are?

HSTI France is the only soil moisture probe manufacturer in Europe.
Small team of 9 people
Our core business is to manufacture and distribute our probes.

We can custom build the probes, they range from 100 mm to 1500 mm, and you can add/remove sensors at different depth. Offering a 5 year warranty on our products.

We can offer the probes ob their own or as a solution (probe+telemetry+software) depending on the need.

Probes are manufactured in Aix En Provence (France) and we distribute in the entire world via our resellers & distributors.

Merci pour votre attention

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Our members

eia
ation Water Savings
AN IRRIGATION
OCIATION

SOURCE URBAINE

A solution inspired by nature for a sustainable and environmental-friendly city

EIA presentation – 18th of octobre

The evolution of urban environment

The effects of climate change are intensifying (drought, fires, floods, etc.).

Since the end of the 20th century, the urban development model is no longer adapted to these meteorological changes and is accentuating the phenomena of soil sealing and heat spots in urban areas.

Today's cities lack the resilience and solutions to meet these new challenges.

Underground buffer tanks

Infiltration

Greenroof

Green city

Sponge city

Creating a sustainable city

Progressive interest in nature and natural resources to manage rainwater and combat the effects of global warming

- Storage and disposal of wastewater
- Developing nature in the city (green roofs and façades, nature-based solutions)
- Natural evapotranspiration
- Gradual inclusion in regulations)

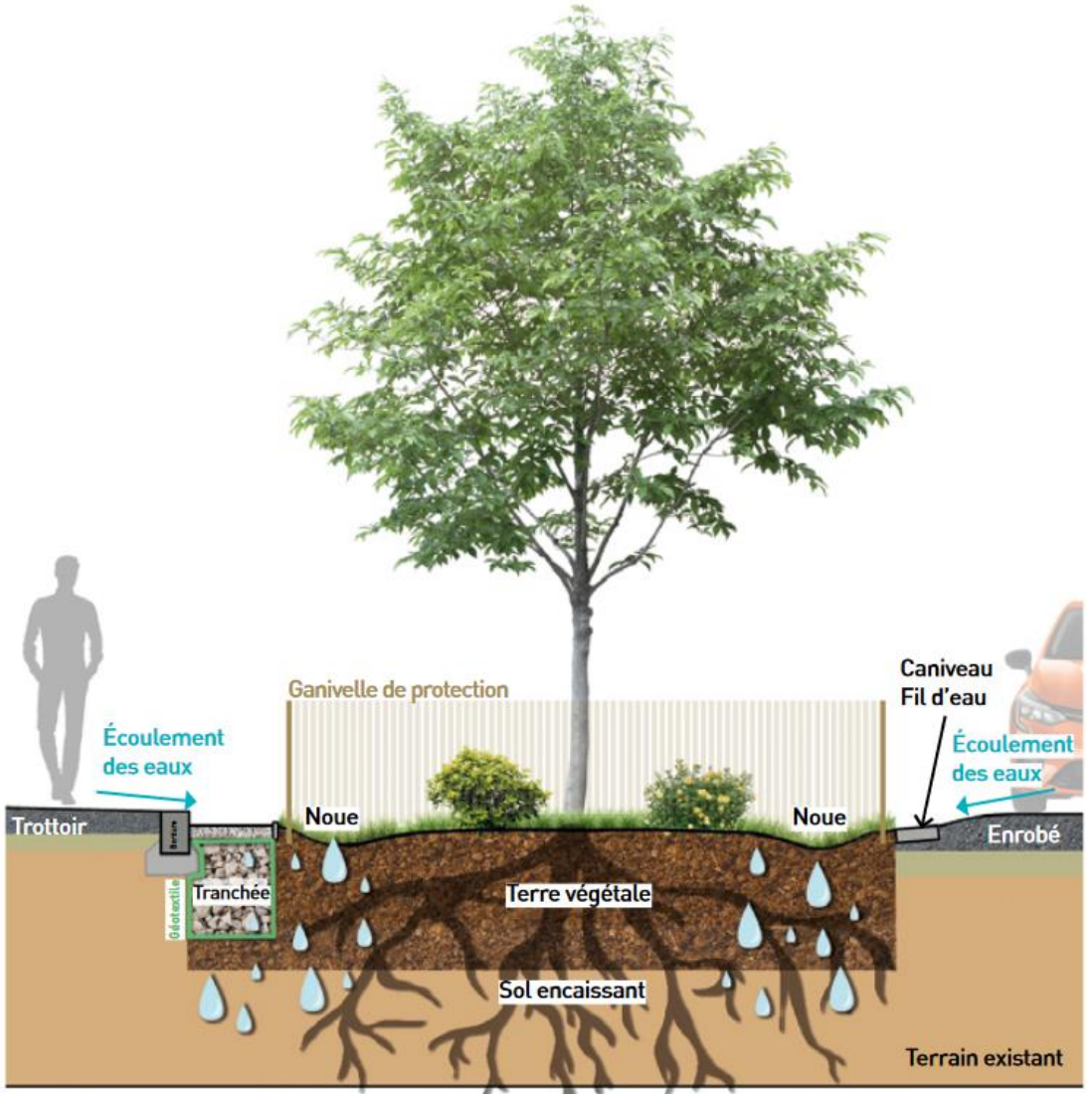
The concept of our Urban Rain Garden is the logical continuation of these developments.

- A ground-level solution for sloping roofs
- Bringing vegetation to the city
- Promote evapotranspiration from plants in summer, even during droughts

SOURCE URBAINE
L'eau de pluie pour irriguer la ville verte

New examples

The rain tree



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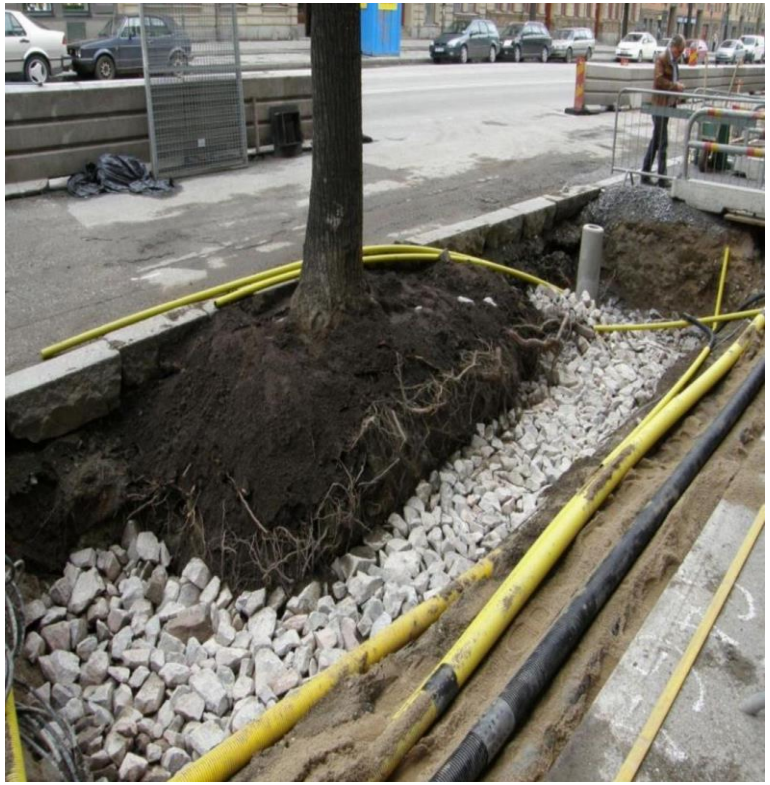
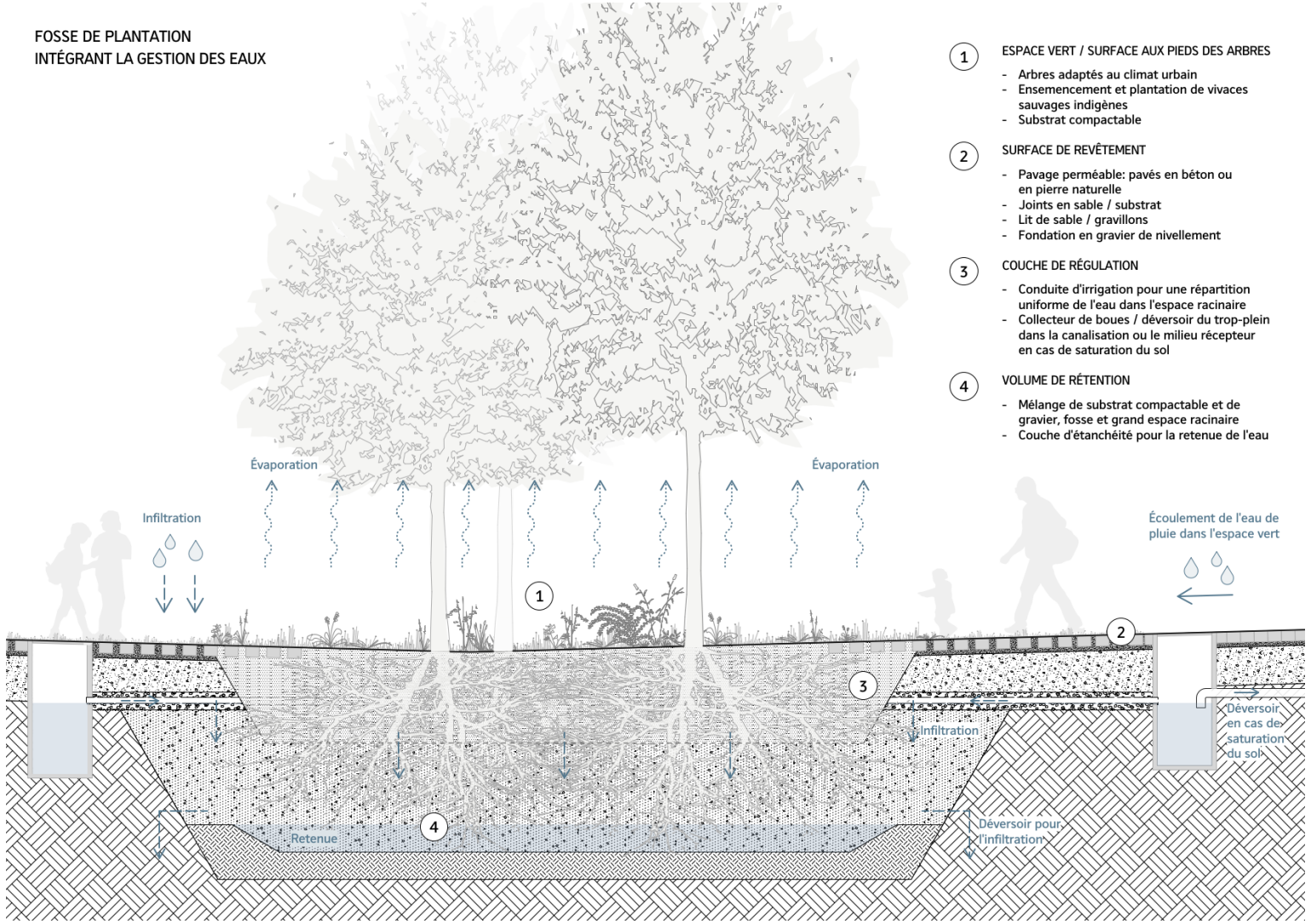
The Stockholm system



FOSSE DE PLANTATION
INTÉGRANT LA GESTION DES EAUX



1 ESPACE VERT / SURFACE AUX PIEDS DES ARBRES

- Arbres adaptés au climat urbain
- Ensemencement et plantation de vivaces sauvages indigènes
- Substrat compactable

2 SURFACE DE REVÊTEMENT

- Pavage perméable: pavés en béton ou en pierre naturelle
- Joints en sable / substrat
- Lit de sable / gravillons
- Fondation en gravier de nivellement

3 COUCHE DE RÉGULATION

- Conduite d'irrigation pour une répartition uniforme de l'eau dans l'espace racinaire
- Collecteur de boues / déversoir du trop-plein dans la canalisation ou le milieu récepteur en cas de saturation du sol

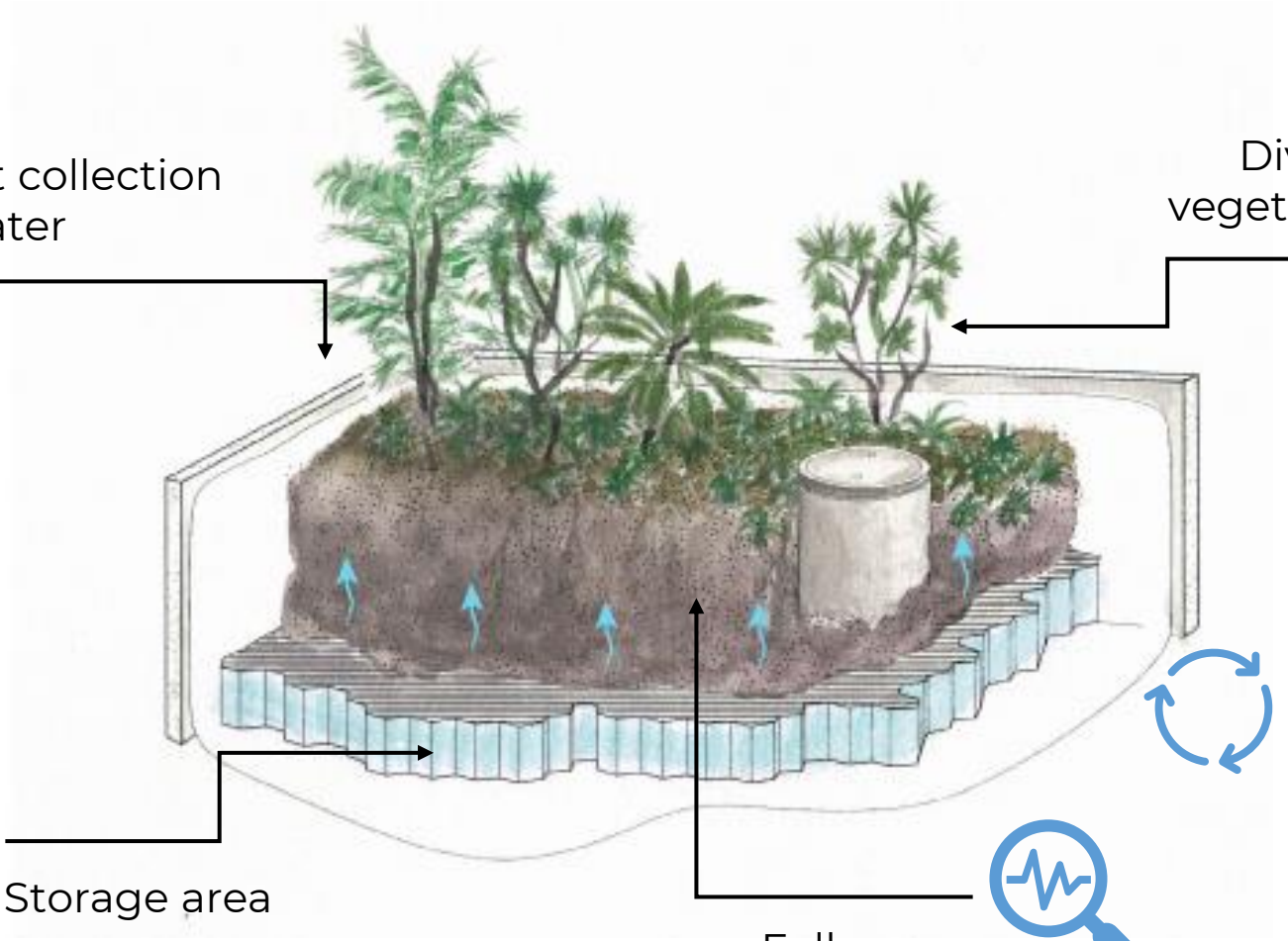
4 VOLUME DE RÉTENTION

- Mélange de substrat compactable et de gravier, fosse et grand espace racinaire
- Couche d'étanchéité pour la retenue de l'eau

SOURCE URBAINE
L'eau de pluie pour irriguer la ville verte

An ideal solution fur urban areas

The Urban Rain Garden uses and reinforces the natural principle of evapotranspiration. Thanks to the continuous collection of rainwater, it treats it and stores it in a reserve to feed a real urban garden, even in times of drought.



Cool spots in the city

The plants and soil's natural evapotranspiration process is multiplied by the constant supply of water, helping to lower the air temperature in the vicinity of the Urban Rain Garden.

SOURCE URBAINE
L'eau de pluie pour irriguer la ville verte

Evapotranspiration is under evaluated

	Common green roof			Green roof w/ storage	Urban Rain Garden	
	TTV 1	TTV 2	TTV réserve 1	TTV réserve 2	JPU1	JPU2
rapport impluvium/substrat planté	1	1	1	1	4	6
épaisseur stockage (cm)	0	0	15	10	50	50
épaisseur substrat (cm)	5	15	5	30	15	50
type de plantes	sedum	sedum	sedum	selection toundra	vivace zone humide	vivaces grandes feuilles
Moyenne coef K saison ETR/ETP	0,1	0,3	0,4	0,4 à 0,9	3,7	6,5

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2024 projects

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2024 projects

Soyaux

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Soyaux

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Soyaux

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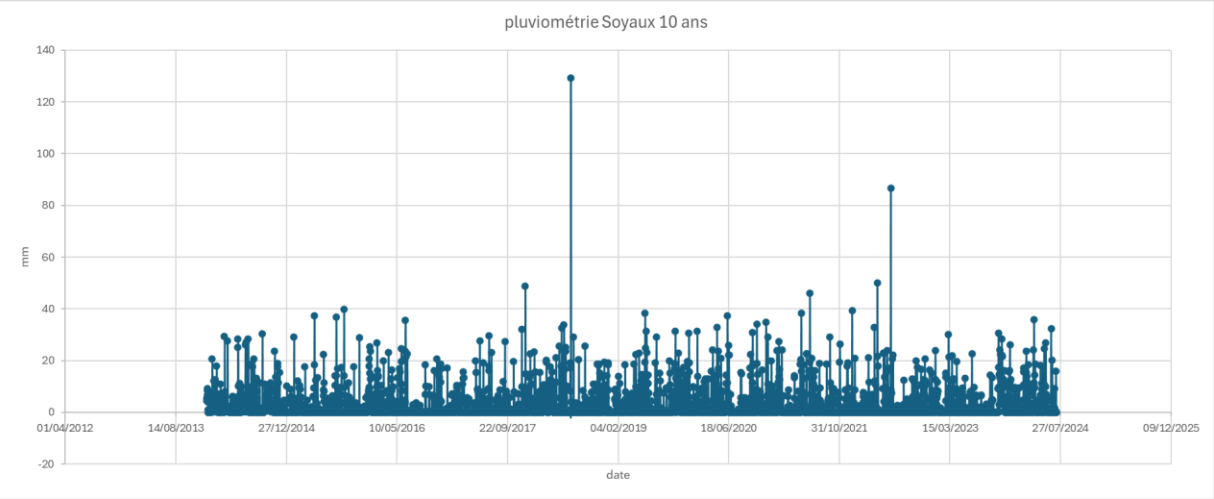
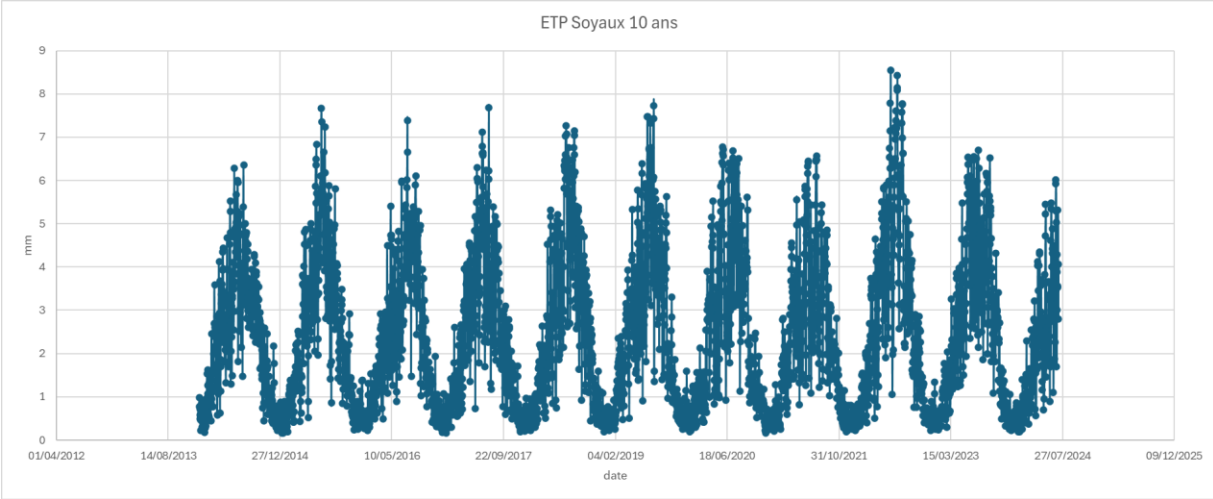
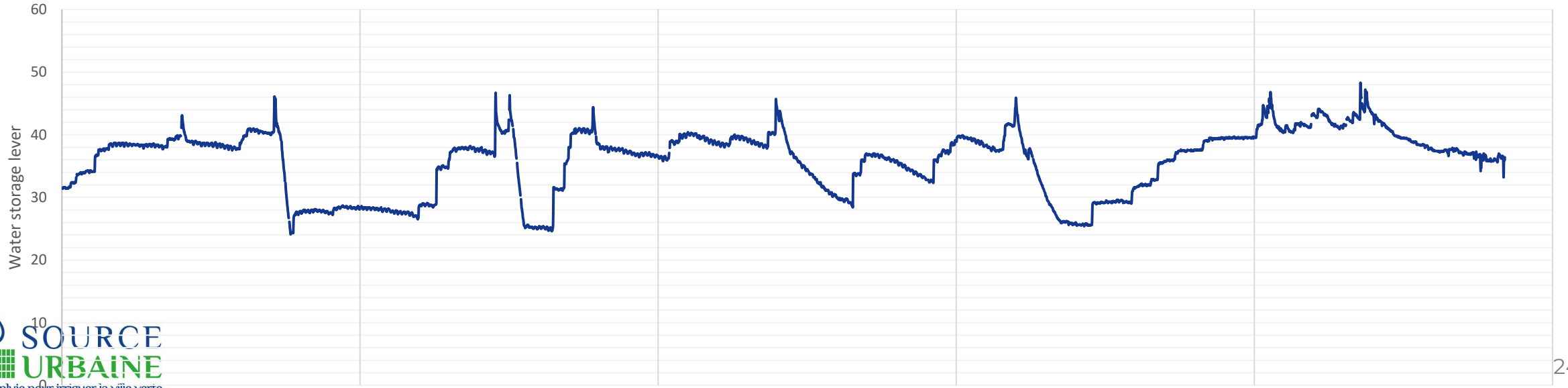
L'eau de pluie pour irriguer la ville verte

Expectations & forecast





Water level follow-up



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L'eau de pluie pour irriguer la ville verte

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L'eau de pluie pour irriguer la ville verte

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Flash this QR to have a chat

Thank you

Our Partners


LITE-SOIL®
All in ONE: Air-Soil-Water
Sub-surface irrigation and water storage technologies for sustainable greening
& water saving in gardening & landscaping

OVERVIEW

1. CONVENTIONAL SURFACE IRRIGATION
2. CLIMATE CHANGE & CONSEQUENCES FOR PLANTS
3. SOLUTION? SUBSURFACE IRRIGATION
4. SUBSURFACE TEXTILE IRRIGATION SYSTEMS
5. SUBSURFACE TEXTILE IRRIGATION SYSTEMS compared to surface irrigation
6. COMPARISON OF THE DIFFERENT SUBSURFACE SYSTEMS

a) Tubes with and without coating
b) Full surface textile systems + (coated) tube
c) Net surface textile system + coated tube

7. SUBSURFACE TEXTILE WATER STORAGE & DISTRIBUTION

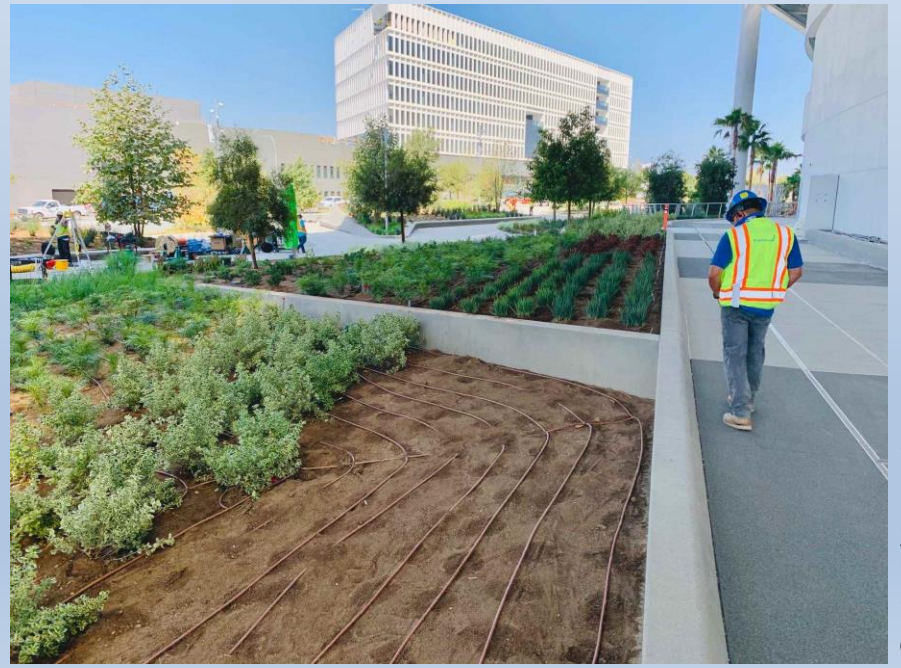
1. CONVENTIONAL SURFACE IRRIGATION with sprinklers or drippers

ADVANTAGES:

- **Cost effective**
- **Visual check**
- **Easy to automatize**
- **Flexible**
- **Easy to renew**

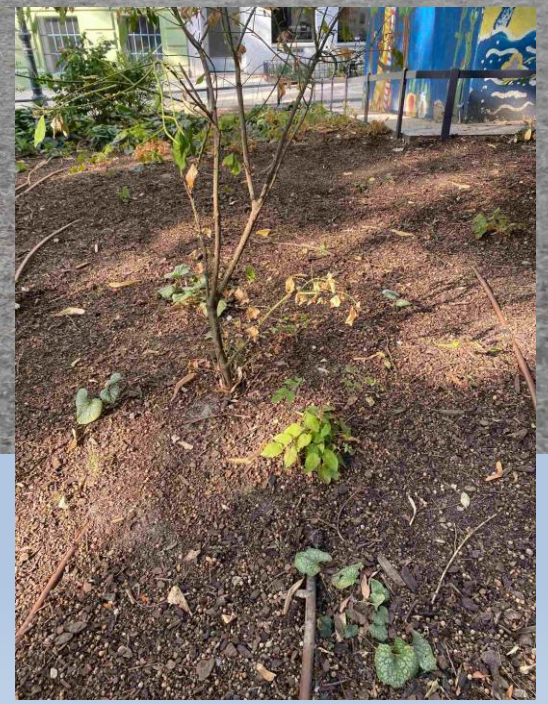
DISADVANTAGES:

- **Evaporation of valuable drinking water**
- **Wind drift**
- **Drip tubes and pop-up sprinklers get damaged by UV, heavy loads and vandalism**
- **Possible high water consumption**
- **Mowing or walking not possible during irrigation**
- **Risk of surface felting with soil compaction**
- **High sensitivity to climate change**



2. CLIMATE CHANGE AND CONSEQUENCES FOR THE PLANTS

Copernicus Climate Change Service (C3S) 9th October 2024:
„The global mean temperature anomaly for January-September was 0.71°C above the 1991-2020 average and 0.19°C warmer than the same period in 2023. This makes it very likely that **2024** will end up as the **warmest year** on record”*1



*1 Data source: ERA5 • Reference period: pre-industrial (1850–1900) Credit:

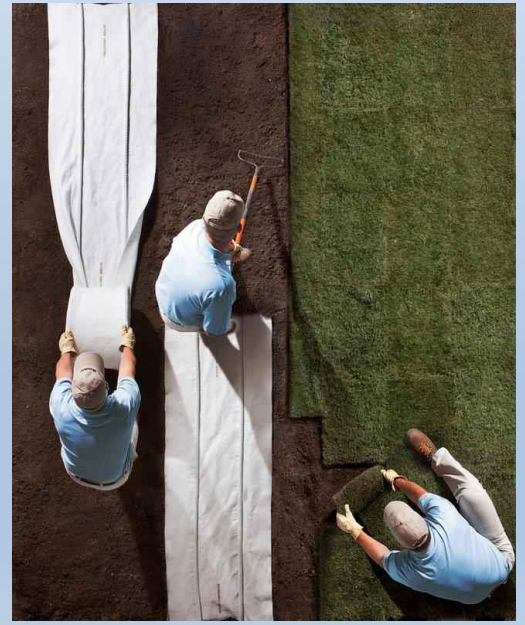
3. SOLUTION? SUBSURFACE IRRIGATION

a) Subsurface drip irrigation (SDI),
sometimes in combination with hydrogels.
Mostly used in agriculture.

b) Subsurface textile irrigation systems (STI).
Mostly used in gardening and landscaping.

© Rain Bird Corporation

SDI



© Photo courtesy of Hunter Industries Incorporated.

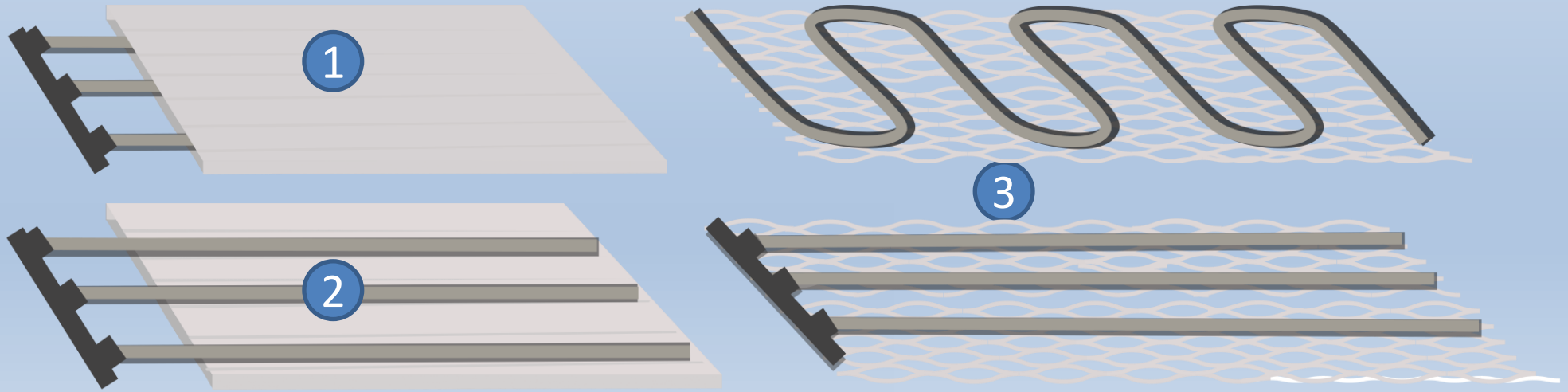
STI

4. SUBSURFACE TEXTILE IRRIGATION SYSTEMS

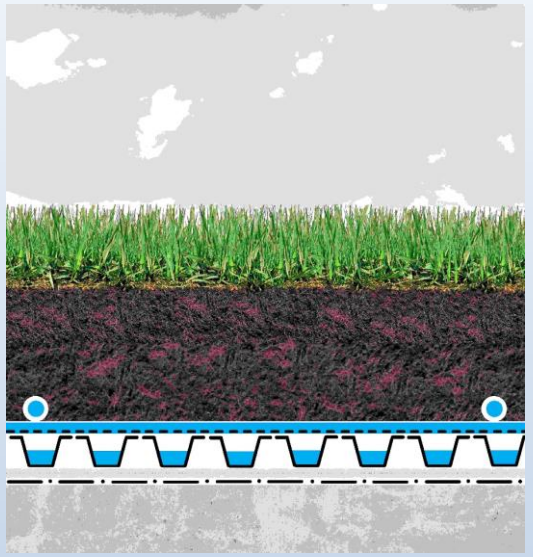
- Usually nonwovens with an air void content of 80-90% are used – a lot of water can be stored internally in these pores and distributed by capillary action. Some of these nonwovens store more than 10 liters water/kg
- The systems are installed usually at root depth in order to utilize water as effectively as possible
- Drip irrigation tubes are mostly protected by a nonwoven so that roots cannot grow in
- In the case of individually coated tubes, the leaking water is distributed longitudinally in the non-woven coating, transferred to the underlying nonwoven via contact and distributed over the surface

<u>Various options for installing the tubes:</u>

a) embedded between 2 full-surface textiles 1
b) individually wrapped and placed on either a full-surface textile 2
c) or a textile net 3



4. SUBSURFACE TEXTILE IRRIGATION SYSTEMS with (coated) tubes



full-surface textile with non-coated drip irrigation tubes (roof greening example) – tubes placed on drainage layer

net-shaped textile with coated drip irrigation tubes (roof greening example) – system placed individually at root level

4. SUBSURFACE TEXTILE IRRIGATION SYSTEMS ENLARGEMENT of the nonwoven material

- Air void content of normally 80-90%
- In the pores, an extremely large amount of air and water can be stored internally and distributed capillary
- PP and PES materials are mainly used for irrigation

5. SUBSURFACE TEXTILE IRRIGATION SYSTEMS compared to SURFACE IRRIGATION

ADVANTAGES:

- Water savings of up to 70% *), compared to spray irrigation in very hot countries, where the water already partially evaporates in the air and wind drift occurs. Normally and in European climates, the savings compared to sprinkler irrigation are significantly lower, with high variation. And even less with surface drip irrigation
- The area can also be used, played on or mowed during irrigation
- Less matting, weeds and waterlogging on the surface, thus reducing maintenance costs, evaporation and surface runoff on slopes
- Even and effective water distribution directly at root level
- Less seepage loss
- Protected components, no vandalism
- Less fertilizer required, as it can be applied precisely to the roots in the right dosage

- The distance between the tubes can be significantly increased with a nonwoven

DISADVANTAGES:

- Higher initial costs
- Not flexible in case of change of plants
- No visual function control, therefore use of moisture sensors is advantageous
- You have to be careful with aerification measures
- Initial surface watering may be necessary until roots are deep enough

*) Dodds, Graeme (February 2011), Achieving Sporting Field Management in Western Sydney: A Study of Sustainable Demand Report Phase 1

6. COMPARISON OF THE DIFFERENT SUBSURFACE SYSTEMS

6a. (COATED) TUBES FOR SUBSURFACE IRRIGATION

© Rain Bird Corporation

subsurface drip irrigation tube (STI) - non coated

© Photo courtesy of Hunter Industries Incorporated.

subsurface drip irrigation tube - coated (STIC)

- STI + STIC more sustainable alternative to conventional surface drip irrigation
- STI + STIC uses water more effectively and reduces evaporation - water delivered directly to the plant's roots

ADVANTAGES STIC COMPARED TO STI:

- Tube protection from root ingrowth mechanically + protective nonwoven covering distributes the water immediately - the roots therefore do not know where to attack
- Protective nonwovens prevent blockages caused by fine particles
- Less seepage loss due to uniform longitudinal distribution in the cover
- Additional mechanical protection
- The water/soil contact area is increased a thousandfold by the water distribution in the protective nonwoven, significantly better water distribution in systems with nonwovens, especially in mixed soil conditions

DISADVANTAGES STIC COMPARED TO STI:

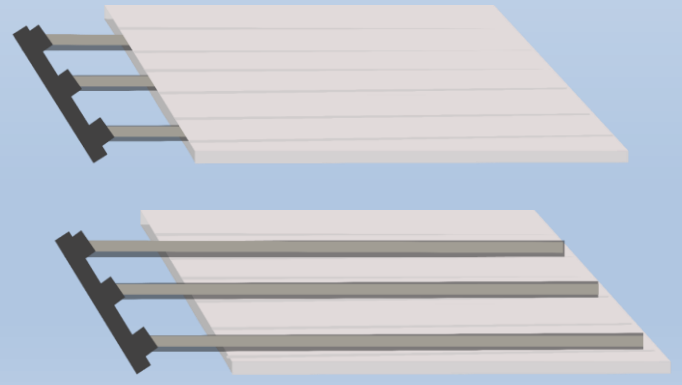
- Higher cost, the weight of the coating can be even greater than that of the tube

6. COMPARISON OF THE DIFFERENT SUBSURFACE SYSTEMS

6b. FULL SURFACE TEXTILE SYSTEMS + (COATED) TUBE

- Full-surface systems in which irrigation tubes are needled between two nonwovens and thus fixed in place have been available in Europe for around 30 years. In some cases, additional water storage elements such as bentonite, vermiculite or zeolite were also inserted between the layers
- In other full-surface variants, the tubes are sewn in between 2 layers of nonwovens or the tubes are laid or fixed on a full-surface distribution nonwoven **with** or **without** a nonwoven coating
- Full-surface systems must be installed relatively precisely at root depth
- The full-surface variants are easy to install for consistently wide base areas with suitable widths e.g. between tram or train tracks *1
- In the event of overwatering, water flows downwards uselessly with the full-surface variant, as the roots cannot reach it
- On slopes, the full-surface version can quickly create a sliding layer on which the soil slips on the wet fleece

© Photo courtesy of Hunter Industries Incorporatedr



Full nonwoven mats + linear installed drippers

* 1 tram tracks

6. COMPARISON OF THE DIFFERENT SUBSURFACE SYSTEMS

6c. NET-SHAPED TEXTILES + COATED DRIP IRRIGATION TUBE

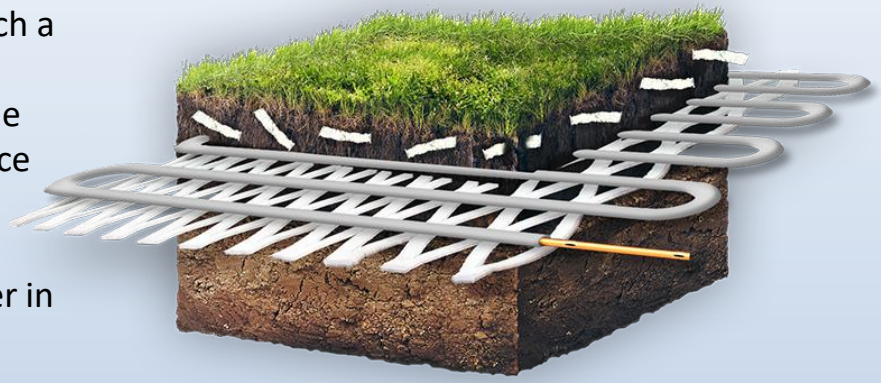
Newer and more cost effective system: partial-surface variant in which a nonwoven-protected irrigation tubes is laid on a nonwoven net. The water-distributing nonwoven net only occupies approx. 25-35% of the total area, resulting in significant changes compared to full-surface variants:

- No barrier effect, the roots can easily grow through the mesh layer in the gaps and dock onto the thick nonwoven mesh all around
  ➞100% of the capillary water stored in the mesh is available to plants, including that on the underside of the nonwoven

- The installation depth of the root-penetrating net is much more flexible and suitable for plant mixtures with different root lengths. The net itself is very flexible and can even be wrapped around root balls of trees *1

- The full-surface variants are easy to install for consistently wide base areas with suitable widths. However, the net variant has clear advantages for small or somewhat more complicated floor areas

- The tubes can be laid parallel or meandering on the water distribution net. Tube spacing approx. 50 - 60 cm



*1 Tree net

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6. COMPARISON OF THE DIFFERENT SUBSURFACE SYSTEMS *

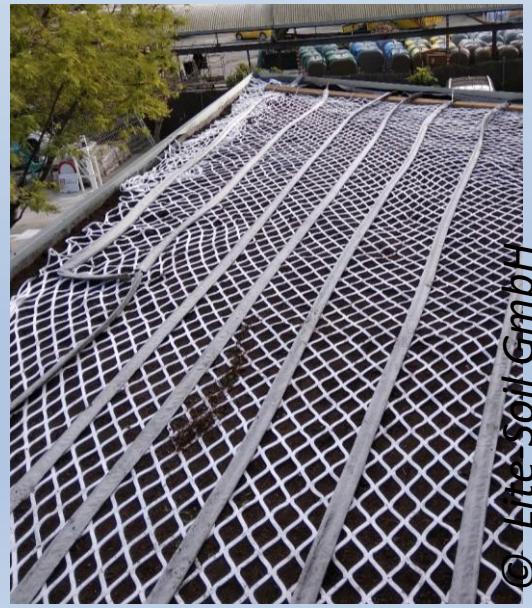
6c. NET-SHAPED TEXTILES + COATED DRIP IRRIGATION TUBE

- Full-surface variants “bounce” slightly under load. The net version does not, as the load is transferred downwards via the spaces between the nets. This means, for example, that the water stored in the nonwoven on a soccer pitch is partially squeezed out downwards when a player runs over it in the full-surface version, but not in the net version

- Even in the event of overwatering, water drains away uselessly downwards with the full-surface variant, as the roots cannot reach it, whereas this is not the case with the net variant

- On slopes, the full-surface version quickly creates a sliding layer where the soil slides on the wet nonwoven. The net variant interlocks with both the soil and the roots and can therefore be installed on much steeper slopes. In addition, the meander effect means that on a slope the water is held much better in the net variant

Slopes Golf course



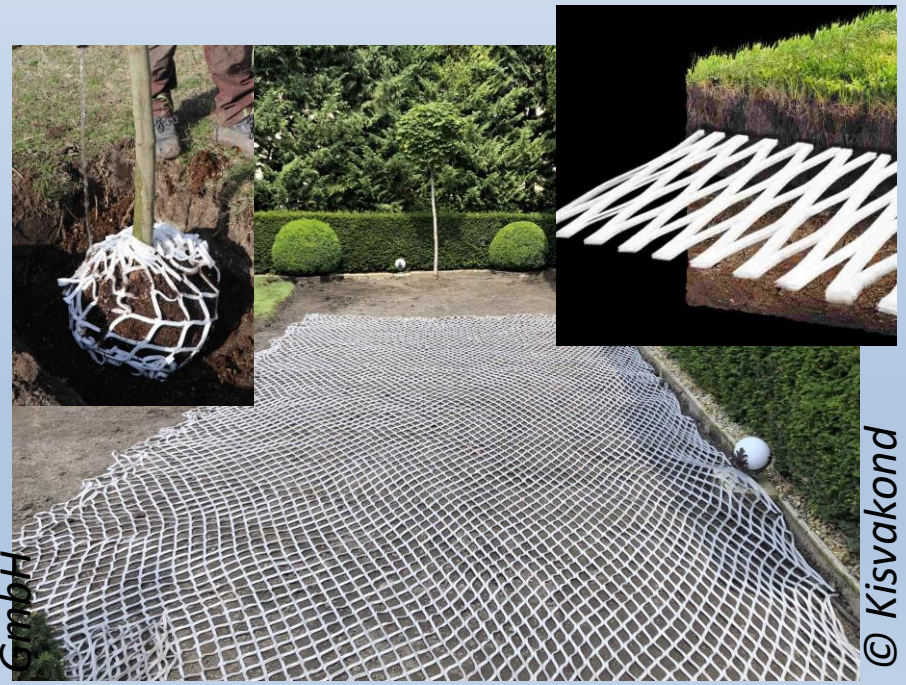
Net shaped

7. SUBSURFACE TEXTILE WATER STORAGE STRIPS & DISTRIBUTION NET

- Elongated nonwoven water **storage strips** installed in the substrate at root level (0.5 – 1 l/m²) to improve the substrate, loosen compacted soil, aerate + support initial growth
- Water storage capacity is significantly increased. The plants can access all the water stored in the nonwoven very easily and effectively when required. 1 kg stores up to 10 l of water

- Subsurface nonwoven water **distribution net** with a high water and air-conducting supply to the plant roots, similar to a network of veins
- The flexible and easy-to-install net can be used close to the roots and efficiently at any level, as roots can easily grow through the open net structure and dock all around
- Biodegradable or durable versions

Subsurface textile water



Subsurface textile storage &

THANK YOU FOR YOUR ATTENTION!

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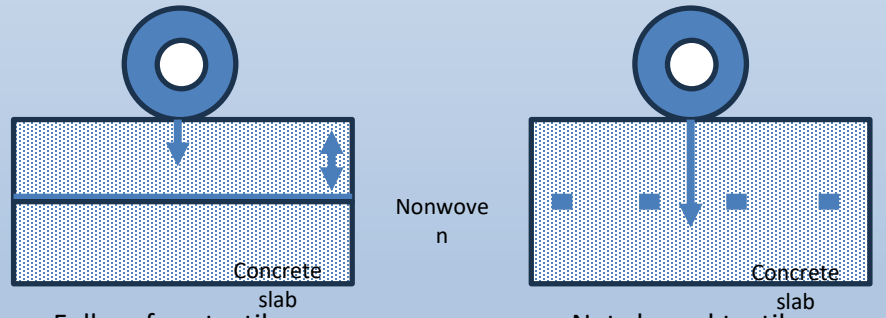
APPENDIX 6. *

6. COMPARISON OF THE DIFFERENT SUBSURFACE SYSTEMS

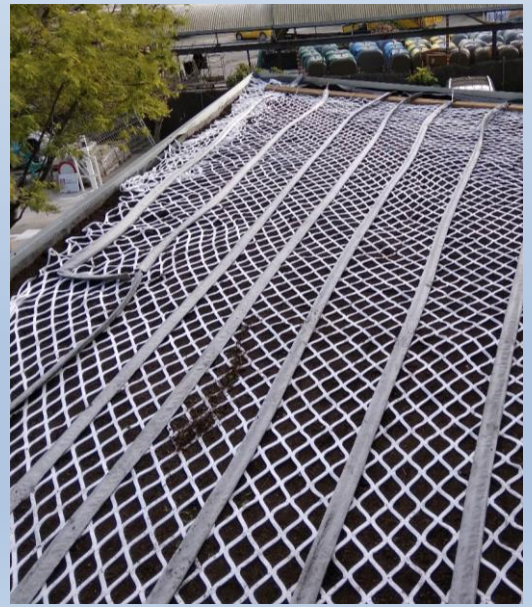
BOUNCING AND SQUEEZING

- Full-surface variants “bounce” slightly under load. The net version does not, as the load is transferred downwards via the spaces between the nets. This means, for example, that the water stored in the nonwoven on a soccer pitch is partially squeezed out downwards when a player runs over it in the full-surface version, but not in the mesh version
- The spaces between the net veins are approx. 60 - 70% of the surface area. As there is soil there and this can withstand far more pressure than the nonwoven, practically 100% of the load is transferred downwards there
- This effect can be understood more clearly if you imagine a layer of concrete instead of soil, with a 6 mm thick nonwoven in between, for example:



Full-surface textiles:
Ballast compresses the nonwoven
Water is squeezed out downwards

Net shaped textiles:
Load is transferred via the gaps
Water is not squeezed out

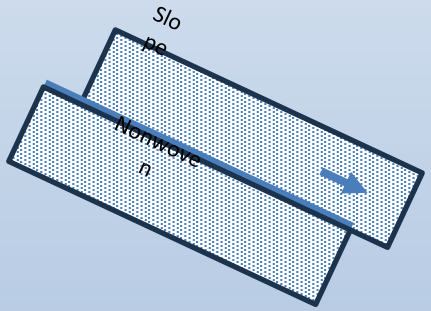


Net shaped textiles

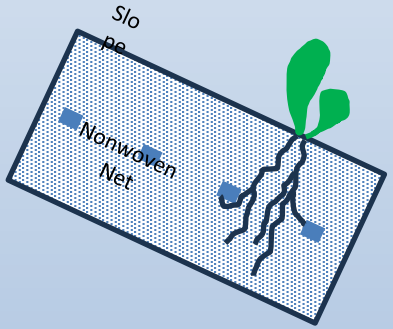
6. COMPARISON OF THE DIFFERENT SUBSURFACE SYSTEMS

SLOPE SLIDING

- On slopes, the full-surface version quickly creates a sliding layer where the soil slides on the wet nonwoven. The mesh variant interlocks with both the soil and the roots and can therefore be installed on much steeper slopes
- In addition, if the soil does not have a good grain size distribution, a layer of fine particles can build up on the top of the nonwoven in the full-surface variant. This leads to even faster sliding
- The meander effect means that on a slope the water is held much better in the net variant, as the water cannot run off in a fall line

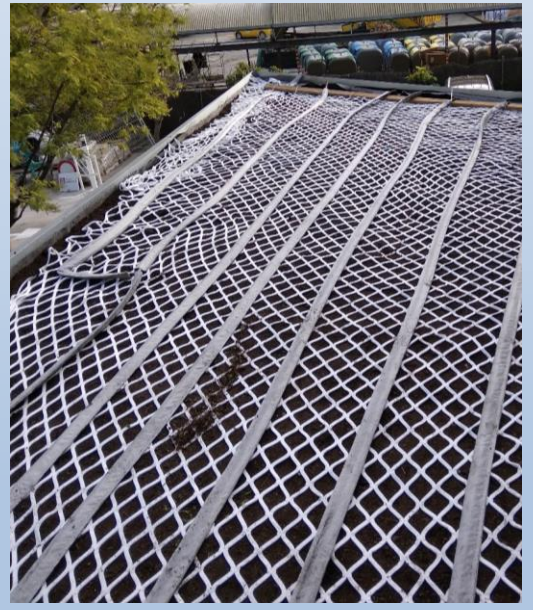


<u>Full-surface textiles</u>:
With a full-surface sliding area
Especially for a fine part coating



<u>Net shaped textiles</u>:
The soil above and below the nonwoven are connected
Plant roots further improve this connection
No layer of fine particles can form

Easier to attach, can also be used on steep slopes



Net shaped textiles