Provender Nurseries

Our journey to Sustainable Growing Media with ICL

Andrew Wilson

Technical Manager, ICL UK & IRL

Stuart Tickner

Nursery, Production and Biosecurity Manager

20th November 2023

Provender Nurseries

- Wholesale Nursery with large Cash & Carry
- Located Swanley, Kent
- Provender is on a 17 acre site employing over 80 staff (Full & P/T)
- Grow over 100,000 plants in pot sizes from 2 Litre to 45 Litre.
- Production is entirely Peat Free
- Supplying plants to Landscape and garden designers
- Many plants are grown for RHS shows such as Chelsea and Hampton Court

Peat Free journey

- In spring 2020, Provender was keen to try Peat Free to improve nursery biosecurity and sustainability, initially looking at Lavender
- Discussed with Local ICL Technical Sales Manager Steve Chapman
- Concerned about peat-free growing from past experiences, particularly with water management and plants drying out.
- Steve was confident and suggested a mix which he had used successfully before, which eased our concerns. The peat free mix contained an ICL nutrient and wetting agent package
- The first trials in May 2020 Lavender and Hakonechloa were very successful and gave us confidence to expand trials to full production
- Provender have been Peat free for the last 3 years
- ICL's growing media package eased concerns over Water management , Nitrogen availability and Nutrition

Addressing the concerns

In Sustainable Growing Media mixes

Water

Nitrogen Compensation

Crop nutrient requirements

Levington Advance Solutions

Considerations when deciding on Provender Peat-Free mix

ICL offered a Total Solution package based on:

- Raw Material Physical / Chemical Properties
- Water – Quality and application
- Nitrogen Compensation
- Nutrition

Sustainable Growing Media

Physical properties

- Water-holding (WH) and Air-Filled Porosity (AFP)
- Balance is essential to achieving a mix suitable for nursery plants
- Peat reduction of 40% can be achieved by adding one raw material e.g., Woodfibre.
- To go further and achieve peat free involves mixing several raw materials with different particle sizes for optimum air/water balance.
- Having several raw materials leads to a more consistent quality mix

Physical properties

Provender mix reflects the nursery growing system

- 40% Fibagro std (Woodfibre)
- 30% Coir
- 30% Pine bark (0-8mm)

Chemical properties

- Peat alternatives tend to have higher pH's

- Less Lime added to raise pH leads to lower amounts of Calcium and Magnesium.
- Lime levels reduced from 3 Kg in peat mixes to under 1 Kg in peat free
- Quality control important as raw materials can contain excess unwanted nutrients eg Coir with Sodium

Nutrients & Sustainable Growing Media

Peat alternatives generally require additional nutrients due to:

- Lower buffering capacity meaning nutrients are held less strongly and are more easily leached
- Lower water holding capacity meaning the amount of water held is lower and so requiring more frequent waterings
- Nitrogen lockup from woody materials leading to the need for additional Nitrogen

Water Quality

- Increasingly important with Sustainable growing media
- Taken into account in the nutrient plan
- Soft or Hard water

Water types

Water quality for healthy plant growth

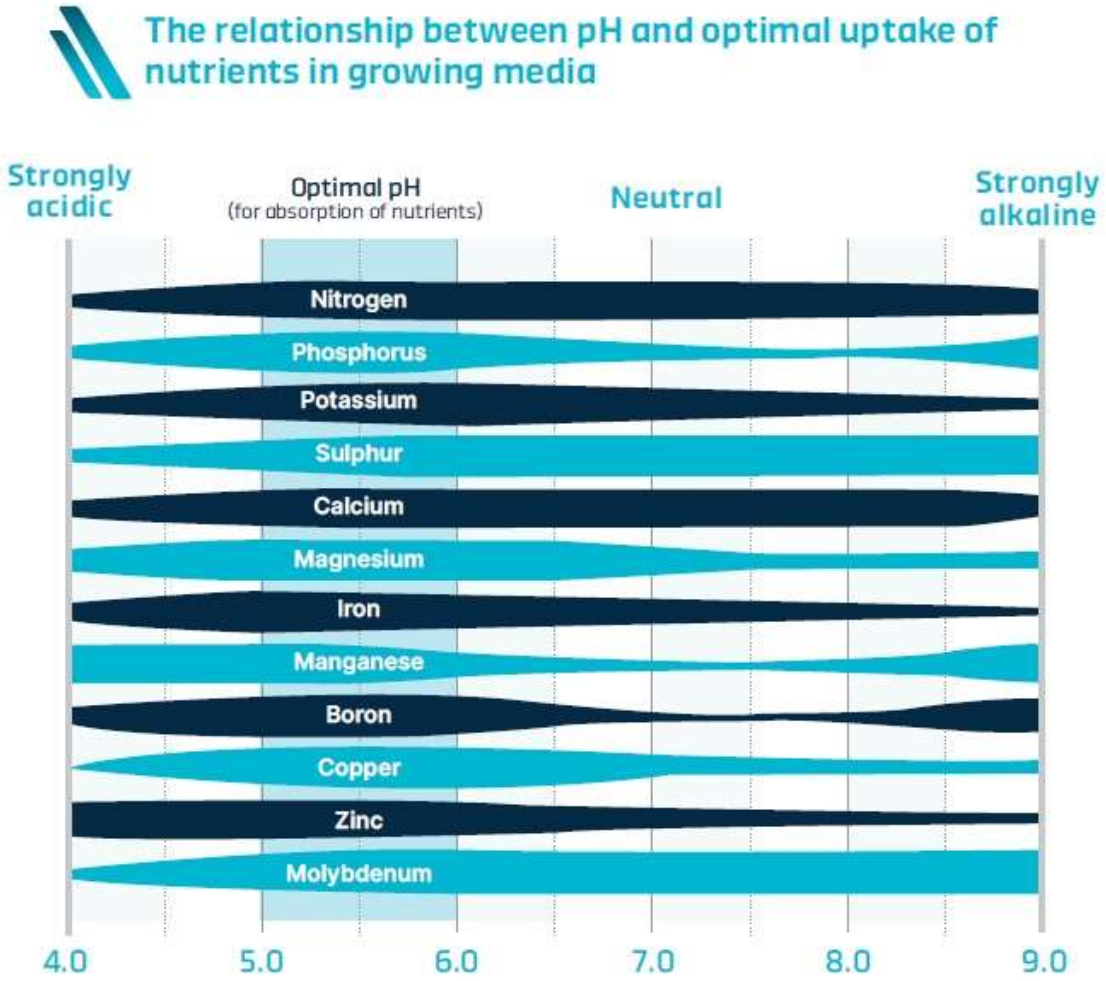
1 | Hard – Alkalinity > 150mg (High in Ca & Mg)

2 | Soft – Alkalinity < 100mg (Low in Ca & Mg)

- Provender water is hard and has the potential to raise the pH of the growing media over time.
- Higher pH can lead to poor availability of nutrients to the plant.
- ICL take this into account when formulating the mix and the starting pH of the media

Why is growing media pH important for plant growth?

Because it affects nutrient uptake!



Example: A high pH limits the uptake of nutrients particularly iron, leading to leaf yellowing and poor plant quality

pH media

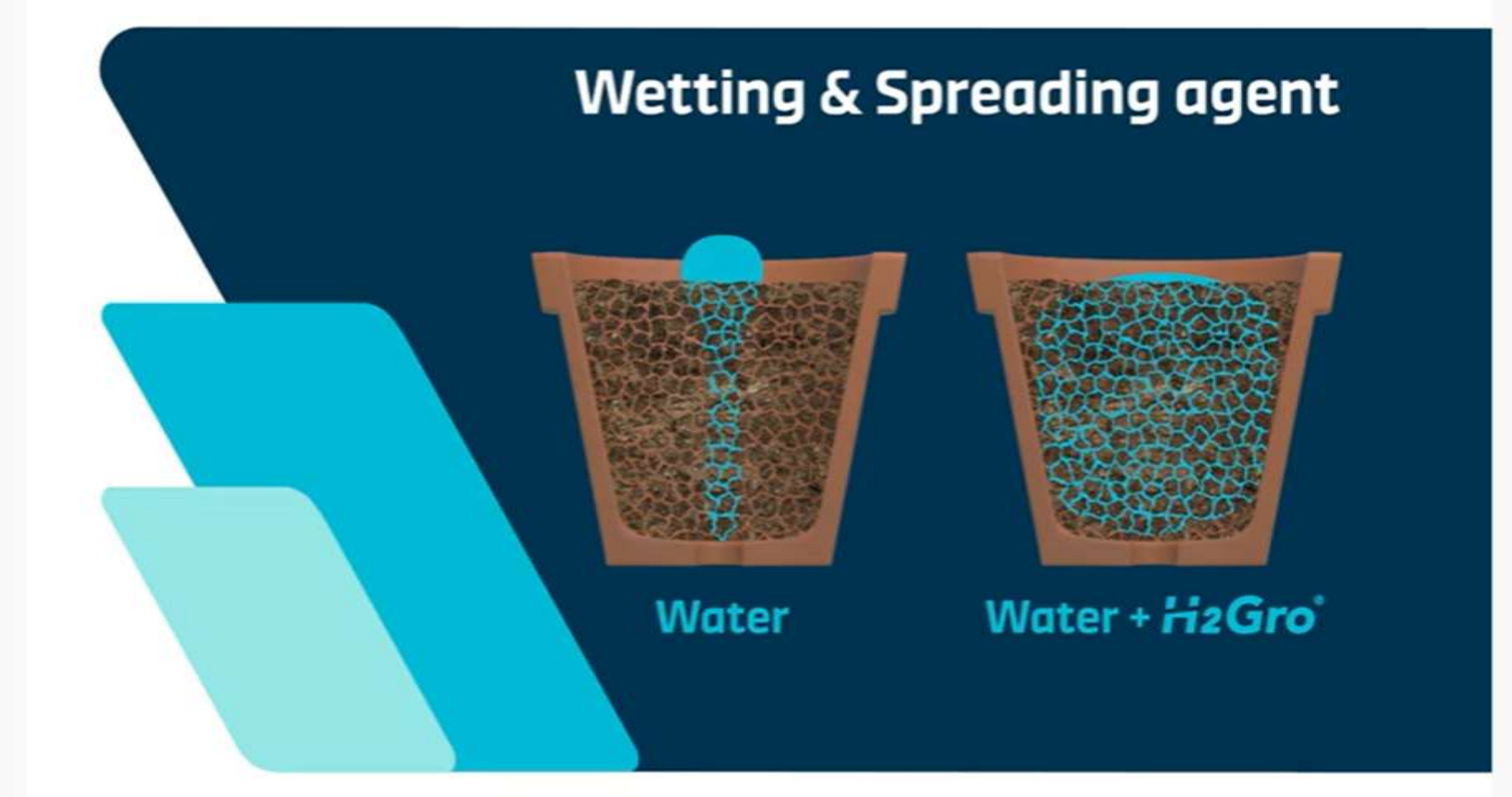
Optimum availability of elements in a peat substrate:

Availability is affected by pH

Iron deficiency on the new growth of a Rose

Water Management

Wetting agents are key to optimum growth



Peat Free media with H2Gro

Growing Media may appear dry on the surface

But will be moist under the surface

Irrigation Tips

- Add extra wetting agent, such as H2Gro to maximise irrigation efficiency and save water
- Use shorter more frequent irrigation cycles
- Monitor pot moisture levels to manage irrigation effectively
- Growing Media may appear dry on the surface but still be moist in the pot
- A thorough first couple of waterings is essential to activate the wetting agent

H2Gro Effectiveness

The use of an effective wetting agent such as H2Gro can spread water evenly throughout the pot, as indicated by the rooting.

Nitrogen & Peat Reduction

- N losses by leaching

- N losses by immobilisation – Barks and Woodfibres

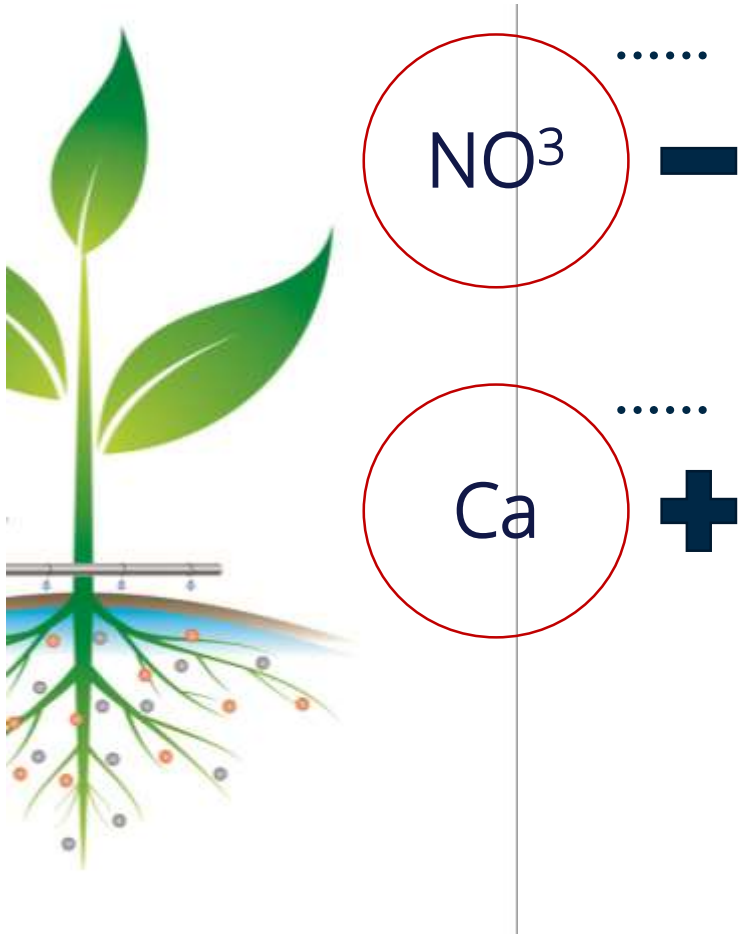
Nitrogen Deficiency

N losses by leaching

NO_3^-

- Lower nutrient buffering of media
- Nitrate easily leached due to negative charge (-)
- More watering

Calcium Nitrate can be easily leached



Calcium nitrate	200g
15.5 % N	31 mg
18.9 % Ca	38 mg

Supplementary Nitrogen products

For peat reduced growing media

Osmocote® N

38-0-5

5-6 Month Release

Osmoform®

38-0-0

10-12 Week Release

Use these products alongside your standard Osmocote or water-soluble program

Fibagro®

Osmocote® 5

H2Gro®

ICL

Fibagro®

Osmocote® 5

H2Gro®

ICL

Growing Solutions - Fertilisers

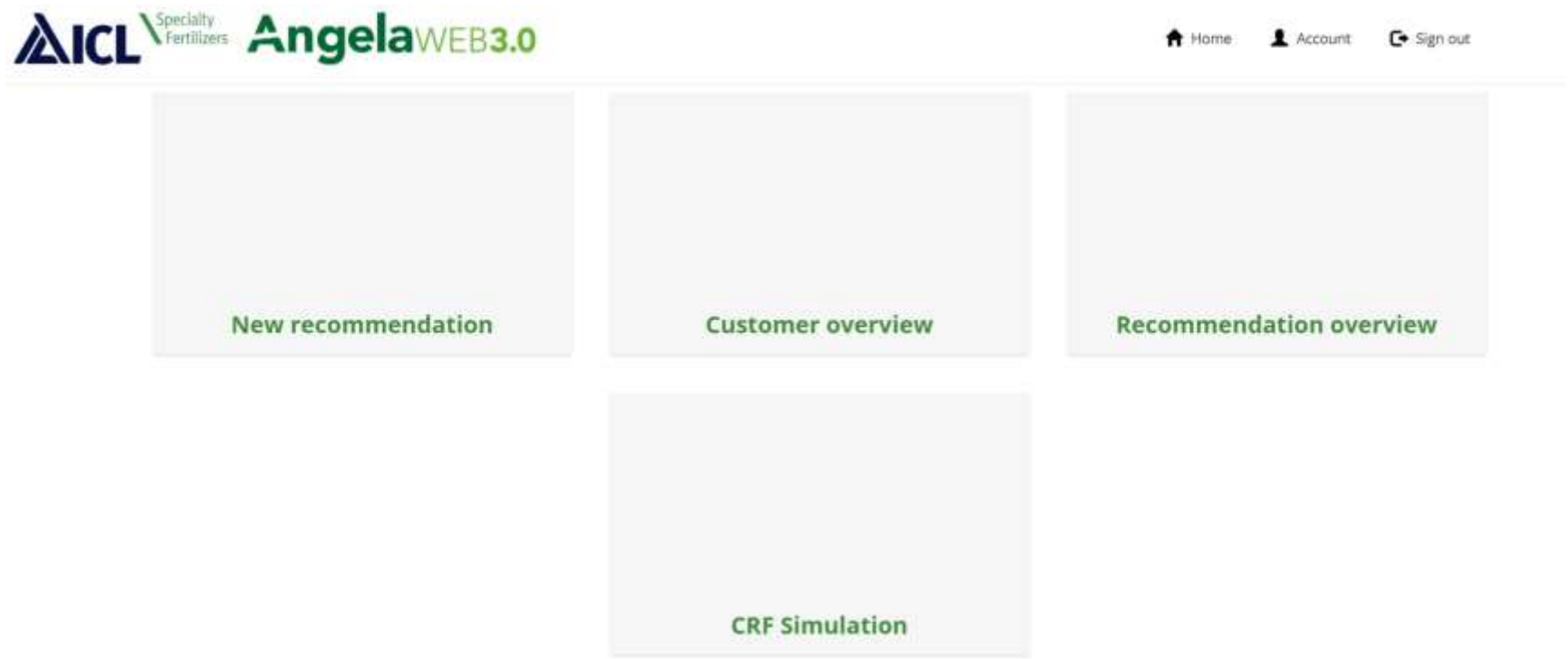
ICL work closely with growers to match nutrition plan to nursery requirements

ICL look at numerous factors:

- Crops and timings
- Local weather data
- Specific recommendation or general
- Sustainable Growing media – Peat reduced / Peat Free
- Water quality
- Irrigation type
- Nursery technical level
- Nutrition type CRF / WSF or combination
- People

Fertiliser recommendations

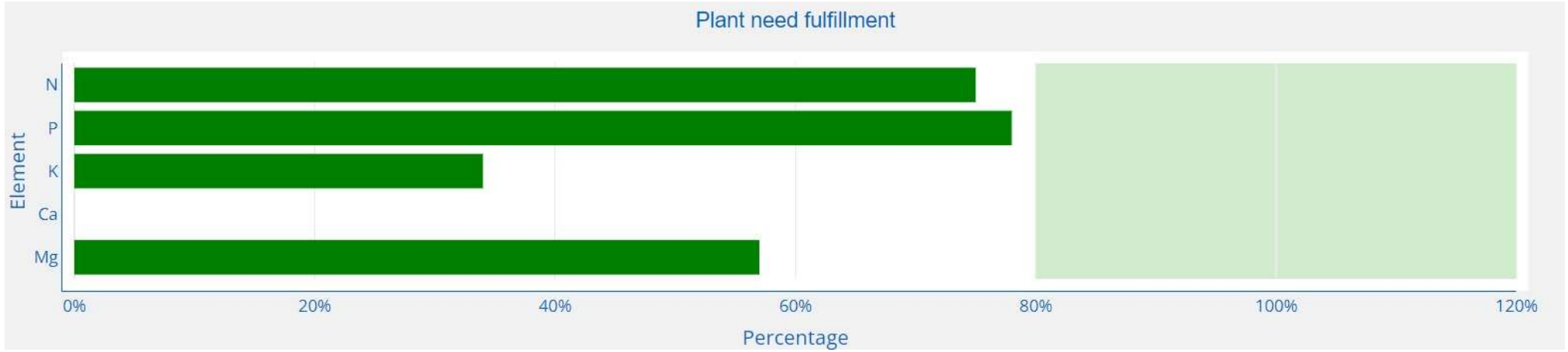
Crop Nutrition Tool



AngelaWEB3.0

Plant Needs

Review the current Grower nutrition plan



CRF Simulation

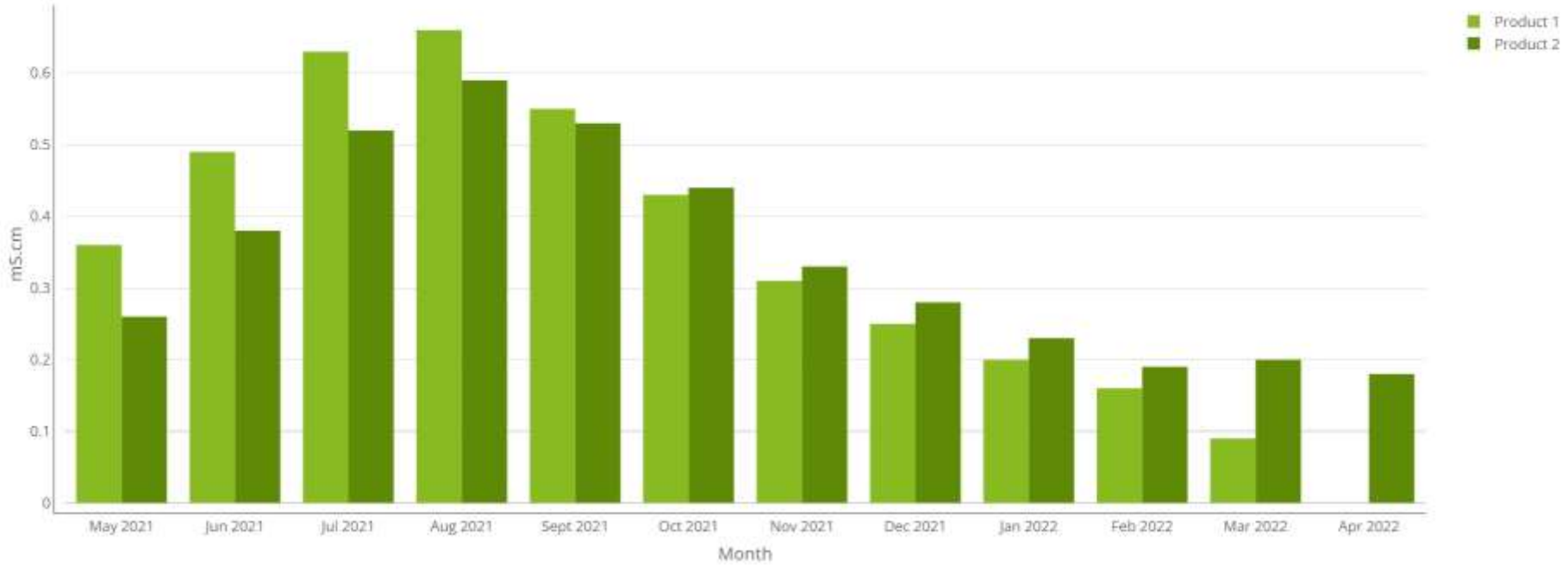
AngelaWEB3.0

Product 1 | Osmocote 5 - 8-9 Months | Application rate | 5.00

Product 2 | Osmocote 5 - 12-14 Months | Applicatio... | 5.00

Osmocote 5

Birmingham



ICL

Sustainable Growing Media

Match Plant demand to fertiliser release

S-curved RELEASE

FEED = NEED NutriMatch® Release

Improve available water and rewetting

H2Gro®

Typically, higher rates with Peat Free + 25%

Trace Elements OTEA® system

Osmocote® 5

ICL

Provender Nutrient Package

Micromax® Premium

Osmocote® N

Osmocote® Exact High K

H2Gro®

H2Gro®

Micromax® Premium

Osmocote® Exact High K

Osmocote® N

Growing in peat reduced & peat free

Things to remember

- Adapt irrigation to reflect the potentially lower water-holding capacity of peat-free substrates
- Extra nitrogen will be required to compensate for nitrogen lock up with the peat free growing medium, particularly if containing wood-based products
- Peat-free materials generally have a much lower buffering capacity than peat-growing media, meaning nutrients are easily leached
- Peat-free growing media require less lime to correct the pH and provide less calcium and magnesium which needs to supplementing in other ways
- Before growing in peat-free growing media it is important to review the nutrition of the mixes, typically 25% higher rates of fertiliser are needed.

Provender now grow all their production, Peat Free

Thinking of the future

Future of Growing Media


Levington® Advance

Thank you

Any Questions

andrew.wilson@icl-group.com