



Understanding methods of analysis in relation to peat- free mixes

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Available methods

- Total Acid digestion
 - Reveals everything but does not relate to available nutrients
- Saturated chemical extractant
 - Used for soils to displace nutrients from exchange sites
- Calcium Chloride solution extraction
 - Particularly favoured in Germany
- Water extraction
 - Pan European method for GM, but different countries use their own variations

Development of the water extract methods

- In Holland the Water extract method was developed on:
 - Predetermined moisture content samples,
 - Extracted then at 1:1.5 volume of water
 - Results reported in mmols of the element
- In the US there were two water methods,
 - Saturated paste then extracted under vacuum
 - Pour through method
 - 1:2 also used

Water methods in the UK

- Some in house labs use 1:2 by volume extraction with water
- ‘Fisons’ developed a QA lab method based on 1:6 by vol extraction,
 - This was then independent of the initial sample moisture content
 - Was a relatively quick in-house method to check that nutrients had been added,
- The ‘Fisons’ method was adopted by the then ADAS for use with GM,
 - The method did have limitation due to solubility of various elements,
 - Originally only for NPK Ca & Mg, pH and Ec – trace elements were not recorded, as equipment did not measure them,

Development of 'Pan European' method

- It took 12 plus years to arrive at a tried and tested method
 - This was based on a 1: 5 water extract and was 'ring' tested,
- Adopted in the UK but in Holland they stuck to their 1: 1.5 method and in Germany they favour the extraction with Calcium Chloride
 - **The main problem is that you cannot do a cross comparison between methods and results.**

Limitation of the 1:5 water extraction

- It works well for soluble nutrients:
 - Nitrate N, Chloride, Potassium are readily recovered
 - Less so for Ammonium N, and Boron
- It is not good for less soluble nutrients:
 - Not good for Phosphorus and Calcium,
 - Speculative for elements such as Iron and Manganese
 - Impossible for Copper, because of the Organic matter adsorption,
- German method with CaCl_2 would be better for P & Ca.

So where are we???

- We have 50 years plus of interpretive guidance on the use of the water extract method with peat based substrates,
 - We have at best 10 years of experience of interpretive information for non-peat based mixes,
 - We positively know that if Composted Green waste is included in mixes, then water extraction will not give a terribly helpful picture,
 - **If Organic fertilisers are used then the WS analysis is of little use!**
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- **We need to build new data bases for interpretation of analysis results**

On- Nursery Considerations:

- Do you receive a detailed manufacturers specification?
 - Whilst it will indicate total NPK -etc added, what about the availability?
- Do we test substrates as they arrive?
- How do we store them?
- Do we re-checked stored materials ahead of use, especially with more biologically active ingredients?
 - **Thank you, any questions?**