

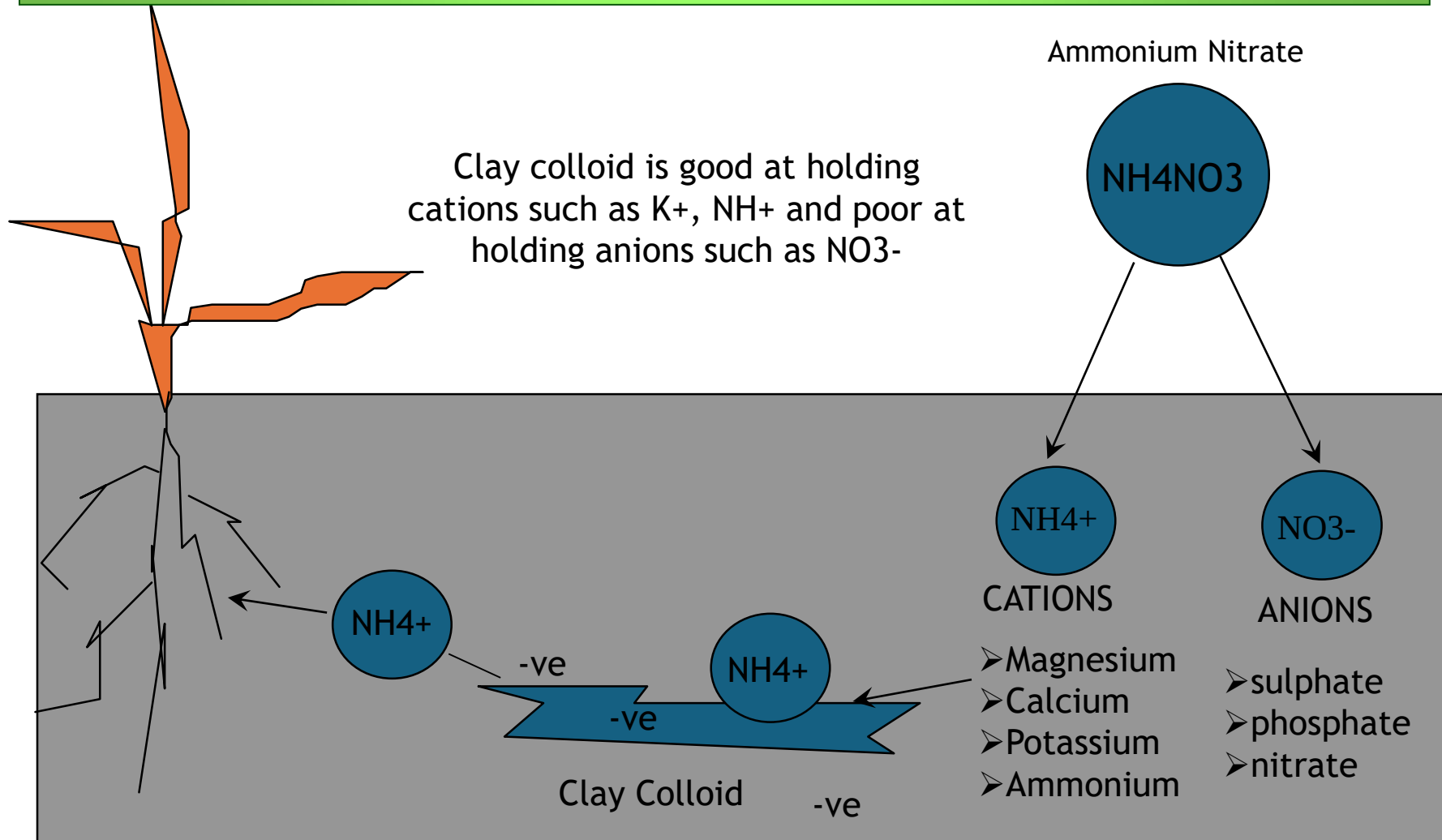
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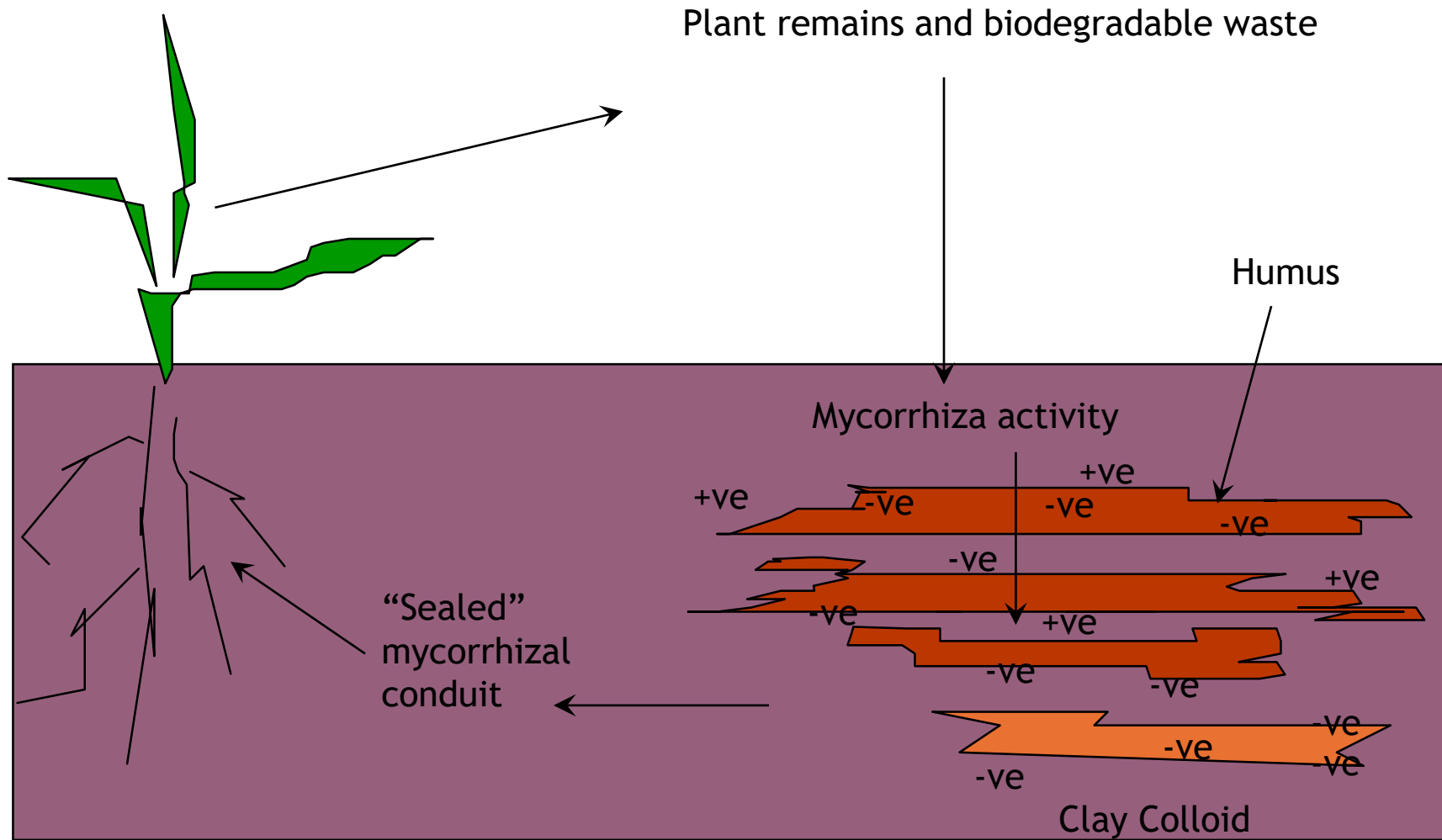


HOW THE PLANT FEEDS - MINERAL FERTILISER



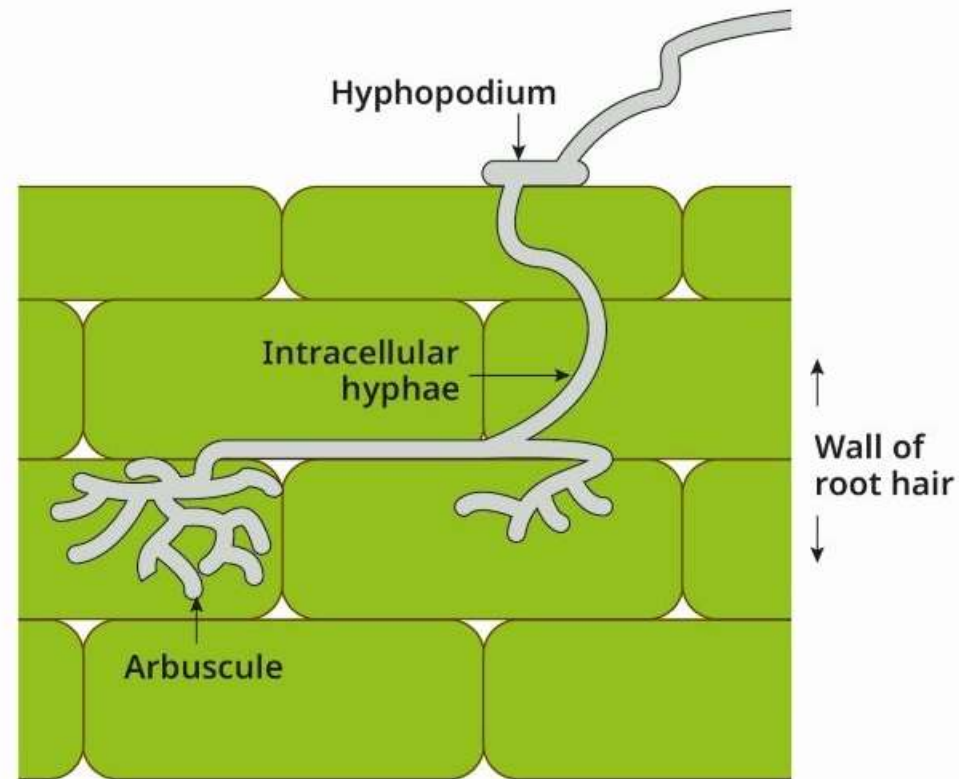
When mineral fertilisers such as Ammonium nitrate are applied, the cations are held in the soil colloid "bank" which also holds water. However, rain will take nearly half of the nitrate into groundwater.

HOW THE PLANT FEEDS - NATURAL ECO-SYSTEM



Mycorrhiza are the key to pollution control because they give a "Closed Loop" to recycling both cations and anions. Organic-based systems do not leak nutrients.

Fig 2.3 The mycorrhizal hyphae crosses the root hair wall into the plant



SurfacePrep in Sheffield make Blast Media

Expanding production

Large sizes – can sell all

Small sizes – maybe limited profit sales

So ? – is there a possible new market?

Product 54 F used to polish helicopter blades

Size – 80% from 250 microns down to 100 microns

Product 54SF used as a filler in building products

Size from 150 microns down to zero

Microplastic?

STOP – what is UFOG?

Biproduct from manufacture of plastic components such as electrical fittings, toilet seats etc, in China, where it has been shredded and screened, then sold to SurfacePrep in the UK, i.e. it is purchased.

SurfacePrep then shred it again and screen it to suit their product range, then sell it to industrial users as polishes and cleaners.

Amino Moulding Powder is manufactured using approximately:

Formaldehyde 29% Urea 40%

Paper Pulp 30%

Pigments and stabilisers 1%

Injection under pressure into moulds the forms electrical components, toilet seats, etc

Formaldehyde 29% Urea 40% —→ **Ureaformaldehyde**

UFOG – UreaFormaldehyde Organic Granules

Ureaformaldehyde

is a fertiliser in global use



Would the **surface to volume ratio** be wide enough to allow the soil microbial population to digest it?

20.07.27. Photo of lettuce



Lettuce at 29 July 2020



C

Above ground
weights:

252 Grammes



B

196 Grammes



A

134 Grammes



It was decided to add a further batch, again with the same treatments.
However, in this case, there was little observable difference in the treatments.



On the photograph below, the UFOG grown plant is on the right.



So, what have we learned?

1. Soil micro-organisms will digest microplastics and feed nutrients to a crop.
2. There is much to learn about soil, humus, micro-organisms and how the process can be managed under field conditions.
3. We still have a few practical problems in terms of in-field, farm operations.

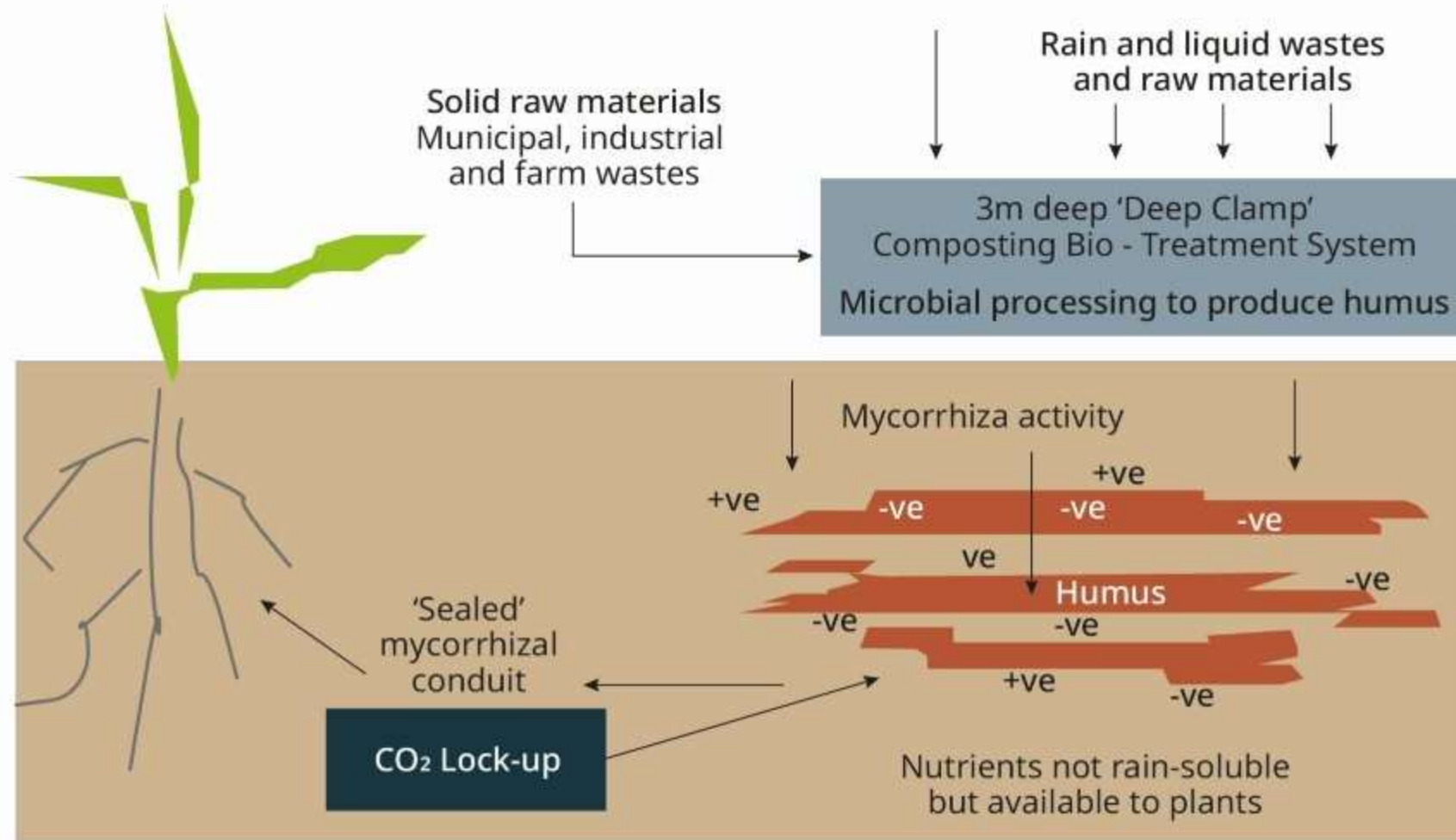
Further activity

We have carried out replicated plot trials at Niab Cambridge University.

We have started trial on adding to compost.

We are looking at how to manage these particles in a field situation.

Fig 1.1.9c How the plant feeds - from composted recycled resources ('wastes')



How the closed loop gives pollution control and scope for treatment systems.

Probability

We have a new, low energy-cost, safe, environmentally-friendly, Nitrogen fertiliser.

Possibilities

There is here a technical lead on managing microplastics.

We could, for example, manage waste-water from hospitals (which is high in microplastics and pharmaceutical residues, urinated out by patients).

To Do

We need enabling discussions with government.
We need to develop field knowledge.

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Series Editor: Uday Chatterjee

MYCORRHIZAE, MICROPLASTICS AND MONEY

WASTES AS A RESOURCE FOR FARMING AND FORESTRY
TO DELIVER REVERSAL OF GLOBAL WARMING



BILL BUTTERWORTH