

Next generation precision irrigation for berries

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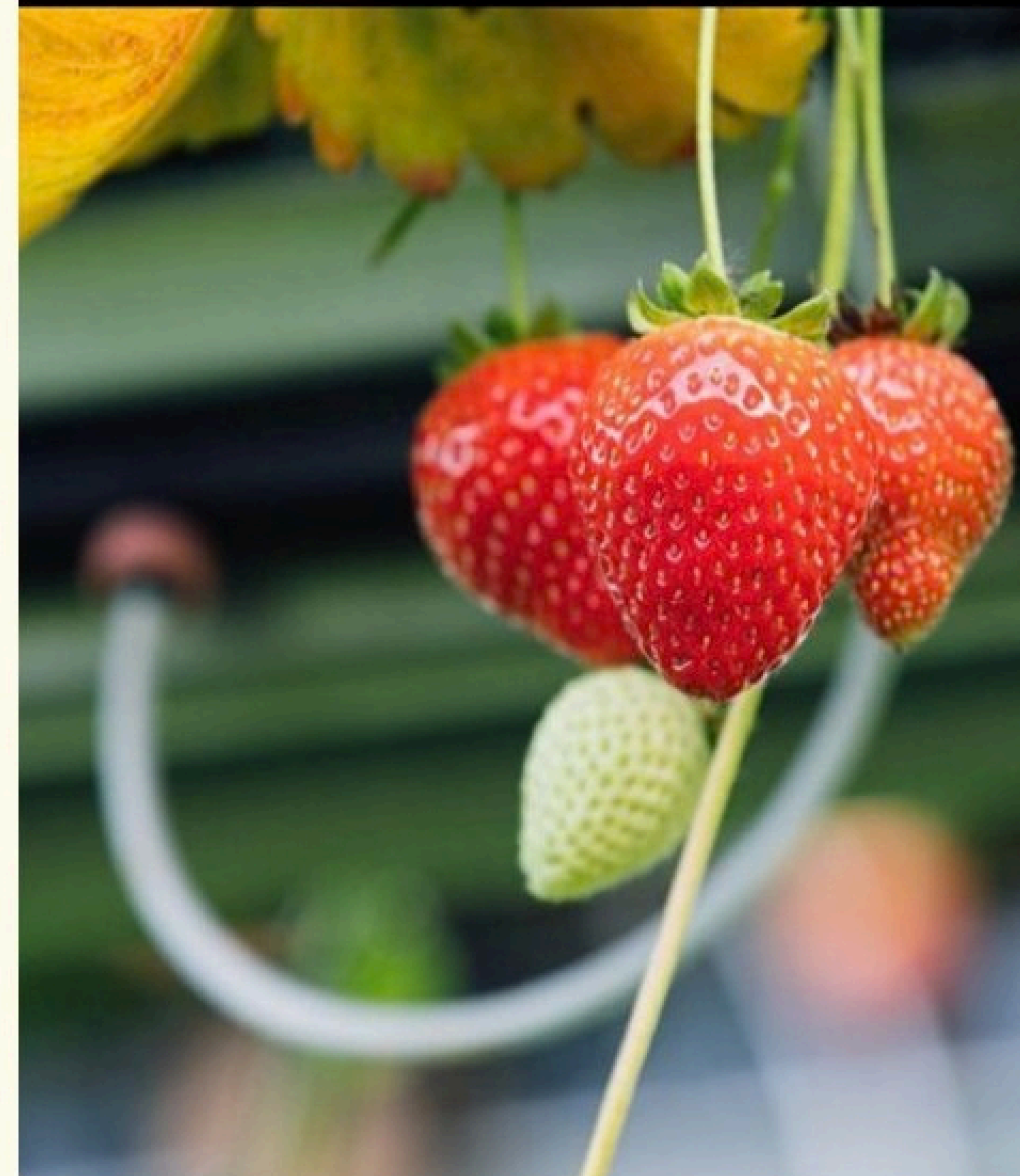
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Content

- What does optimal irrigation in substrates look like?
- What are the factors affecting pot-pot uniformity and in-pot uniformity?
- New irrigation options for Strawberries
- New irrigation options for Blueberries & Rubus
- Q & A



What does optimal irrigation look like across a block?

- Uniformity is the key
- It starts with the design
- All drippers start at the same time- i.e., no leaks
- All drippers stop at the same time- i.e., no line drainage



What does optimal irrigation look like across a block?

- Maintenance enables Uniformity
- Have an inspection and maintenance schedule
 - System Pressures
 - Filters
 - Emitters
- Know your travel times for fertilisers and peroxide/ chlorine



What does optimal irrigation look like inside a pot?



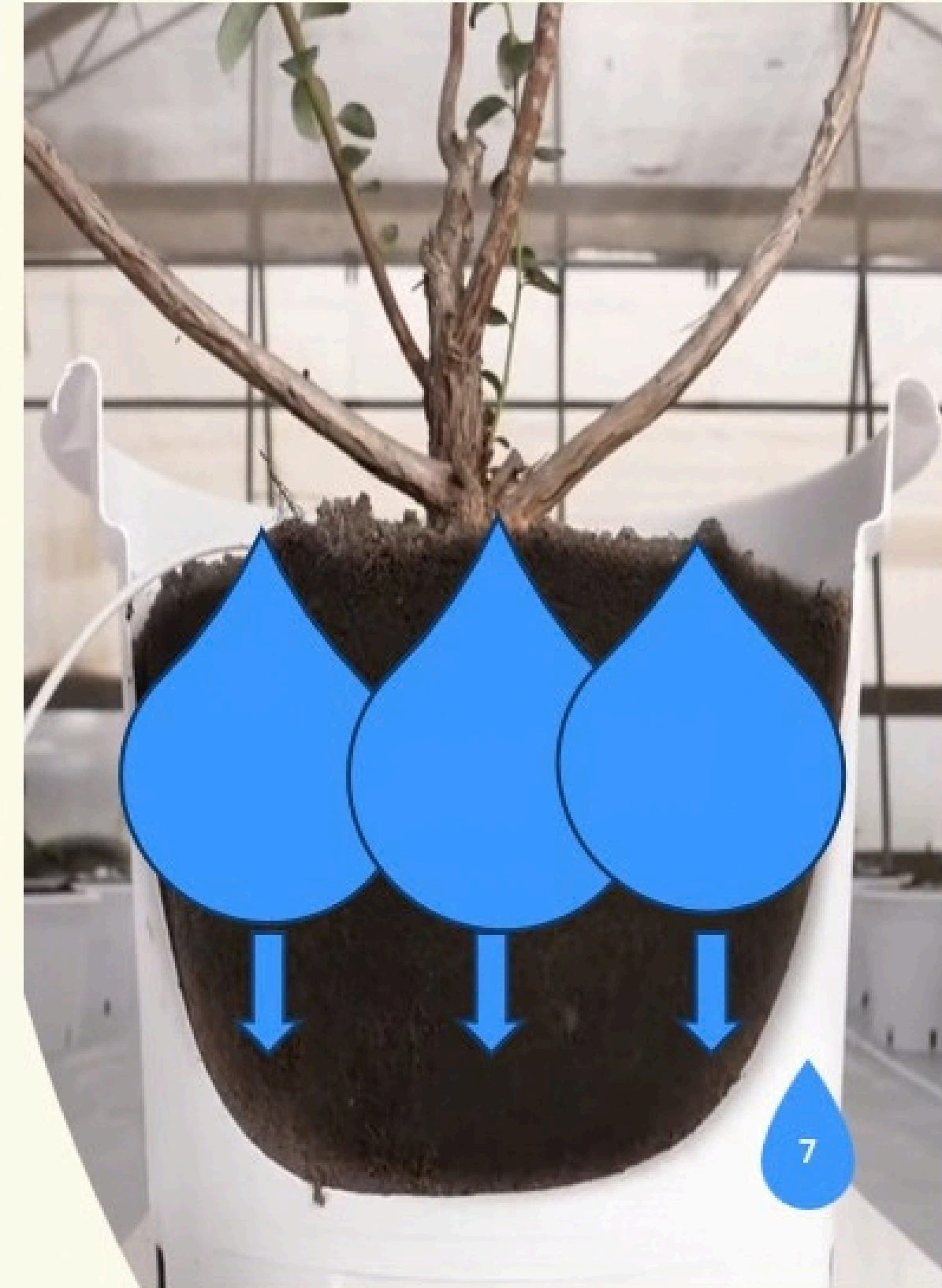
What does optimal irrigation look like inside a pot?

- Moisture levels are constantly maintained at near optimal levels
- Moisture is distributed evenly throughout the pot
- Saturation is avoided
- Dry zones or high EC zones in the soil are avoided
- Nutrient levels (EC) is distributed evenly throughout the pot
- Drainage volumes are only sufficient to rebalance EC and to flush out accumulated Na, CL



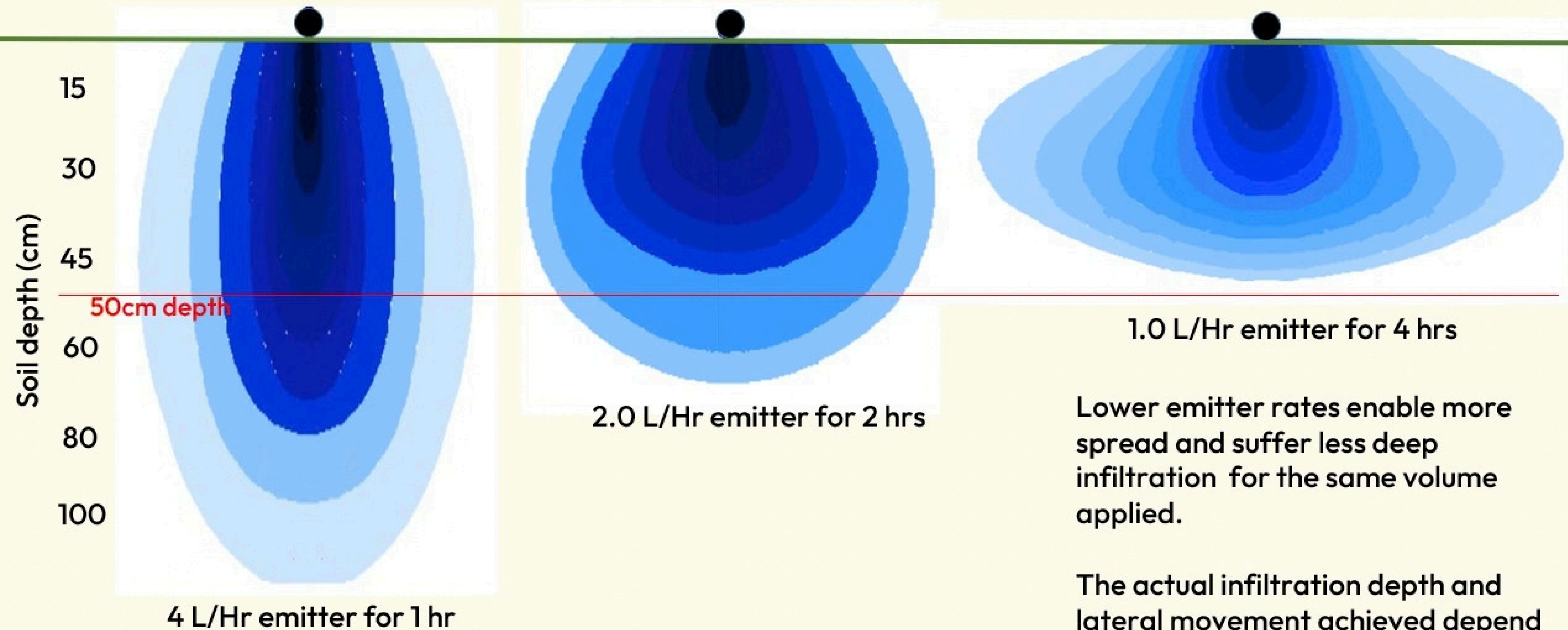
Factors affecting in-pot moisture and nutrient distribution

- Outlets per pots and location?
- 2...3....4....more??
- Outlet depth- shallower is better



The effect of emitter flow rates on wetted bulb shapes in soil

(Each emitter has applied the same volume of water)

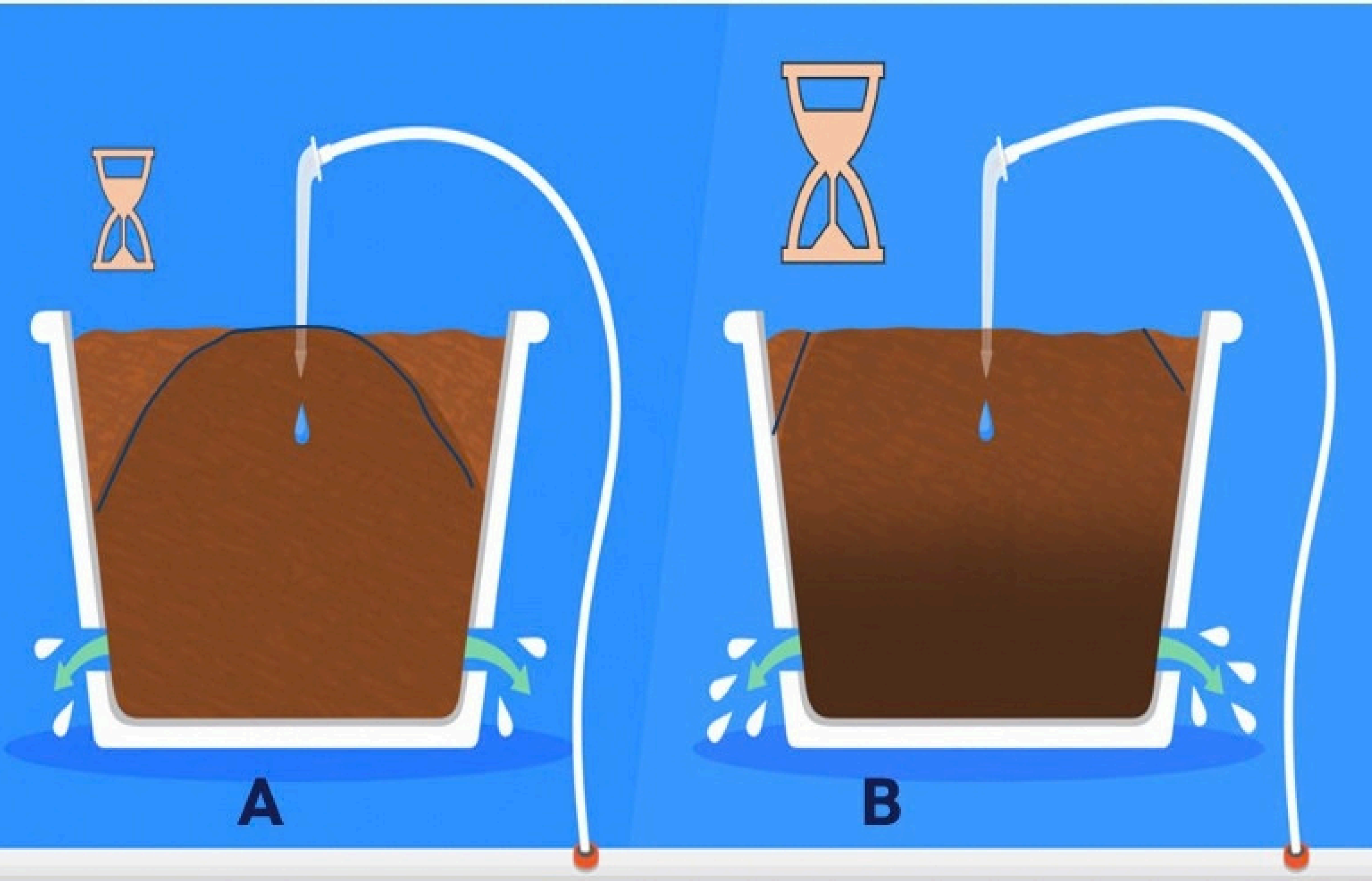


Lower emitter rates enable more spread and suffer less deep infiltration for the same volume applied.

The actual infiltration depth and lateral movement achieved depend on the soil's characteristics.

Irrigation duration?

Comparing irrigation durations and volumes:



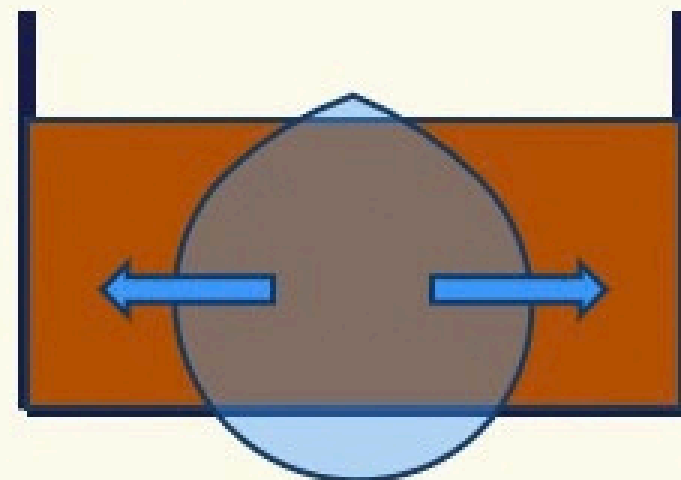
A: 3 x 2L/hr drippers for 3 minutes
= 300 mL

B: 3 x 1.2 L/hr dripper for 5 minutes
= 300 mL

**Sames volumes applied, but
different moisture distributions**

Factors affecting in-pot moisture and nutrient distribution

- Substrate type and/ or blend
- Pot/ bag shape & depth
 - Wide and/or shallow containers need slower irrigation to give the applied water sufficient time to spread more before drainage occurs
 - If irrigation is applied too fast, then point saturation leads to rapid downward channelling of the water

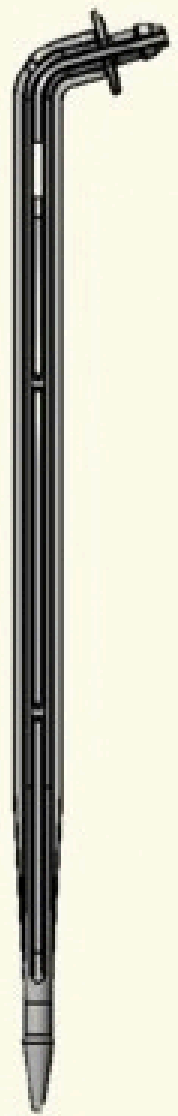


Terminology

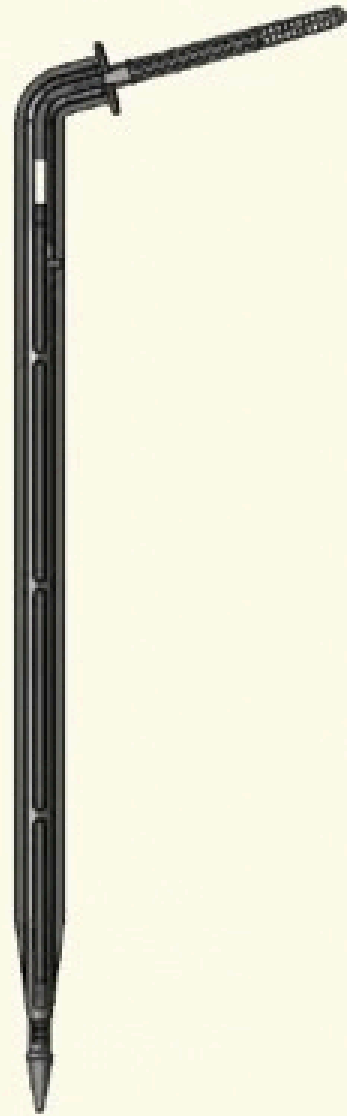
Inline v Online drippers/emitters

CNL= Controlled Non-Leakage

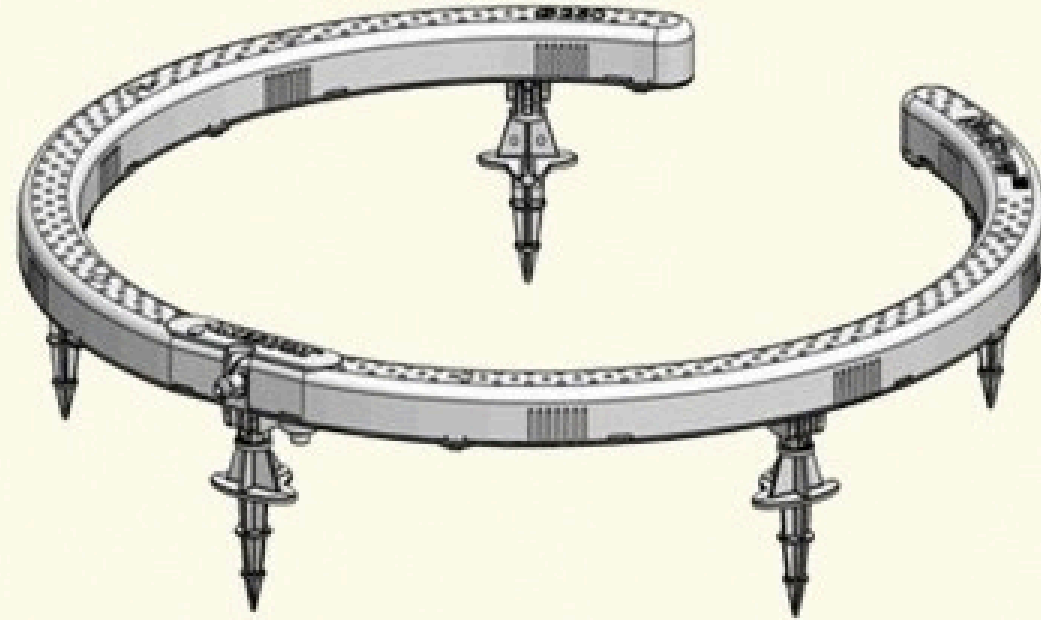
HCNL = High Controlled Non-Leakage



Tube Spike



Arrow Dripper



NetBow

Outlets

Online Emitters

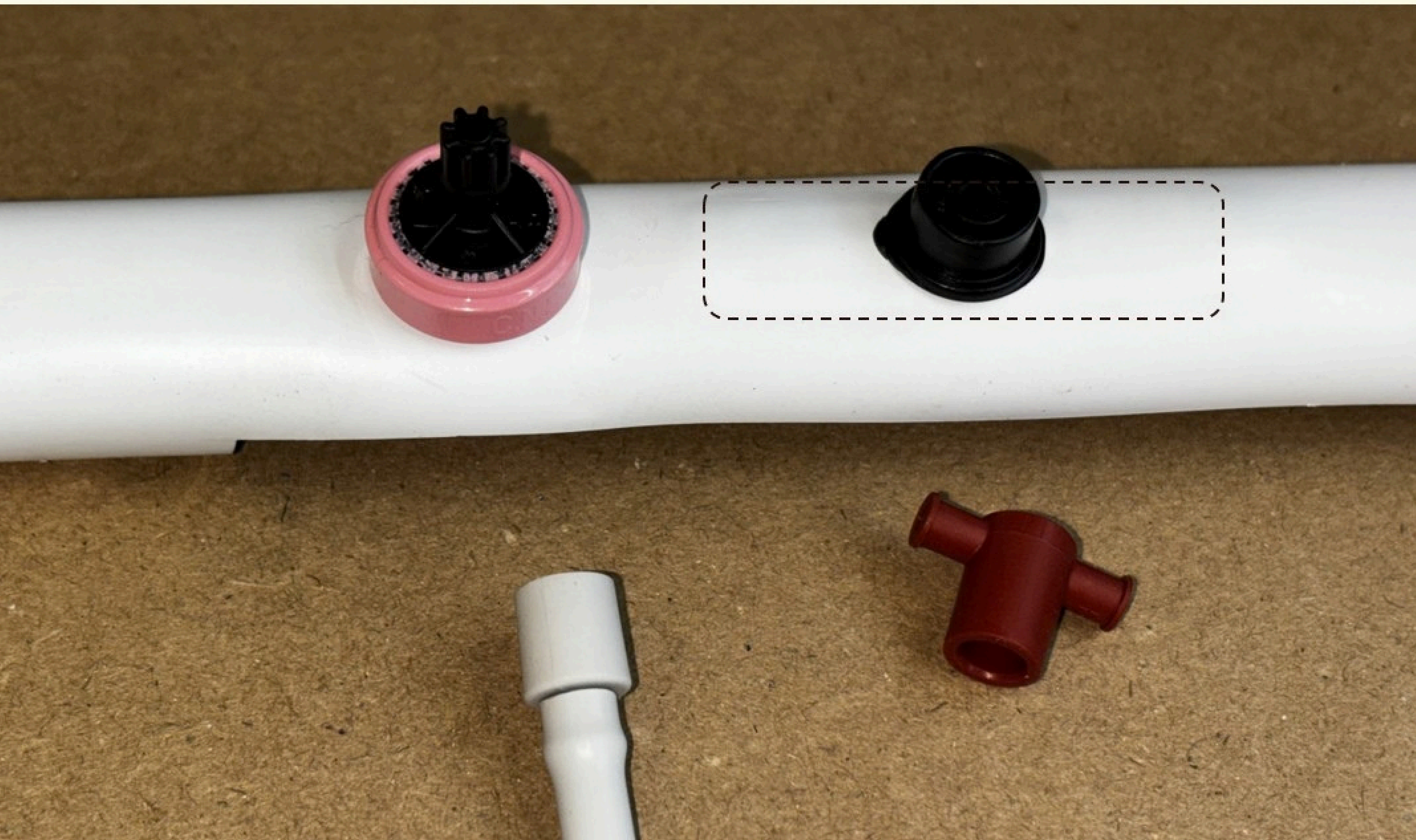


PCJ Drippers

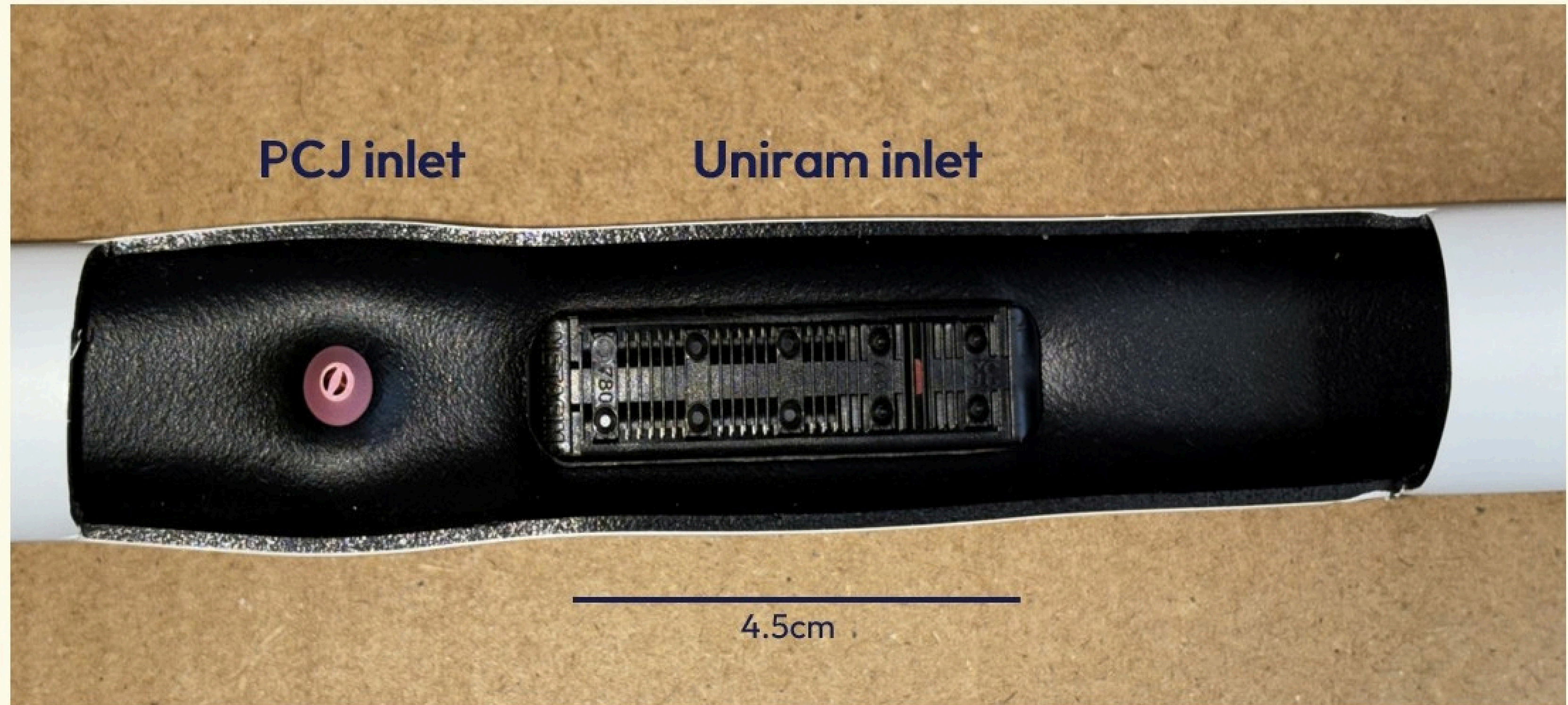


PC Dripper

Online vs. inline emitters



Online vs. inline emitters

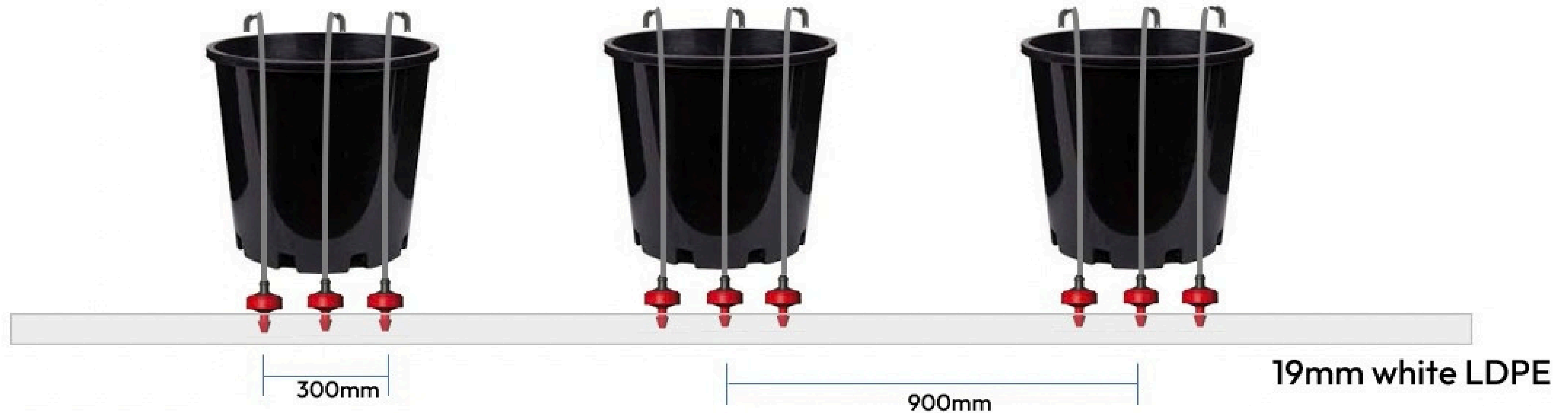


New inline emitters and accessories for substrate berries

- **PCJs + tube spikes**
- **PCJ PRO + tube spikes**
- **Uniwhite Dripline for Strawberries**
- **Uniram Hybrid dripline + tube spikes**
- **Uniram hybrid dripline + Netbows**
- **Uniram hybrid dripline directly on pots**

PCJs + tube spikes

(The status quo)



Pros & Cons:

- Flexibility and redundancy of using 3 emitters/ outlets
- Considerable spaghetti
- High labour installation/ maintenance costs
- Poor flushing of online emitters= shorter life
- Only has 1.8m hold back
- Cheapest option

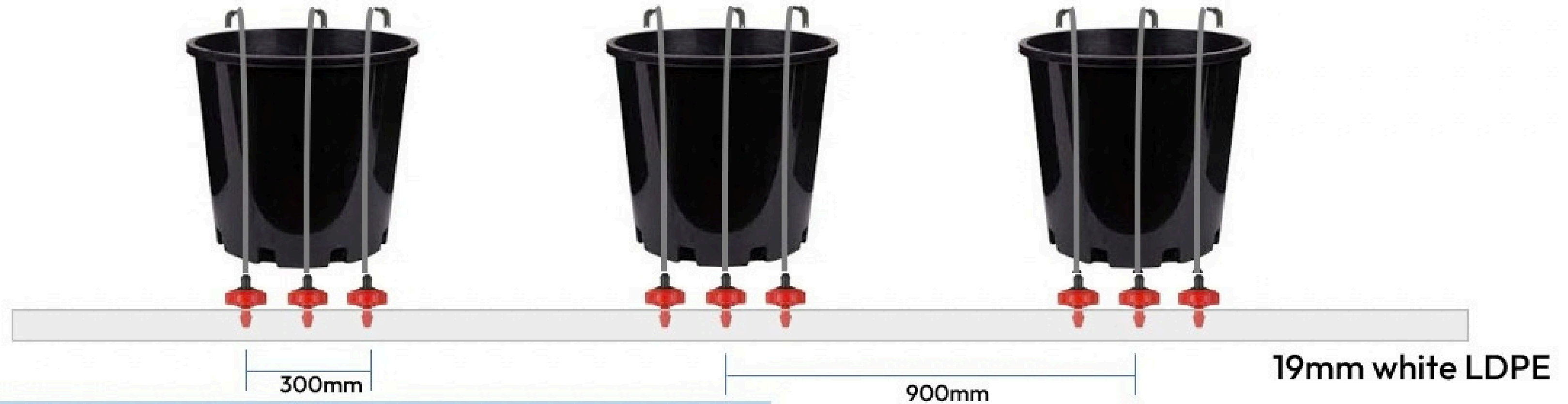
Benchmark pricing



Lateral pipe	Emitter	CNL Hold Back	Distribution	Flow Rate per Pot
19mm LDPE	3x PCJ HCNL 2.0 L/hr	HCNL 1.8 m	Tube Spikes 3	6.0 l/hr

PCJ PROs + tube spikes

Improved HCNL performance in an online dripper



Pros & Cons:

- Improved 2.5m hold back
- Flexibility and redundancy of using 3 emitters/ outlets
- Considerable spaghetti
- High labour installation/ maintenance costs
- Poor flushing of online emitters= shorter life
- 2nd Cheapest option

PCJ
PRO



Straight barb
3 mm

Lateral	Emitter	CNL Hold Back	Distribution	Flow Rate per Pot
19mm LDPE	3x PCJ PRO HCNL 2.0 L/hr	HCNL 2.5 m	Tube Spikes 3	6.0 l/hr



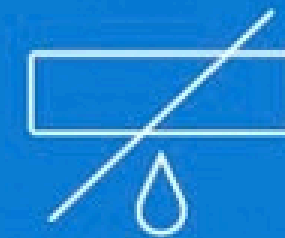
UniWhite™ CNL & HCNL

Integral pressure-compensated, continuously self-flushing, anti-siphon and anti-drain mechanism dripper, ideal for greenhouses and permanent applications that require intensive irrigation scheduling. Dripline colored white for minimal solar radiation absorption.

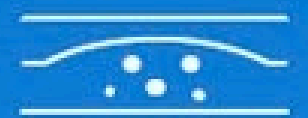
→ 16010 - 16012 - 20010 - 20012



Pressure-compensated



Anti-drain mechanism



Self-flushing mechanism

Netafim Recommends: 1.25L/hr emitters at 15cm spacing



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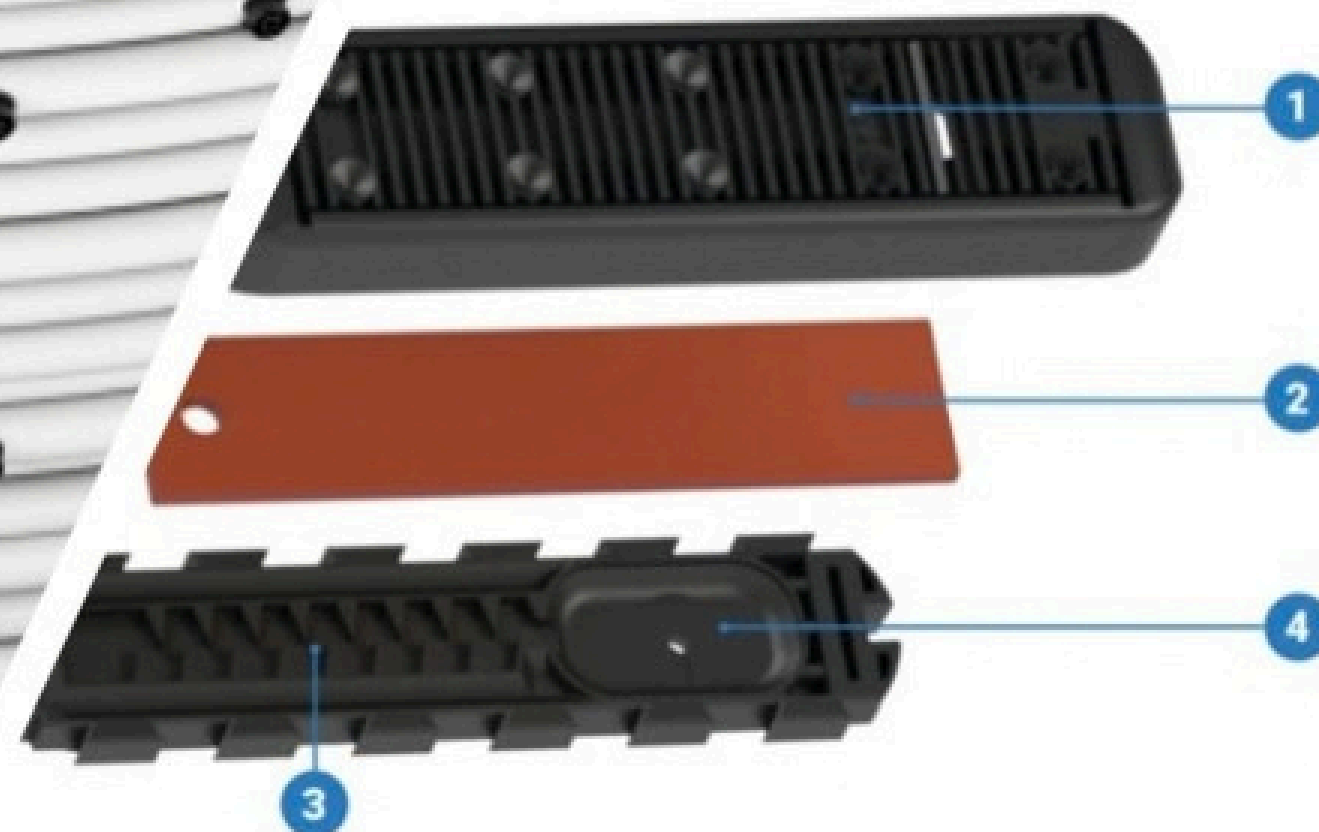
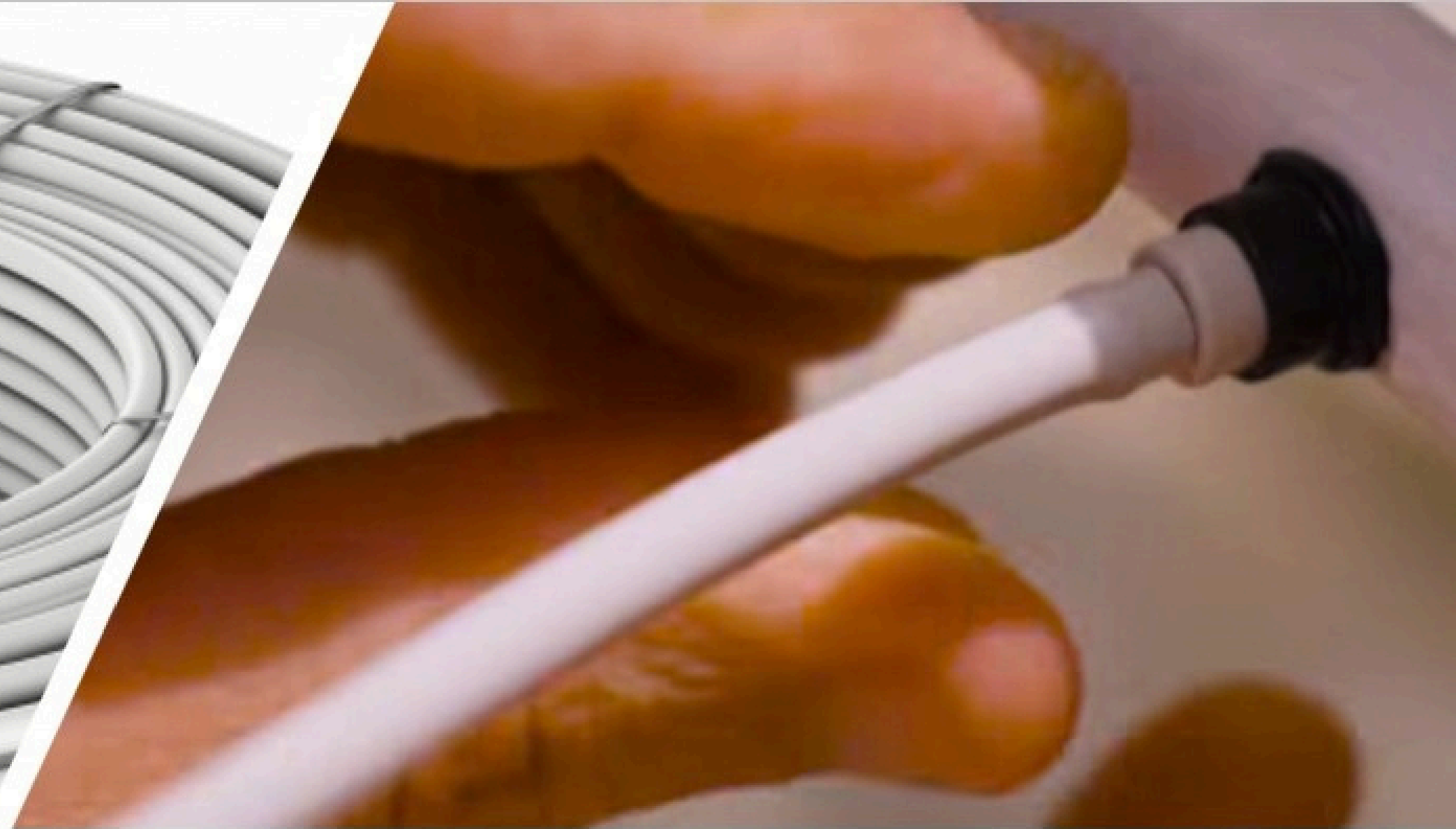
Anthony Yewers - Berry Sweet

/ Benefits & Features of Inline dripline

- Pressure-compensated
Precise and equal amounts of water delivered over a broad pressure range, ensuring 100% uniformity of water and nutrient distribution along the laterals.
- Anti-siphon mechanism
Prevents contaminants from being drawn into the dripper, making it ideal for sub surface applications.
- Anti-drain mechanism (CNL & HCNL)
Eliminates drainage and refill effect, and improves efficiency in pulse irrigation even in steep topography .
- Continuously self-flushing
Flushes debris throughout operation, while ensuring constant dripper operation even in challenging water quality.
- Physical root barrier
Better protection against root intrusion, utilizing unique dripper design that creates physical barriers protecting the dripper from root growth into its labyrinth.
- Wide filtration area
Ensures optimal performance even under harsh water conditions, preventing the entrance of sediment into the labyrinths.
- Wide water passages
TurboNet™ labyrinth ensures wide water passages, large deep and wide cross-section that improves clogging resistance. The water is drawn into the dripper from the stream center, preventing the entrance of sediments into the drippers.
- White color coded
The white color on the outer surface makes it absorbs less energy and takes advantage of the radiation inside the greenhouse.

Over pot driplines





1 Filtration Area

Its largest industry-leading filtration area maximises the lifetime of the dripper by preventing the entry of particles into the dripper flow path to increase **durability** even under the **harshest water conditions**.

2 Diaphragm

Made of chemical-resistant silicone, it is vital to UniRam™'s **pressure compensating** and **self-cleaning** capabilities.

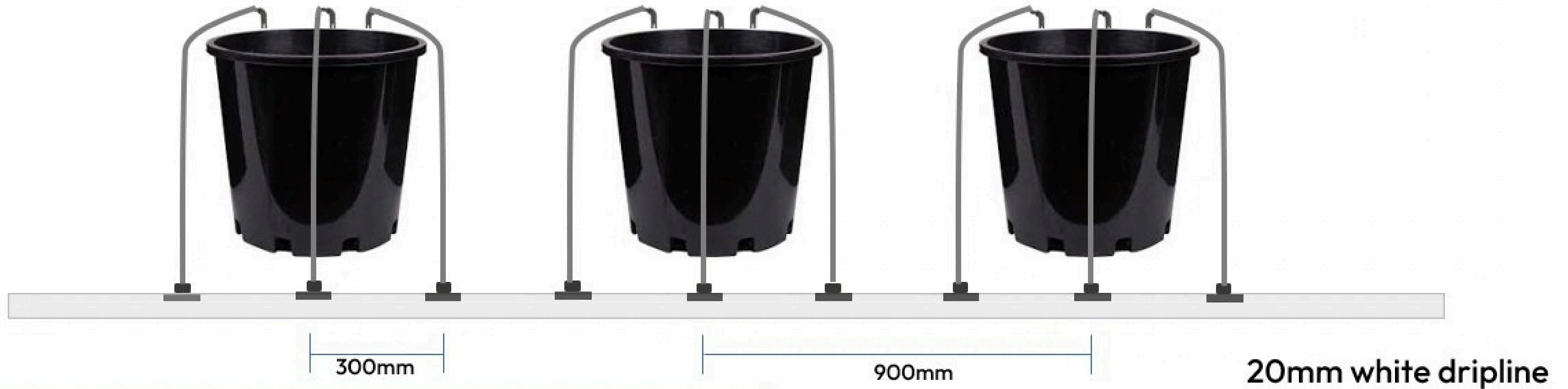
3 TurboNet™ Labyrinth

The patented double flow path is designed with a large deep and wide cross-section as well as razor sharp teeth to **maximise turbulence** and **prevent clogging**.



Uniram Hybrid dripline + 3 tube spikes.

Improved emitter flushing, longevity and HCNL performance



Pros & Cons:

- Proven Uniram emitters = robust/ long lived.
- Emitters factory fitted = Less installation labour
- Simple nipple connectors to microtubes
- Improved 2.5m hold back
- Flexibility and redundancy of using 3 emitters/ outlets
- Emitters inside dripline= better flushing and maintenance

Lateral	Emitter	CNL Hold Back	Distribution	Flow Rate per Pot
Uniram 20012	3x PC HCNL 2.0 L/hr	HCNL 2.5 m	Tube Spike x3	6.0 l/hr

2 lines of Uniram Hybrid dripline directly over the pots. Simplicity and low installation effort



Pros & Cons:

- Simplest installation & easiest maintenance
- Proven Uniram emitters = robust/ long lived
- Nipples ensure droplets fall off pipe
- HCNL 2.5m hold back
- 4 outlets per pot = better distribution
- Driplines must be tensioned

Lateral	Emitter	CNL Hold Back	Distribution	Flow Rate per Pot
Uniram 2012	4x HCNL 1.25 L/hr	HCNL 2.5 m	4x nipples	5.0 L/hr

[< Previous](#)



25 Liter Round Pot with U-Grooves

Product #1308026

IDEAL FOR SUBSTRATE PRODUCTION

- Long Legs (30mm/1.18")
- Excellent Drainage & Root Ventilation
- Unique Stacking Design
- Dimensions: 385mm wide x 354mm tall

[Download Tech Sheet](#)

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Driplines must be tensioned to stop snaking and to hold the emitters in position



Examples of dripline irrigation directly over pots



Substrate Ginger



Uniram Hybrid with 1 Netbow

The ultimate in improved longevity, HCNL performance, moisture distribution and less drainage required



Pros & Cons:

- Proven Uniram emitters = robust/ long lived.
- Emitters factory fitted = Less installation labour
- Simple nipple connectors to microtubes
- Improved 2.5 m holdback
- Netbows have 8 outlets= best distribution
- Highest productivity

Lateral	Emitter	CNL Hold Back	Distribution	Flow Rate per Pot
Uniram 20012	1x PC HCNL 4.4l/hr	HCNL 2.5 m	Netbow 250mm	4.4 l/hr

Use of Technologies and Methods of Irrigation of Blueberries in Soils and Substrates

David Bryla

*U.S. Department of Agriculture
Agricultural Research Service*

Collaborators: Scott Orr, Camilo Souto, and Cora Boba-Schisler

Root Growth results from plants 18 months old. Netbows grew the most Roots.



Standard irrigation frequency

Hybrid + Netbow installation



Hybrid + Netbows = Clean and simple



4-way spiders = Complex and messy



 **Anthony Yewers - Berry Sweet**

Emitter Conclusions

- More outlets = better moisture distribution in pot
- Better moisture distribution = better root growth
- Better roots = faster establishment = faster ROI \$\$\$
- Lower emitter flow rate = better distribution
- Lower emitter flow rate = less drainage required
- Inline emitters offers many advantages over online emitters

Q&A



Thank you

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