IPPS Southern African region

Substrates can optimise the quantity of water used

Port Elizabeth

7th of March 2018

Jean Roudier

1913

we make it grow

Substrates can optimize the quantity of water used

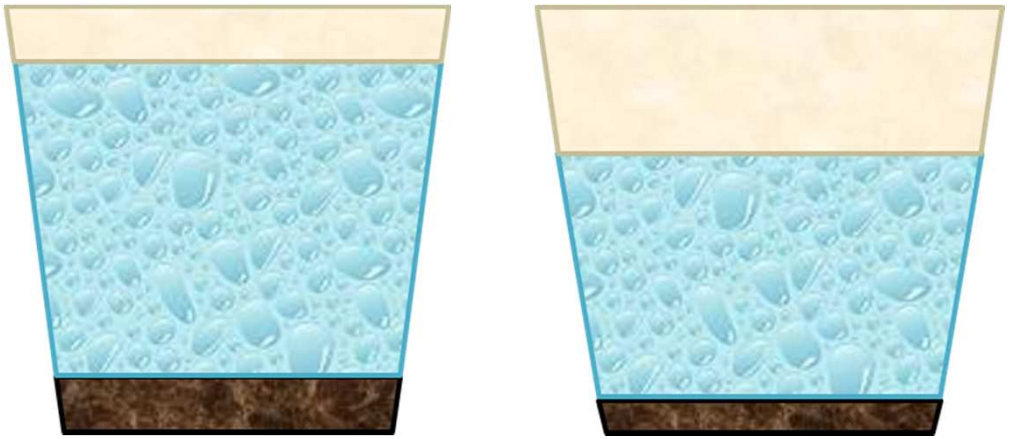
Think outside the box ?

Think inside the pot!

Substrates can optimize the quantity of water used

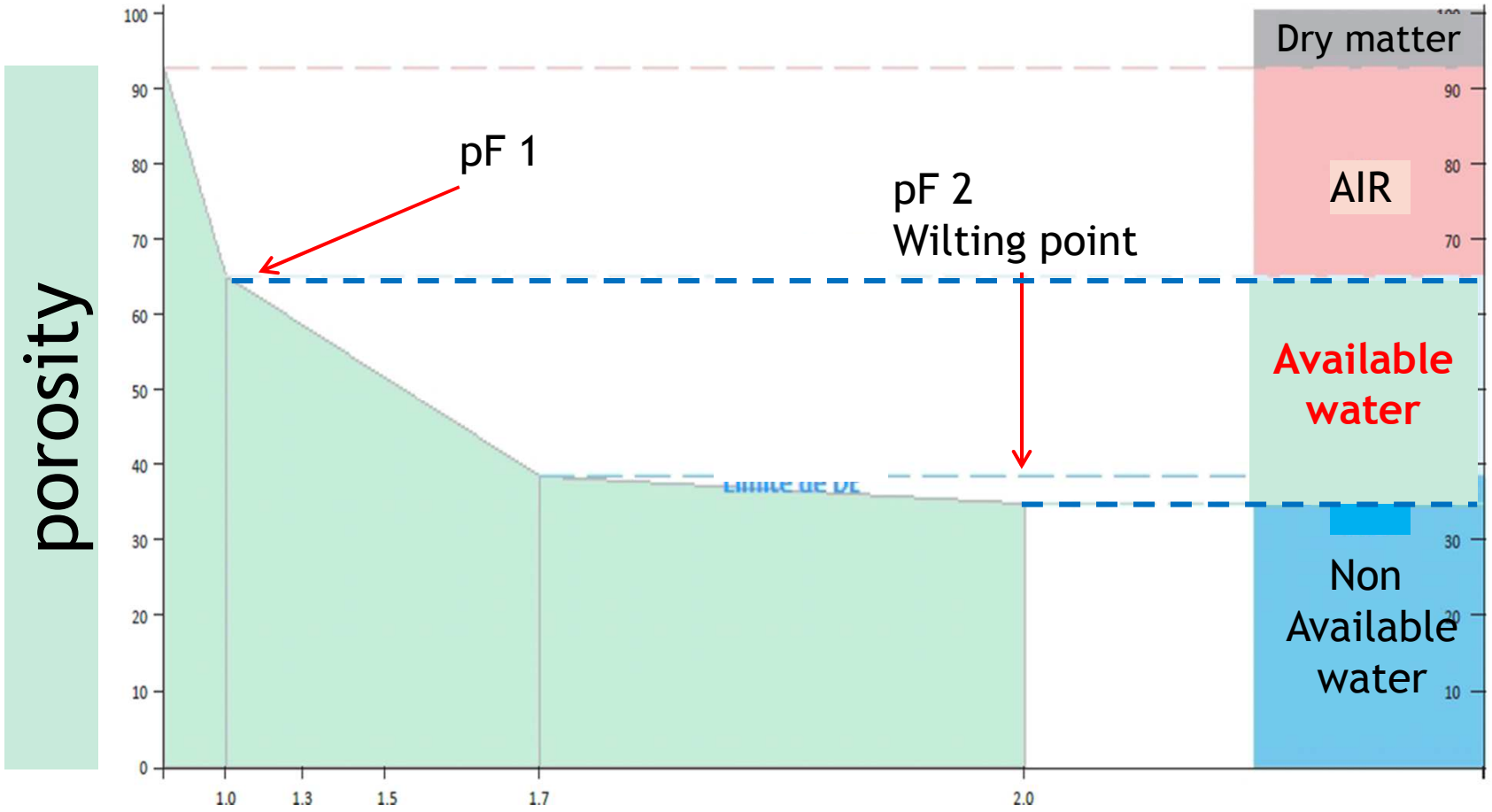
A growing media is a tank of air and water

Porosity filled with air and water



Substrates can optimize the quantity of water used

What is hapening in a growing media ?



Substrates can optimize the quantity of water used

Inside a pot ?

Dry matter – solid part of the growing media

Porosity : size of the tank

Air (filled porosity) AFP, at pF 1

Water (holding capacity) WHC

water available to the roots from pF 1 to pF 2

“non” available above pF2

Substrates can optimize the quantity of water used

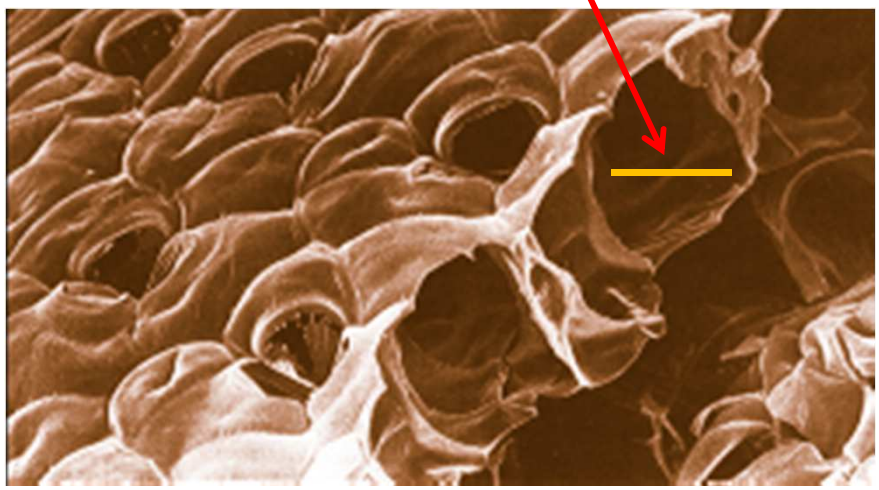
Quantity of available water varies with the raw material

Lot of available water

Limited available water

Substrates can optimize the quantity of water used

3 kinds of raw material



Micro structure of sphagnum white peat

1. Lot of available water

High porosity - water
sphagnum peat,
milled peat,
peat extracted from sods, fine grade

lot of available water,
30 to 40% of the total volume
in some cases limited air and drainage

watering less often
limited drainage, limited losses
less stress
Water more “efficient”

Substrates can optimize the quantity of water used

3 kinds of raw material

2. Lot of air, limited available water

High porosity - air
coir, coco pith,
bark,
wood chips, wood fibres
Coarse peat, peat fibres
Perlite

15 to 20% of the total volume

lots of air and drainage (if no fine particles)
limited water capacity
watering often, limited amount of water,
drainage
stress

3. Limited porosity

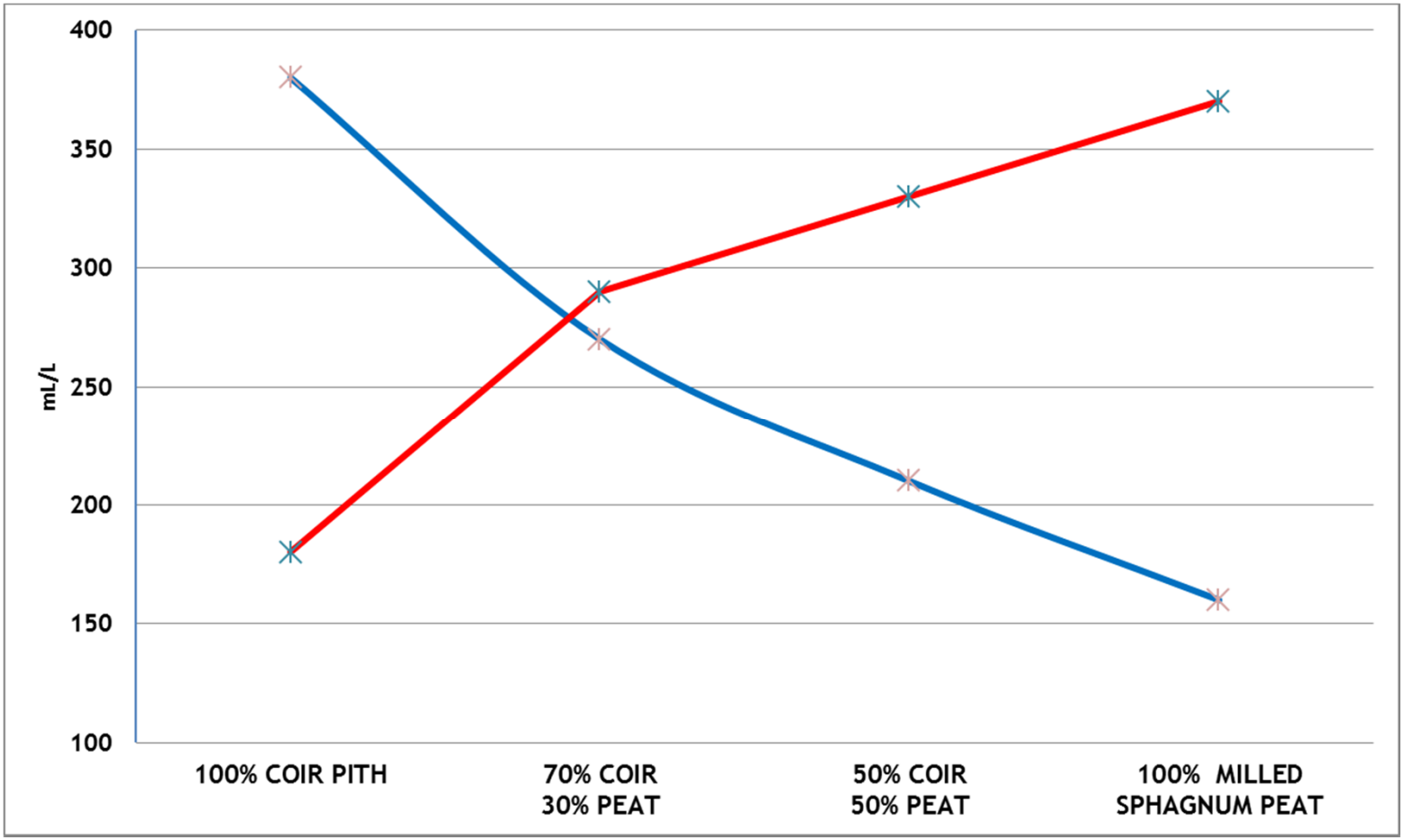
Reducing the size of the pots
Reduced air and water capacities

Sand
Gravels
Ground soil

Very limited
amount of available water
And air

Substrates can optimize the quantity of water used

Increasing available water quantity ?



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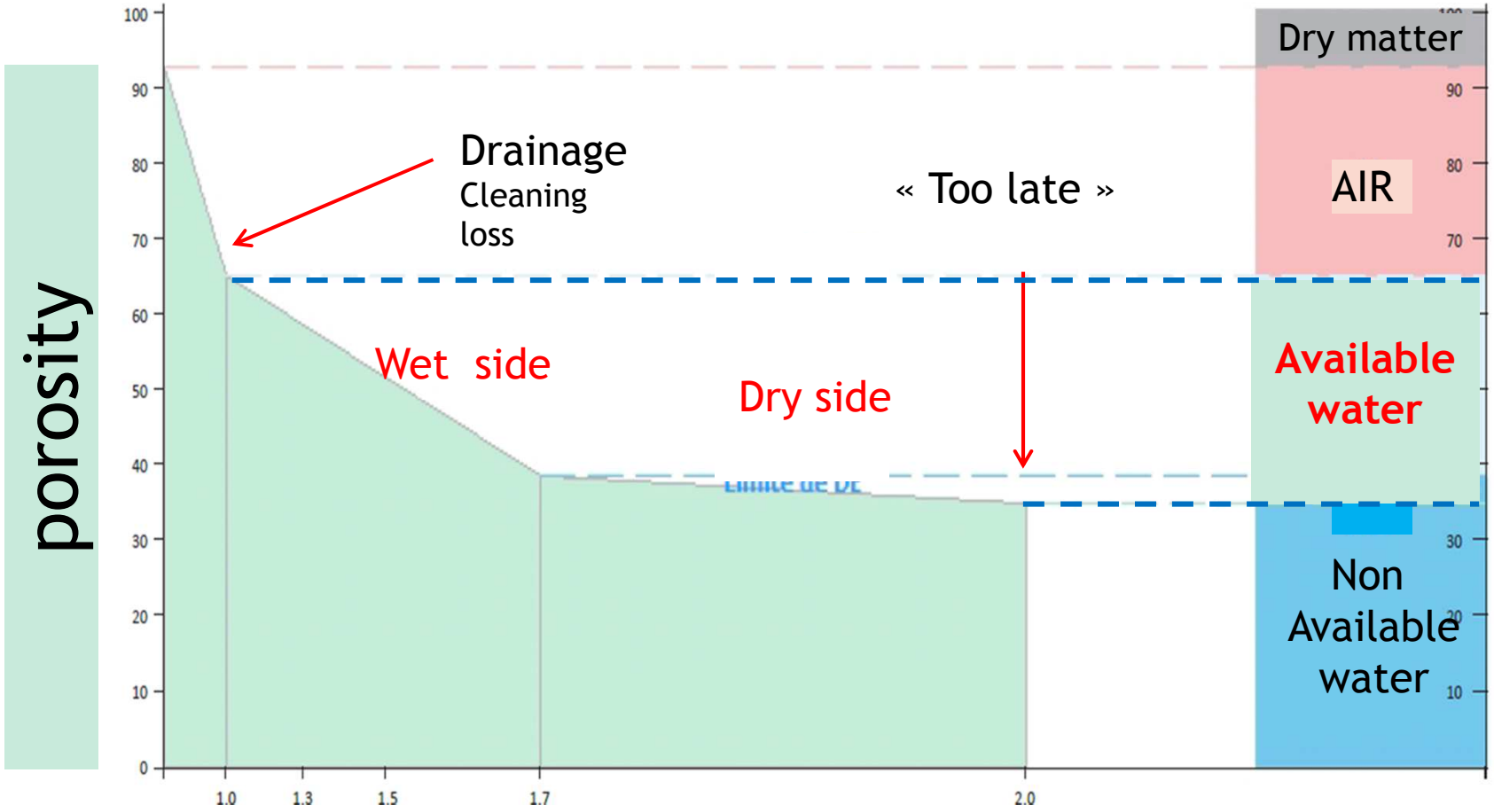
Substrates can optimize the quantity of water used

Giving water, When ? How much ?



Substrates can optimize the quantity of water used

Influence of irrigation to save water ?

Local irrigation, close to the roots

Drip irrigation in pots

Make sure pots can be fully wet

top to bottom

all around the pot

Peat fibers

Rewetting, avoid hydrophobic conditions

Couple growing media - watering

Substrates can optimize the quantity of water used

Practical experience: Vegetable seedlings

From bark

- to bark coir
- to bark coir peat
- to peat coir

watering less often, less drainage

from 7 to 4-5 week crops

estimated water saving 30 to 50%

- to plain sphagnum peat

estimated water saving over 50%

Substrates can optimize the quantity of water used

Tomato soilless, 11 month crop

From coir slabs to coarse peat slabs

Water EC 1,2 to 1,5, drainage mandatory

Giving 300 ml instead of 100ml, reduced frequency, limited drainage

Estimated water saving 30 %

Could be higher with a better water quality, if lower EC

Reduced fertilizer level,
save nutrients

Substrates can optimize the quantity of water used

Blueberry, grown in 20 to 40 l pots

Standard mix coir perlite up to 60% (70% possible), peat

Peat mix with max “only” 30% alternative for drainage

Growing with 3 drippers instead of 4, same water regime

Saving 25%

Plain coarse peat mix, estimated saving 50%

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Ornamental crops

Your experience ?

- from bark to bark and peat, example of France

	screened bark	70 bark 30 coir	70 bark 30 peat
air pF 1	53,4	50,1	36,7
available water	5,5	8	12,5

- from coir to peat and coir
- from peat and coir to peat
- Water saving up to 50%

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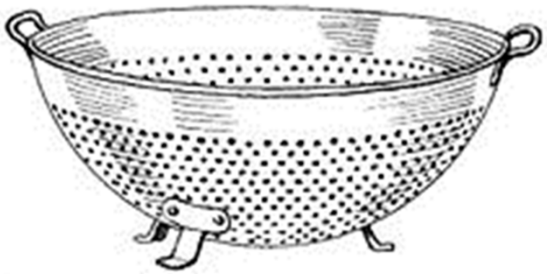
Growing Media



Water management

Saving water ?

Substrates can optimize the quantity of water used

How to make the best use of water?

Growing media has a role to play

Adding some sphagnum peat increases water efficiency:

much more available water

less drainage, less losses

less stress to the plants → less unsold plants

better and faster growth → reduced production cycle

improved shelf life

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