Management of crop nutrition

Adapting to sustainable growing media

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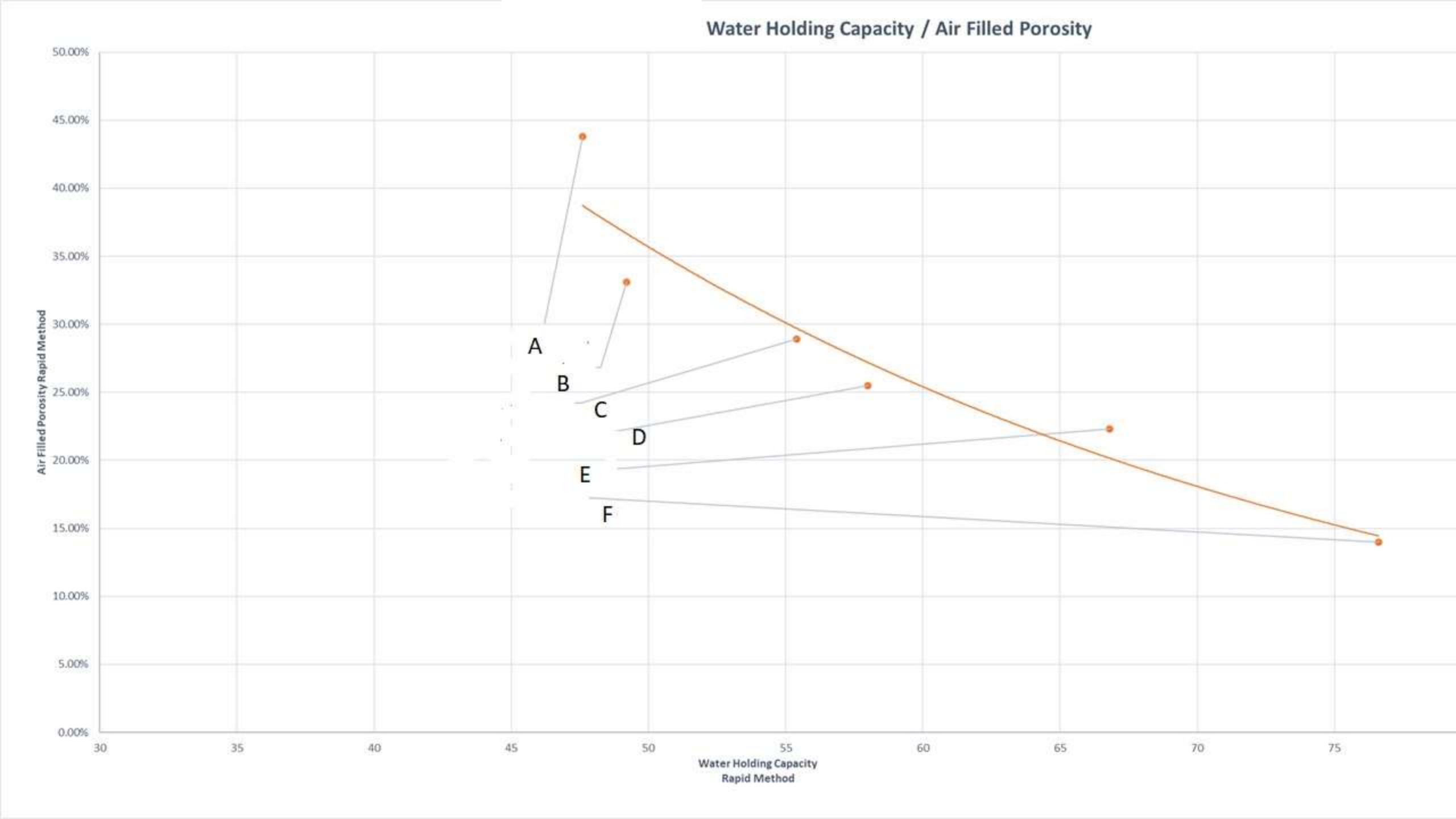
Sustainable growing media Physical properties

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 eg woodfibre.

To go further and achieve peat free involves mixing several raw materials with different particle sizes for optimum air / water balance.

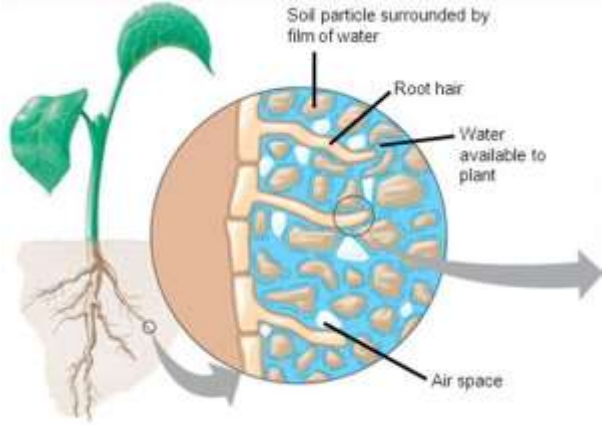

Water Holding Capacity / Air Filled Porosity
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Air Filled Porosity Rapid Method
30
35
40
45
50
55
60
65
70
75
Water Holding Capacity
Rapid Method
A
B
C
D
E
F

Nutrients and Sustainable growing media

Peat alternatives generally require additional nutrients due to:

- **Lower buffering capacity meaning nutrients are more easily leached;**
- **Lower water holding capacity with more frequent watering;**
- **Nitrogen lockup from woody materials**

Cation Exchange Capacity



What effect does it have?

The cation exchange capacity helps to regulate the supply of certain nutrients, such as Ca^{2+}, Mg^{2+}, K^{+}, NH^{4+} and Na^{+}. CEC also affects the regulation of pH. Growing media with a high CEC will recover more quickly from acidification compared with a media with a low CEC.

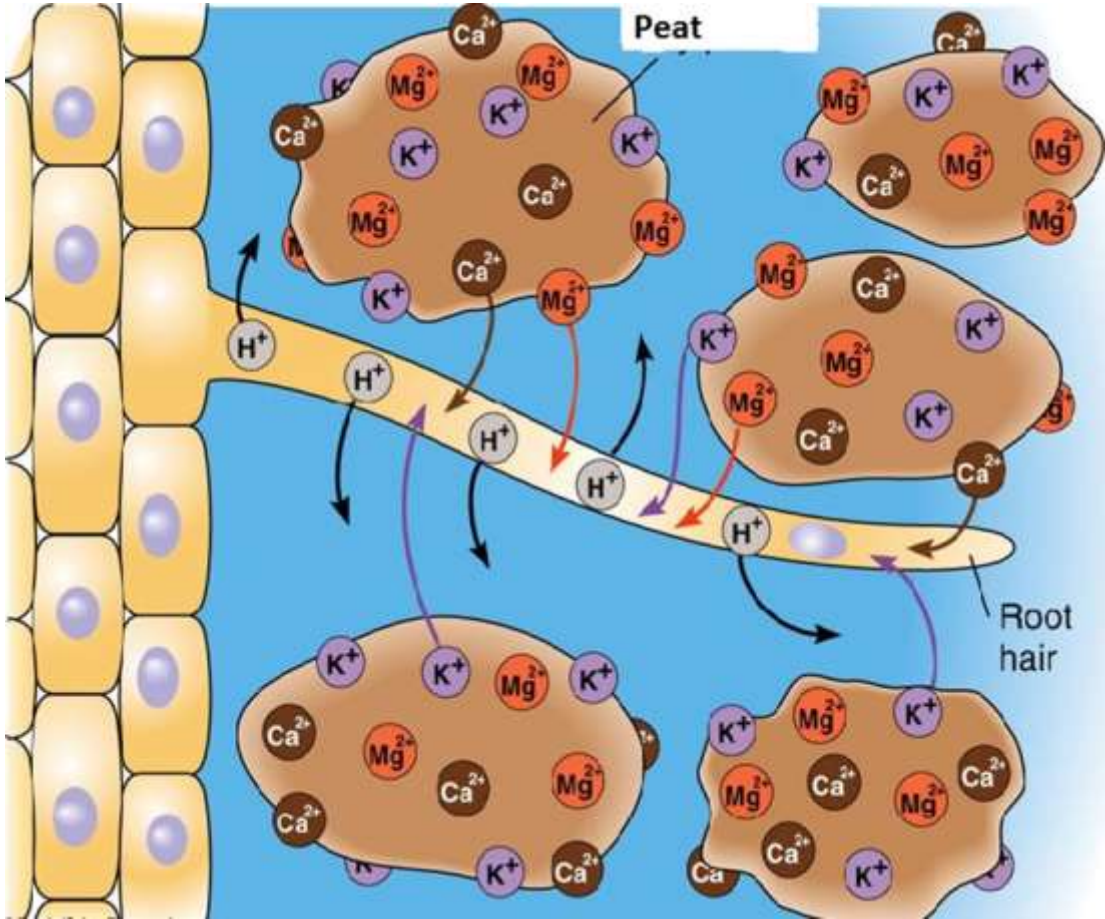
Low CEC: The media lack the ability to hold on to cations, resulting in nutrient leaching and deficiencies particularly in Potassium K^{+} and Magnesium Mg^{2}.

Effect : More applied nutrients in solution and greater leaching

Water soluble fertilizers easily leached,

Controlled release products much less so.

Less pH Stability , Water Quality more important eg Hardness



Optimising plant quality in Sustainable Growing Media mixes

1

Water

2

Nitrogen compensation

3

Crop nutrient requirements


8

Water Quality

Increasingly important with Sustainable growing media

Taken into account in nutrient plan

Soft or Hard water

Water types

1. Hard - Alkalinity > 150mg
2. Soft - Alkalinity < 100mg

Nutrition for plant growth stages

- Nutrient ratios affect growth

- Ratio of Nitrogen to Potassium

- High Nitrogen promotes growth.
- Softer foliage

- High Potassium promotes harder compact growth and flowering.
- Potassium increases resistance to Biotic & Abiotic stresses. Low K leads to poor Frost resistance

- A complete range of essential nutrients still needs to be applied

- Check water quality and apply Hard Soft water feeds for optimum nutrient availability in your water.

Irrigation

- Different compositions of the growing media require different methods of irrigation.
- Get used to the ‘new requirements’ of irrigation in your pots, when you make changes.
- Less water-holding capacity means quicker drying out
- Aim for even moisture in the root-zone
- The plant always needs water for the absorption and transport of

Optimum moisture in the root-zone, is crucial for root-

Water management

Irrigation Tips

- Add extra wetting agent, such as H^2Gro to maximise irrigation efficiency and save water;
- Use shorter more frequent irrigation cycles;
- Monitor pot moisture levels to manage irrigation effectively
- 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

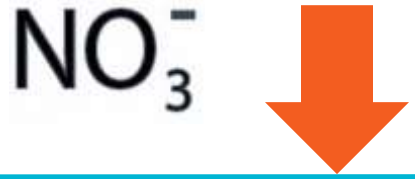
Nitrogen and peat reduction

N losses by leaching -

N losses by immobilization - Barks and woodfibres

Nitrogen Deficiency

N losses by leaching

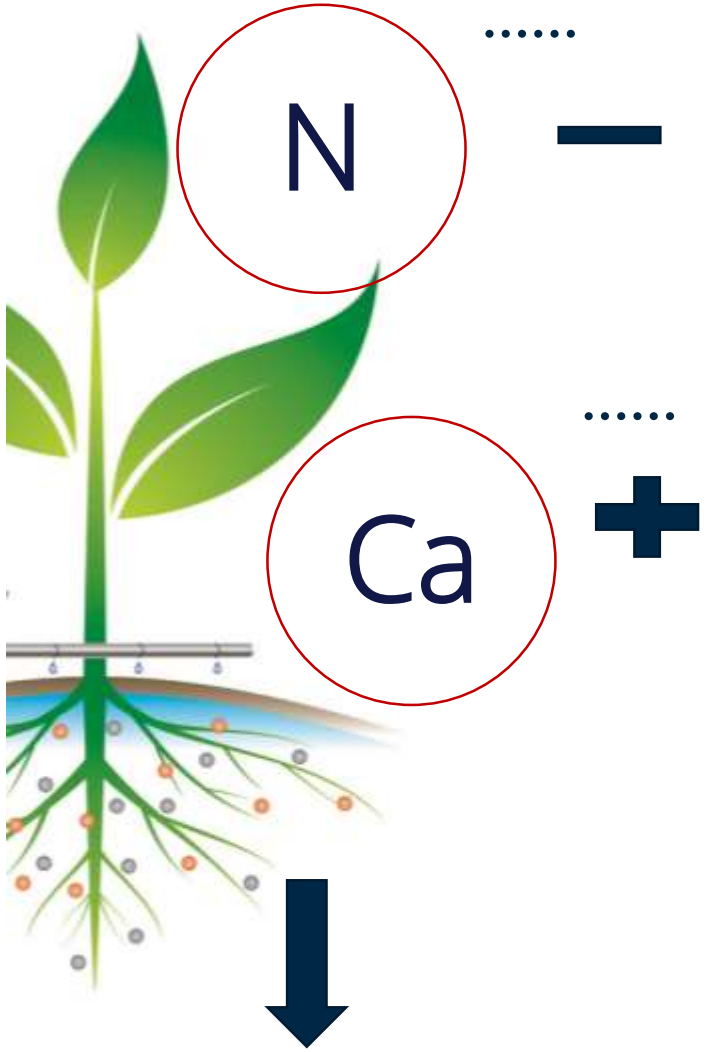


lower nutrient buffering of media

Nitrate easily leached due to negative charge (-)

more watering

Calcium Nitrate



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

Supplementary Nitrogen products for peat reduced growing media

Osmoform®
High N
8 to 10 Week Release
38-0-0

Osmocote®
N
5-6
38-0-5

Use these products alongside your standard Osmocote or water soluble program

Growing Solutions - Fertilisers

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

Look at a large number of factors:

Crops and timings
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

Growing Media application

CRF

WSF

SR

Supplementary application

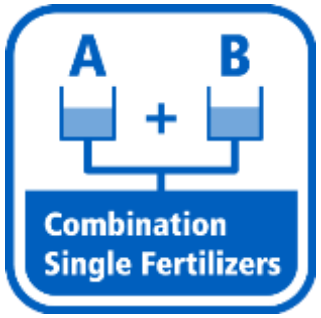
WSF

Topdress

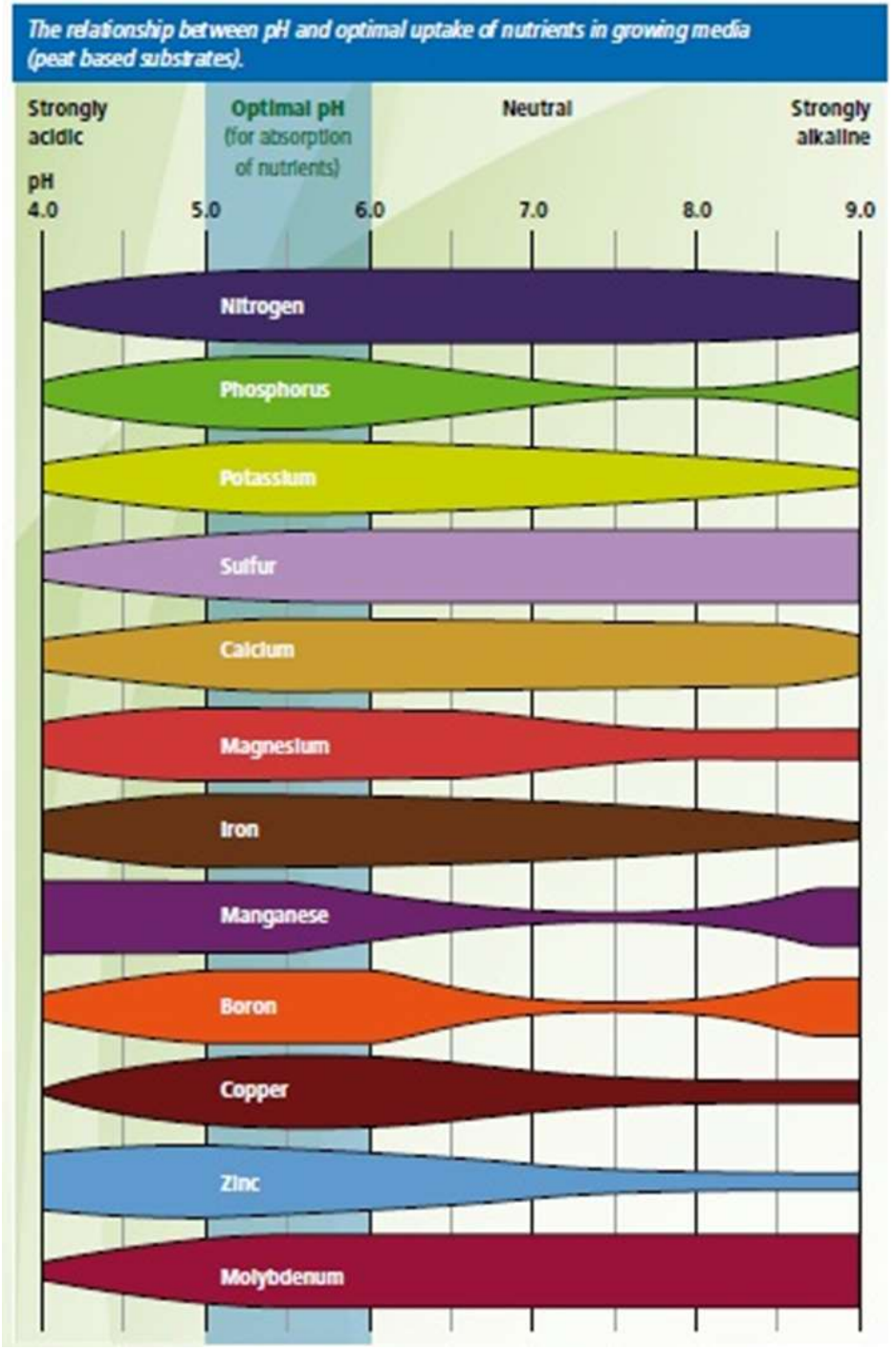
Foliar

Base fertilizer

+

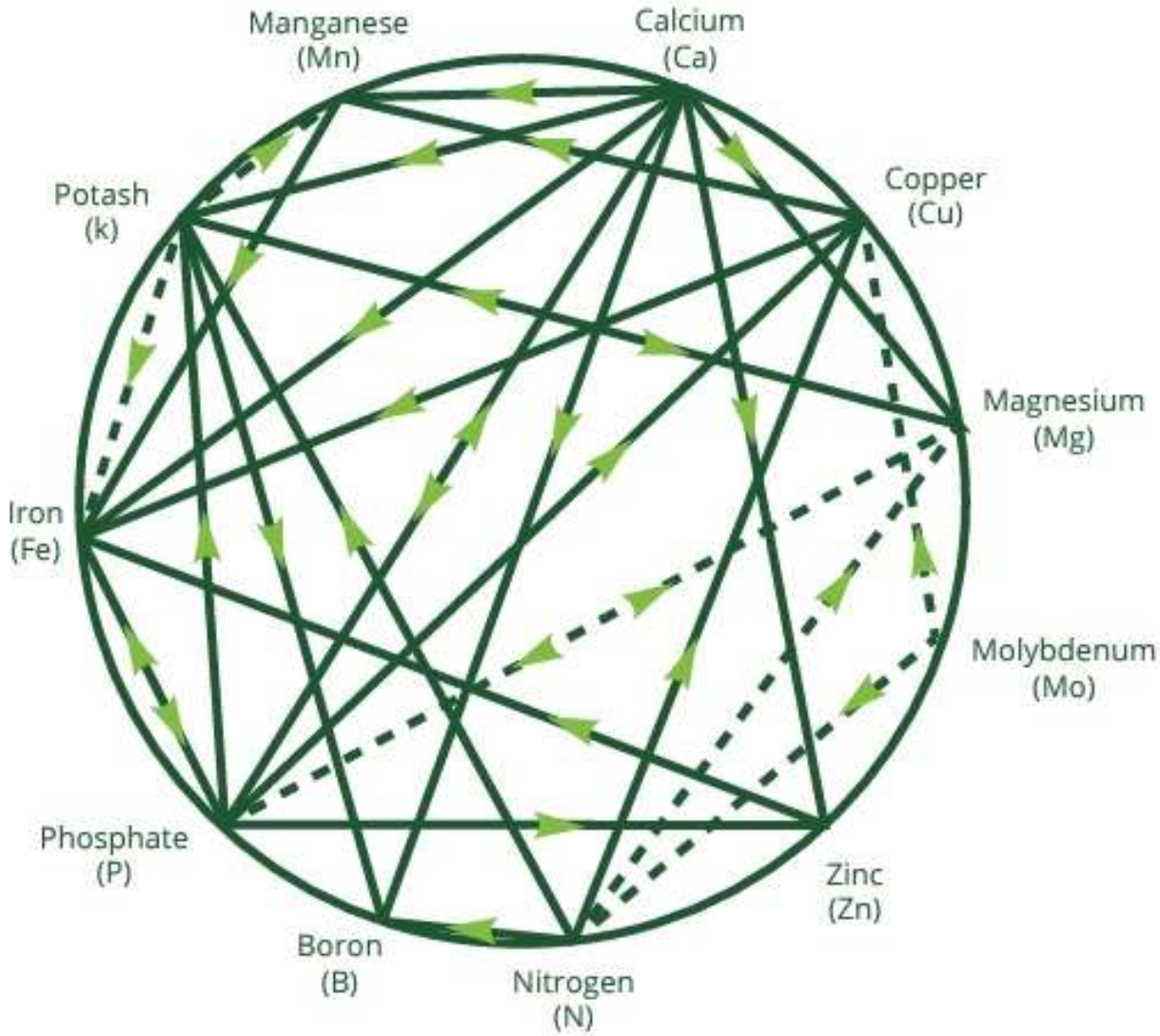


pH* is key to nutrient availability

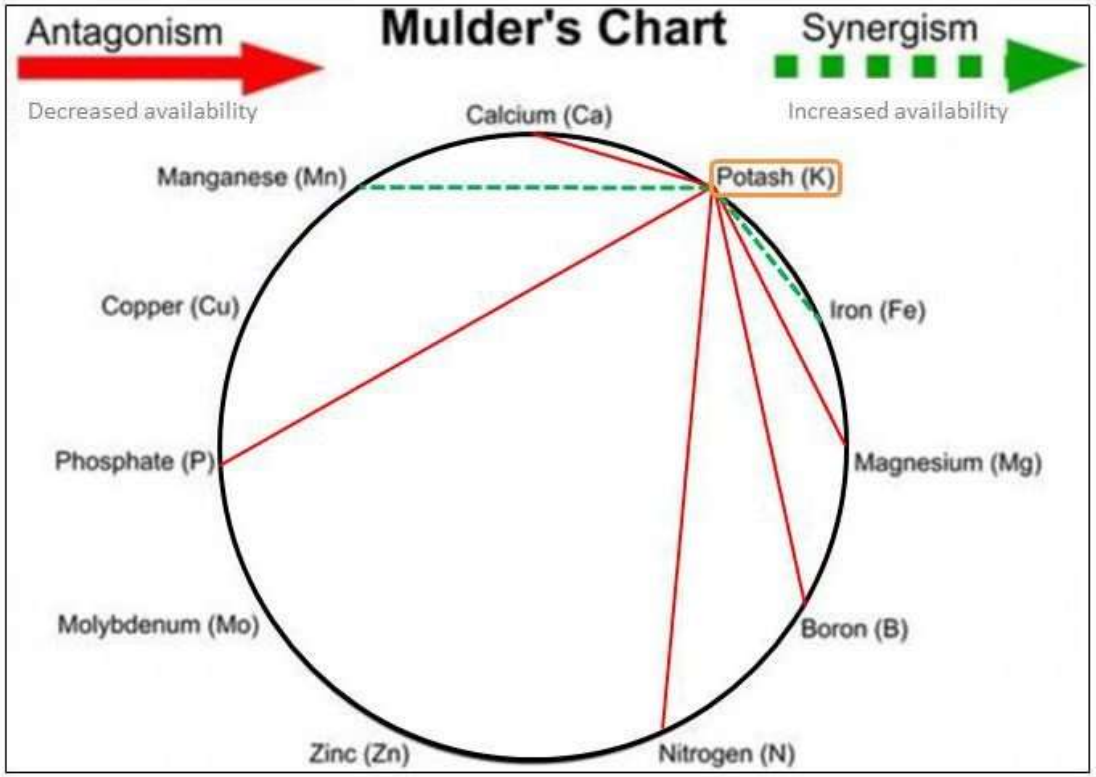


*** (water / Growing Media)**

Keep nutrients in balance



Potassium interactions



Tools

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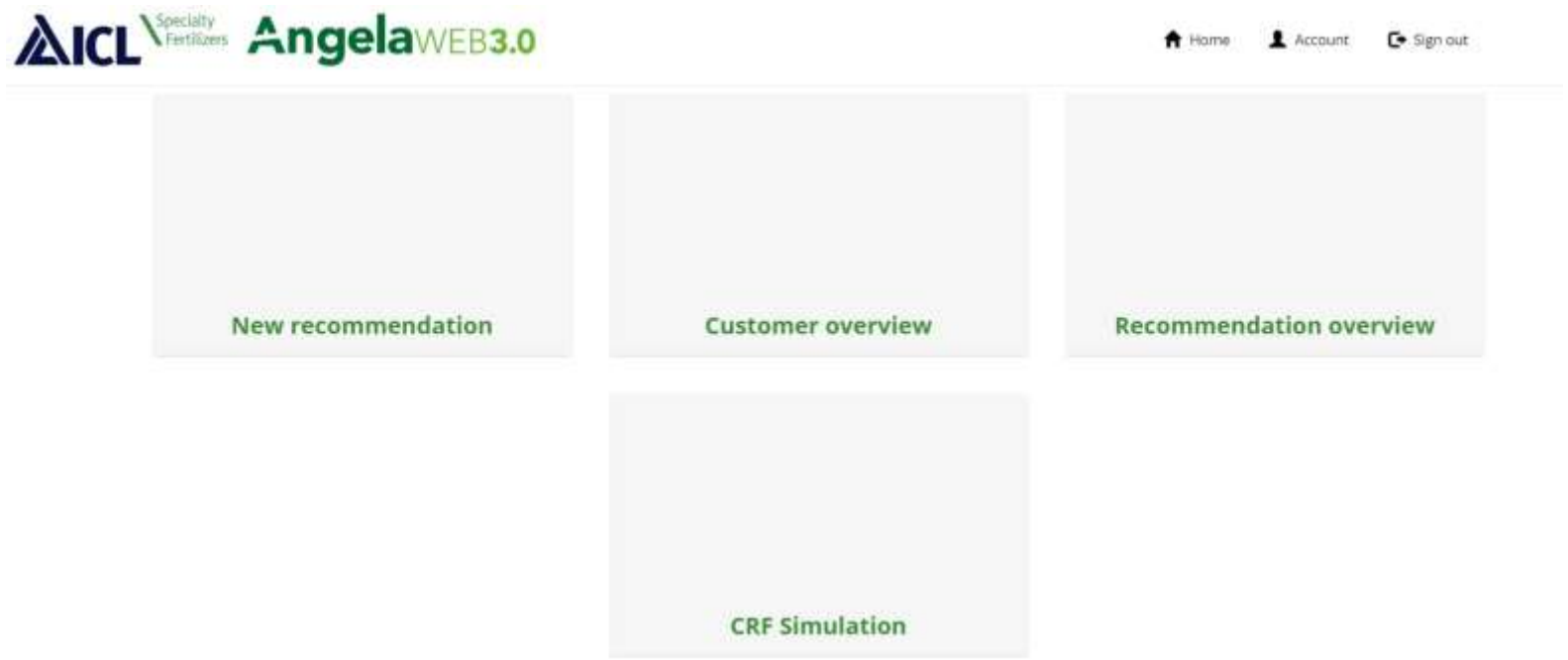

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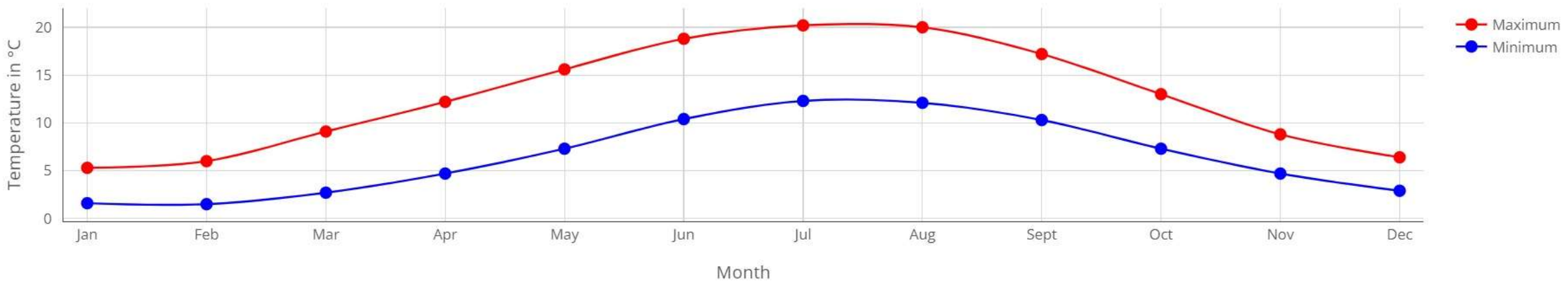
CRF Simulation

Choose the best longevity and rate of Osmocote

Based on your potting date, sales period and local climate data



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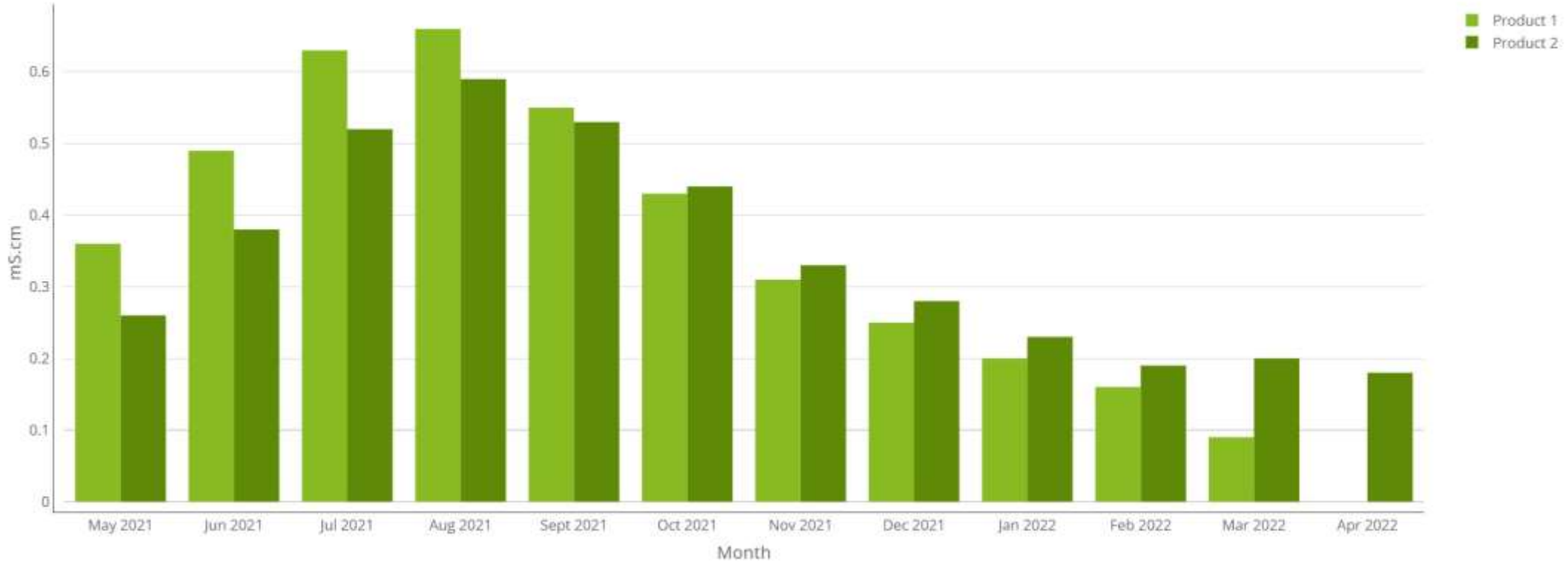
Osmocote® 5

CRF Simulation

Birmingham

Product 1	Osmocote 5 - 8-9 Months	Application rate	5.00
Product 2	Osmocote 5 - 12-14 Months	Applicatio...	5.00



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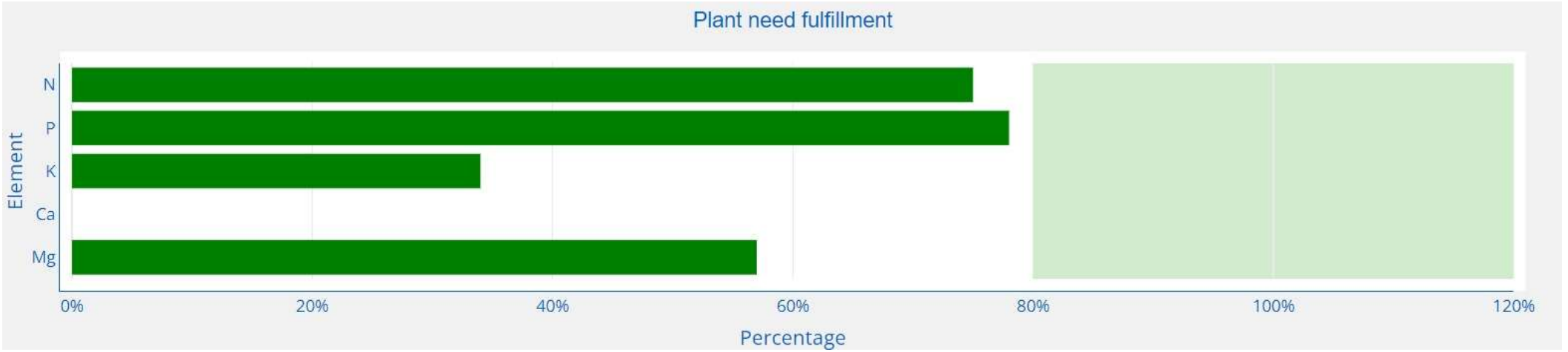
Plant Needs

Review current Grower nutrition plan



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Select Growth Stage

Crop: Cyclamen

- [x] Vegetative phase
- [x] Generative / final

Plant Needs

ICL Growing Solution

Sustainable Growing Media

Increasing Peat reduction

Less Nitrogen stability
Lower water holding
Greater leaching of nutrients
Feed earlier WSF/ 25% higher rate

Traditional NPK base fertilisers (Pg mix) leach easily

Osmocote® Start

CRF & SR Nitrogen

Osmocote® N

Osmoform® High N

Sustainable Growing Media

Match Plant demand
to fertiliser release

Typicallly higher rates
with Peat Free + 25%

S-curved RELEASE

FEED = NEED NutriMatch® Release

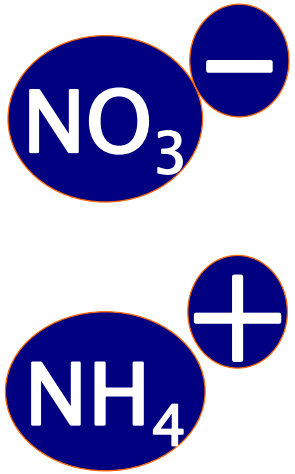
Trace Elements OTEA® system

Osmocote® 5

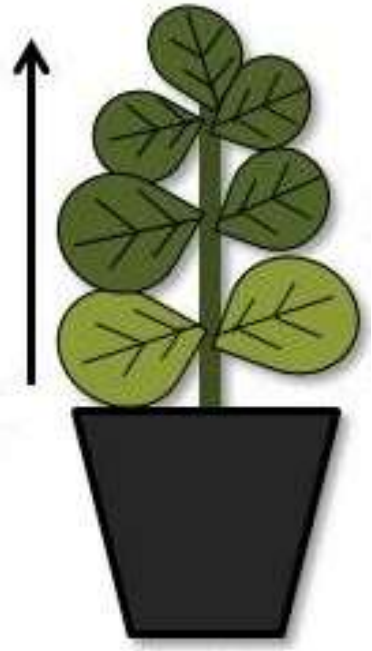
Improve available
water and rewetting

H2Gro®

Major Nutrients - Nitrogen



Mobile



Role: Building block of proteins

Deficiency: Pale new growth, enhanced rooting
Older Leaf reddening.
Toxicity: Very blue green tissue, Soft growth
susceptible to disease

15th July2022

30% Fibagro®

Osmocote® 5

H2Gro®

ICL

1st October 2022

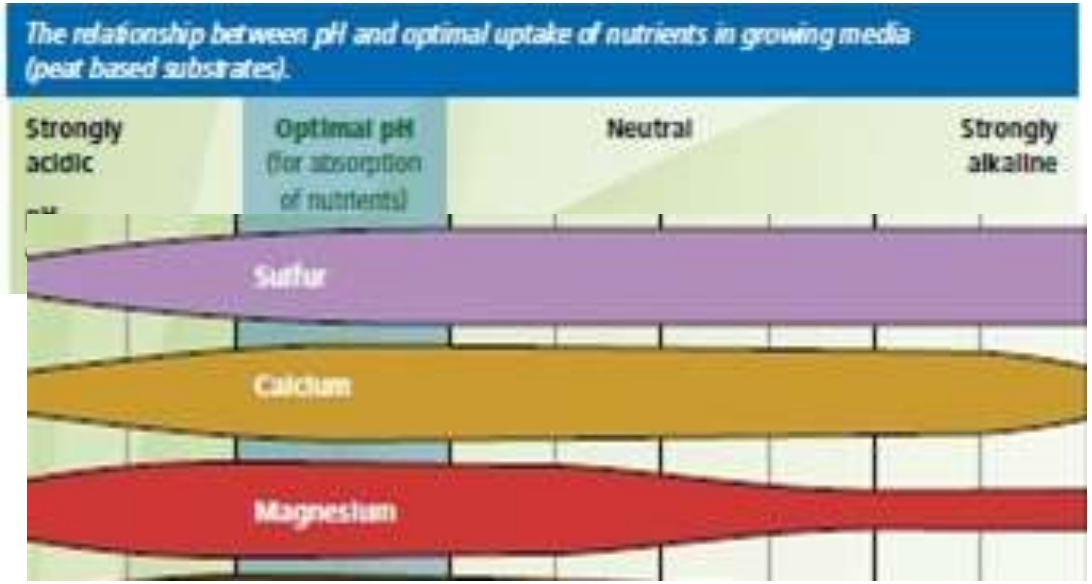
30% Fibagro®

Osmocote® 5

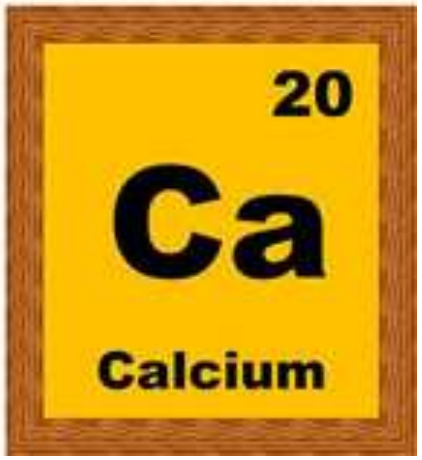
H2Gro®

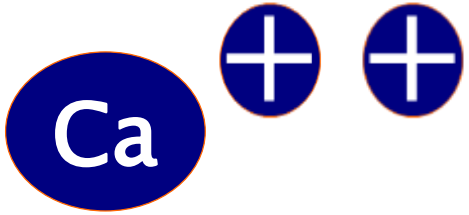
ICL

Minor Nutrients



Minor Nutrients - Calcium





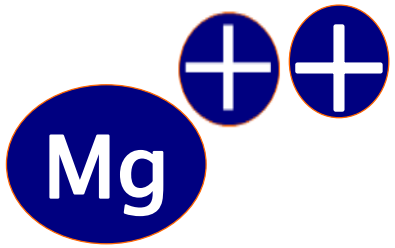
Immobile

Role: Cell walls, Quality element: improves shelf life, disease and stress resistance

Deficiency: Tip burning in young leaves. Risk in Soft water and Peat Free media. Common with high humidity.

Toxicity: Stunted growth deficiency of Magnesium

Minor Nutrients - Magnesium



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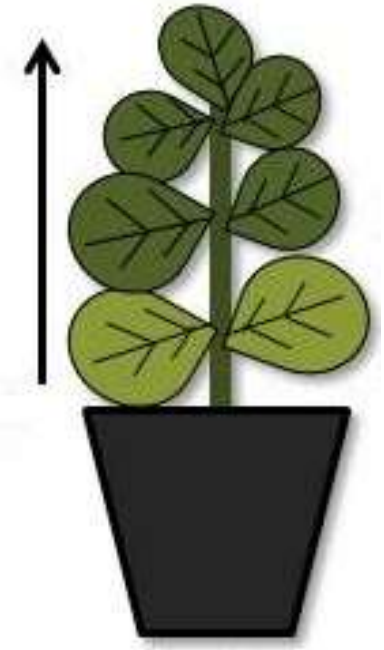
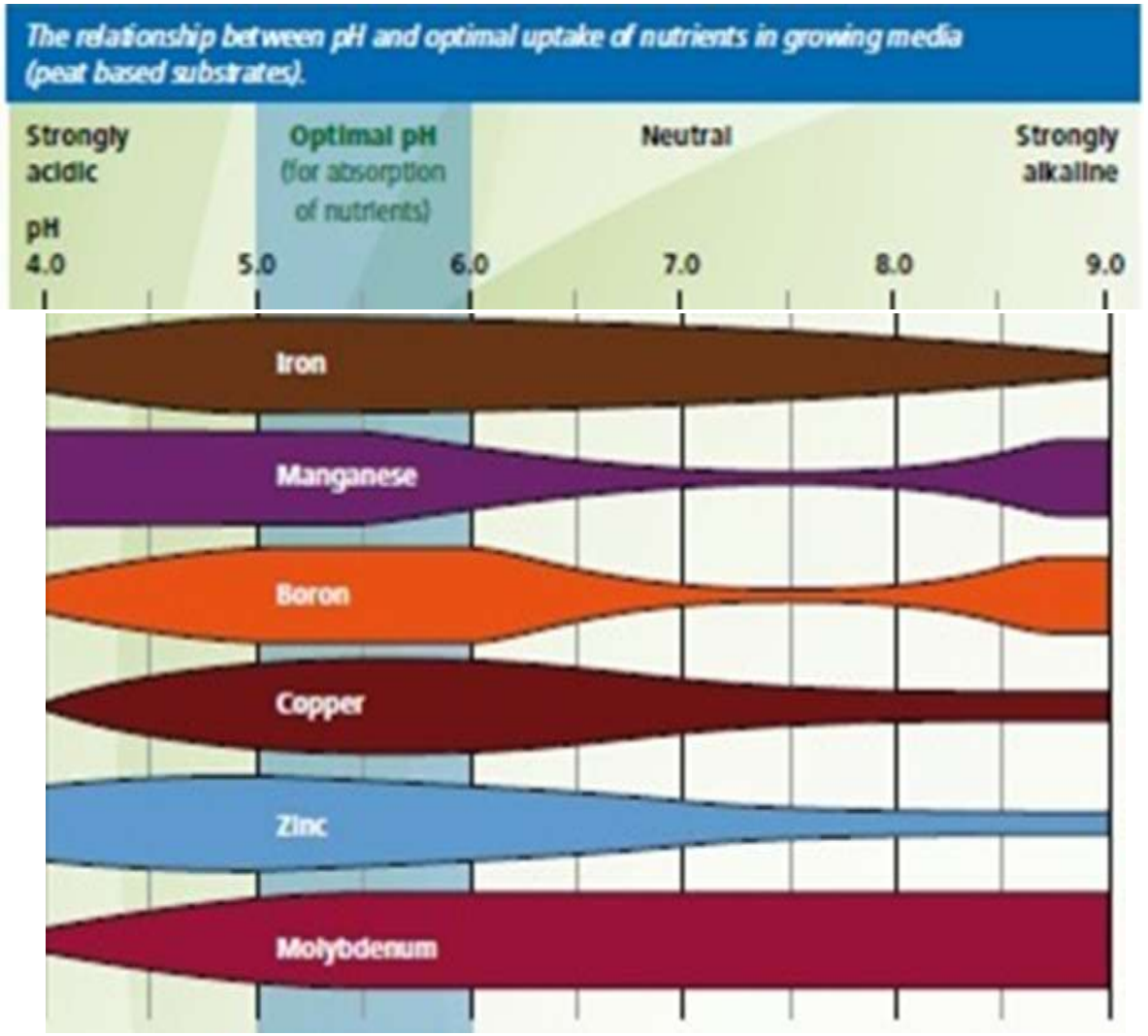


Role: Chlorophyll , Cell walls

Deficiency: Intervienal chlorosis in older leaves. Risk in Soft water and Peat Free media

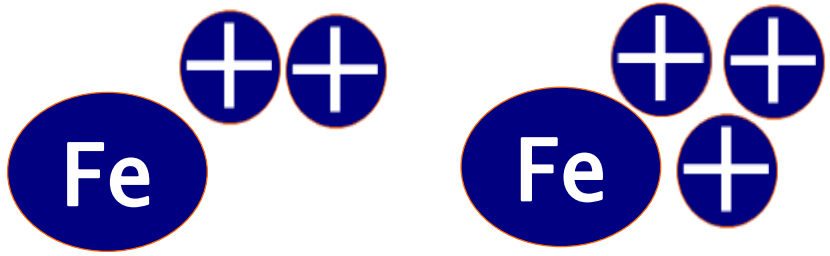
Toxicity: Not common

Trace Elements and pH

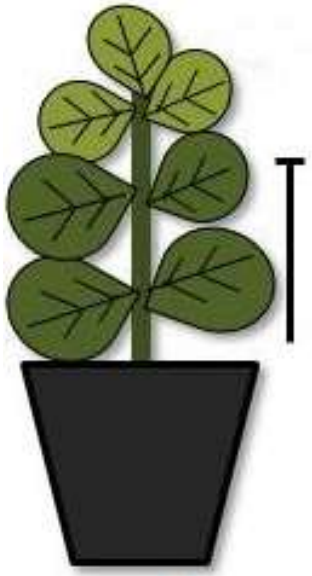


Trace Elements

Immobile



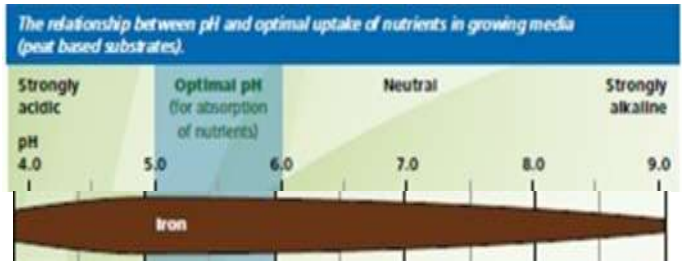
Chelated EDTA , DTPA



Role in Protein and Photosynthesis synthesis

Deficiency : striking interveinal chlorosis of young tissue. Poor availability as pH rises

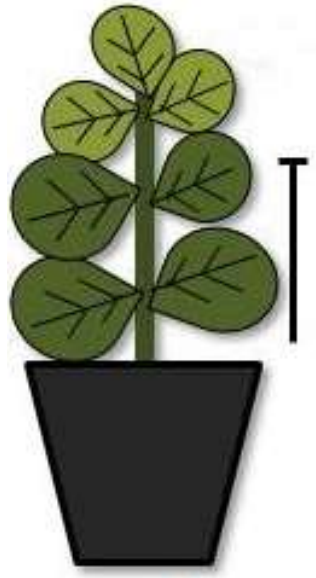
Toxicity : Excessive dark green foliage and burning



Trace Elements

Immobile

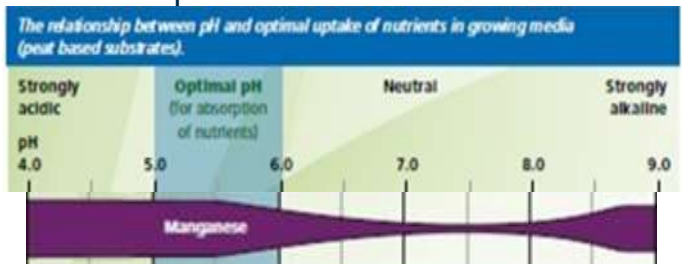
Chelated EDTA



Role: Enzyme systems, Nitrogen transformation, Chlorophyll

Deficiency: Interveinal chlorosis in young leaves, similar to Fe but also necrotic spots.

Toxicity: Chlorotic followed by necrotic parts on leaves, often start at older leaves followed by younger parts, Sometimes purple brown veins or spots.



Peat Free Mixes 2023

Peat Free Mixes 2023

Peat Free Mixes 2023

Things to remember when growing in peat reduced and peat free

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

ICL Professional Horticulture


Grow, Nurture,
Protect your
future
ICL

Thank you

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