CLIMATE CHANGE & BALTIC SEA

Saara Kankaanrinta
Co-Founder, Chair of the Board
BSAG Foundation

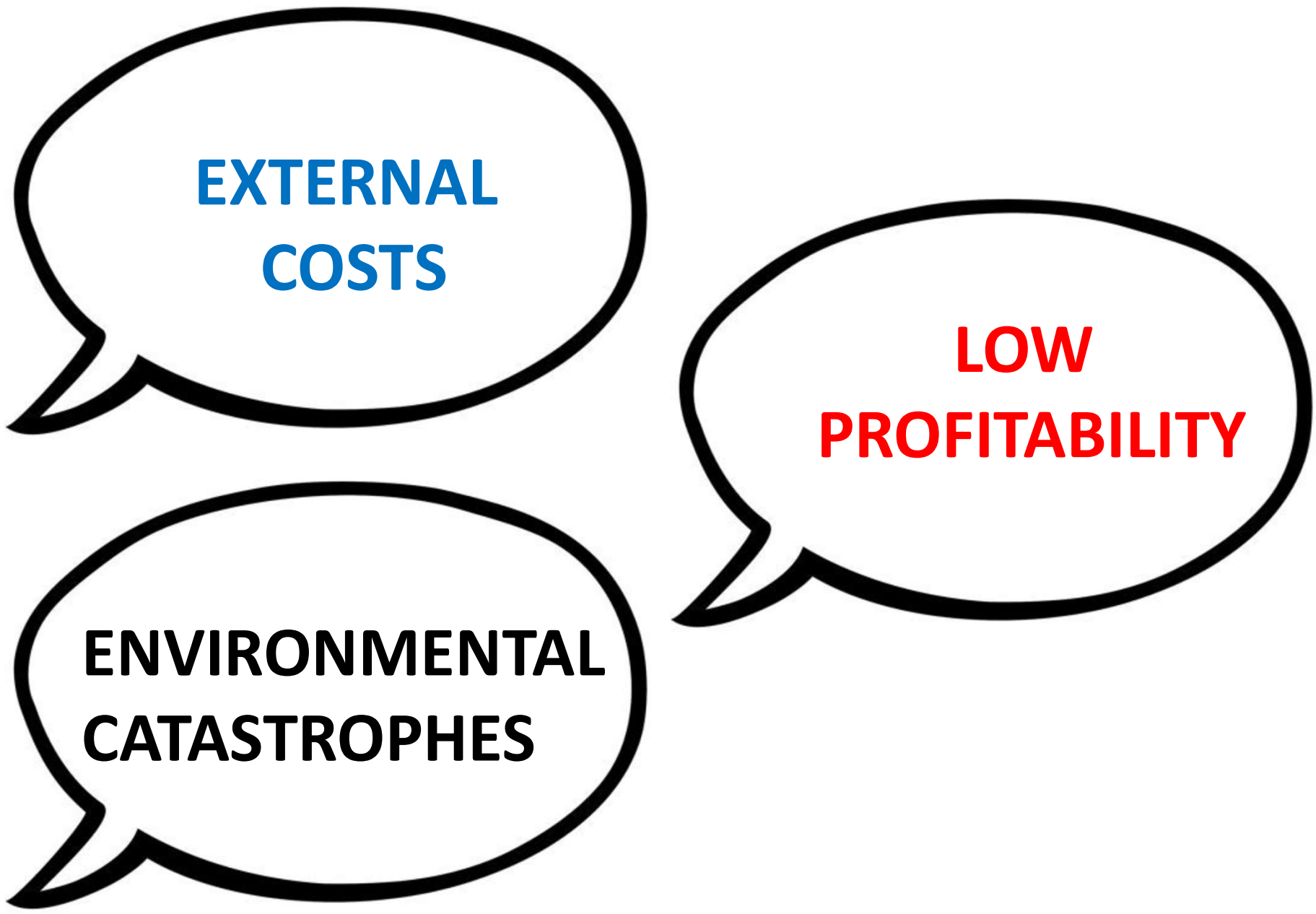
The Baltic Sea Action Group, BSAG (2008),
is an independent foundation that works to restore
the ecological balance of the Baltic Sea.

Unites resources of the public, private, and third sectors.
Internationally awarded for the novel concept.

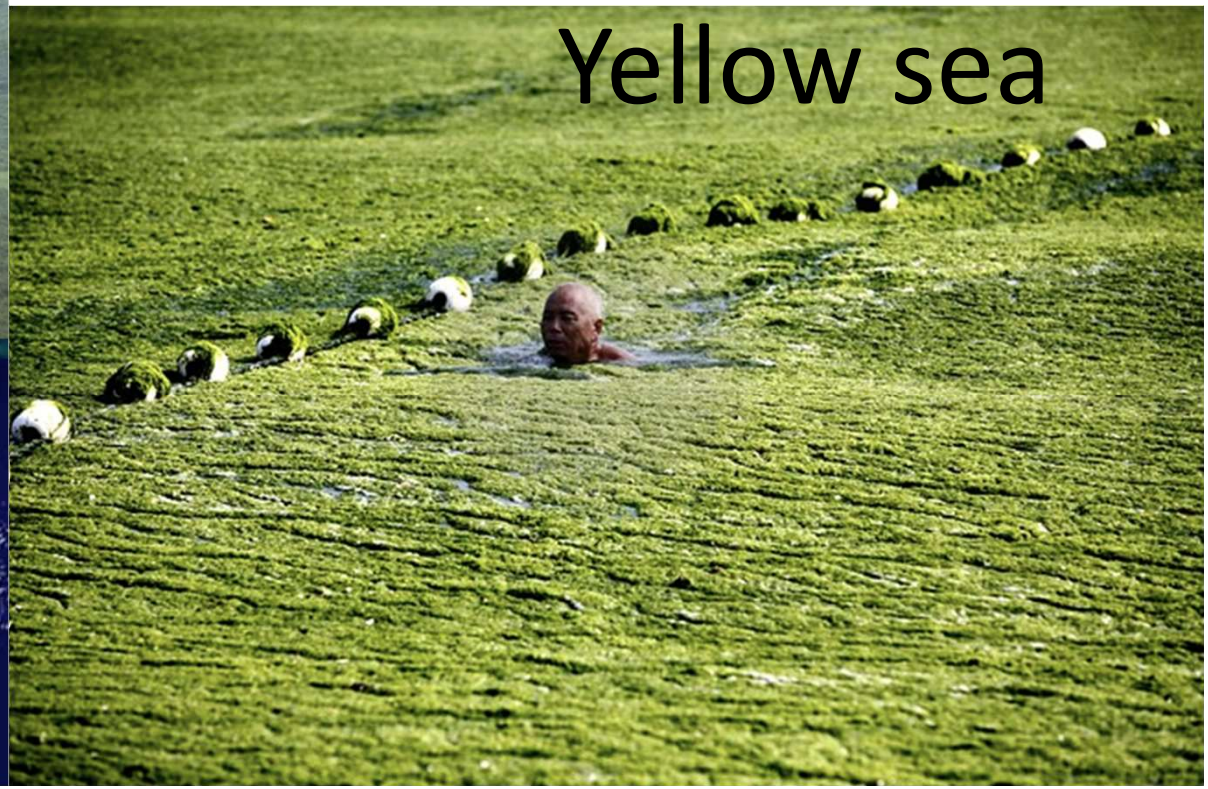
BSAG is based in Helsinki, and its' activities cover
the whole Baltic Sea region.

Baltic Sea,
Climate change,
global problems…

Let’s take a look at
the food chain.


EXTERNAL COSTS
LOW PROFITABILITY
ENVIRONMENTAL CATASTROPHES

Eutrophication



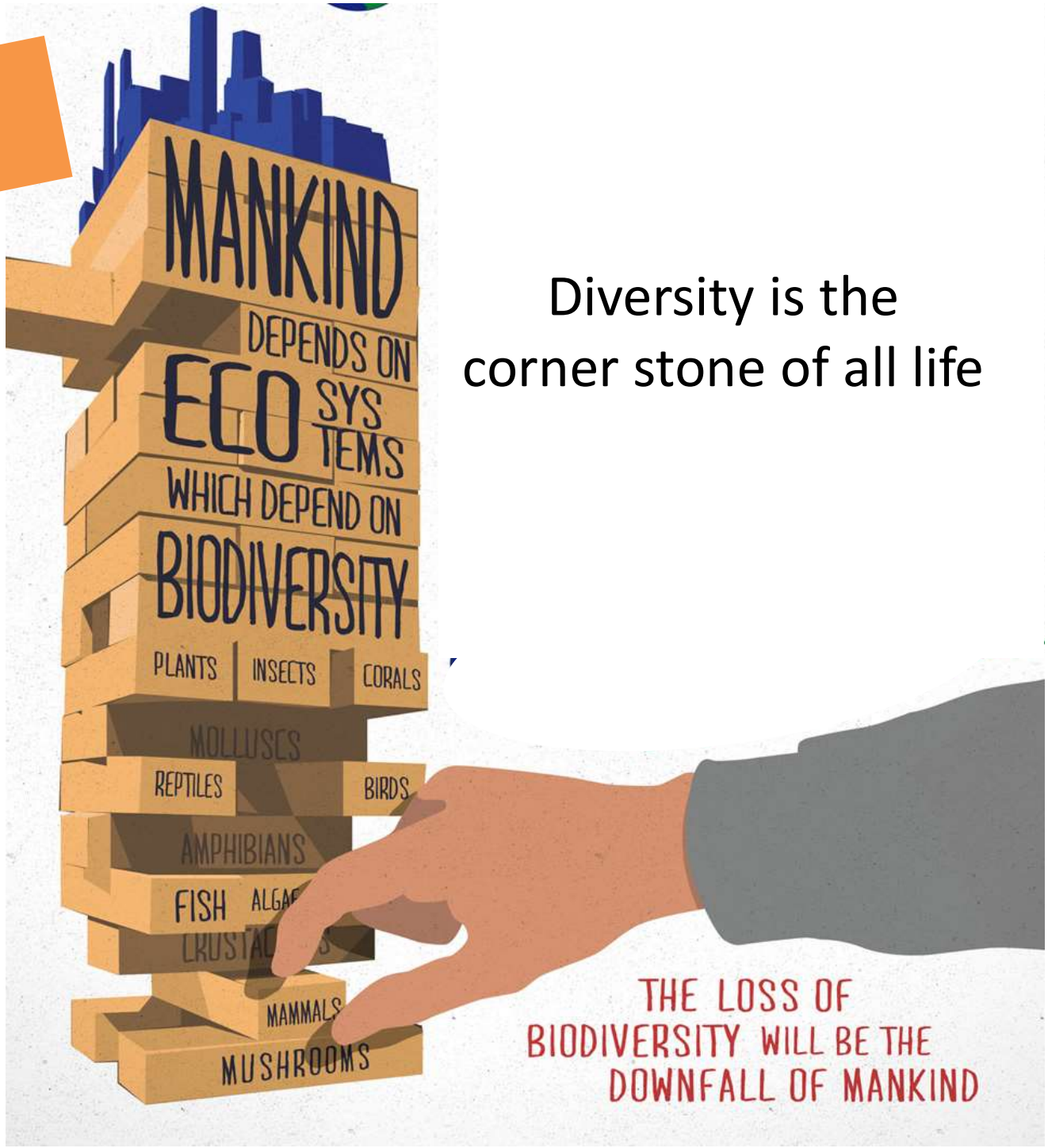

Soil: decreasing the carbon storage, not increasing it.
Forest & field:
-carbon balance
(2/3 underground)
-biodiversity

Loss of biodiversity

Industrial agriculture
100 yrs:

-75% crop diversity
-33% of all species

Loss of biodiversity



Diversity is the corner stone of all life

Environment

‘Shocking’ decline in birds across Europe due to pesticide use, say scientists

New figures reveal decline in farmland birds at a 'level approaching an ecological catastrophe'

Josh Gabbatiss Science Correspondent | @josh_gabbatiss | Wednesday 21 March 2018 18:57 | 35 comments

”suurin syy hyönteisten vähenevälle määrälle ovat tuholaismyrkyt. Ongelma korostuu silloin, kun laajalla alueella viljellään yhtä ja samaa viljelyskasvia”

”in 30 years amount of insects has declined 80%”

Piece of rain forest converts into finnish big?


Erosion

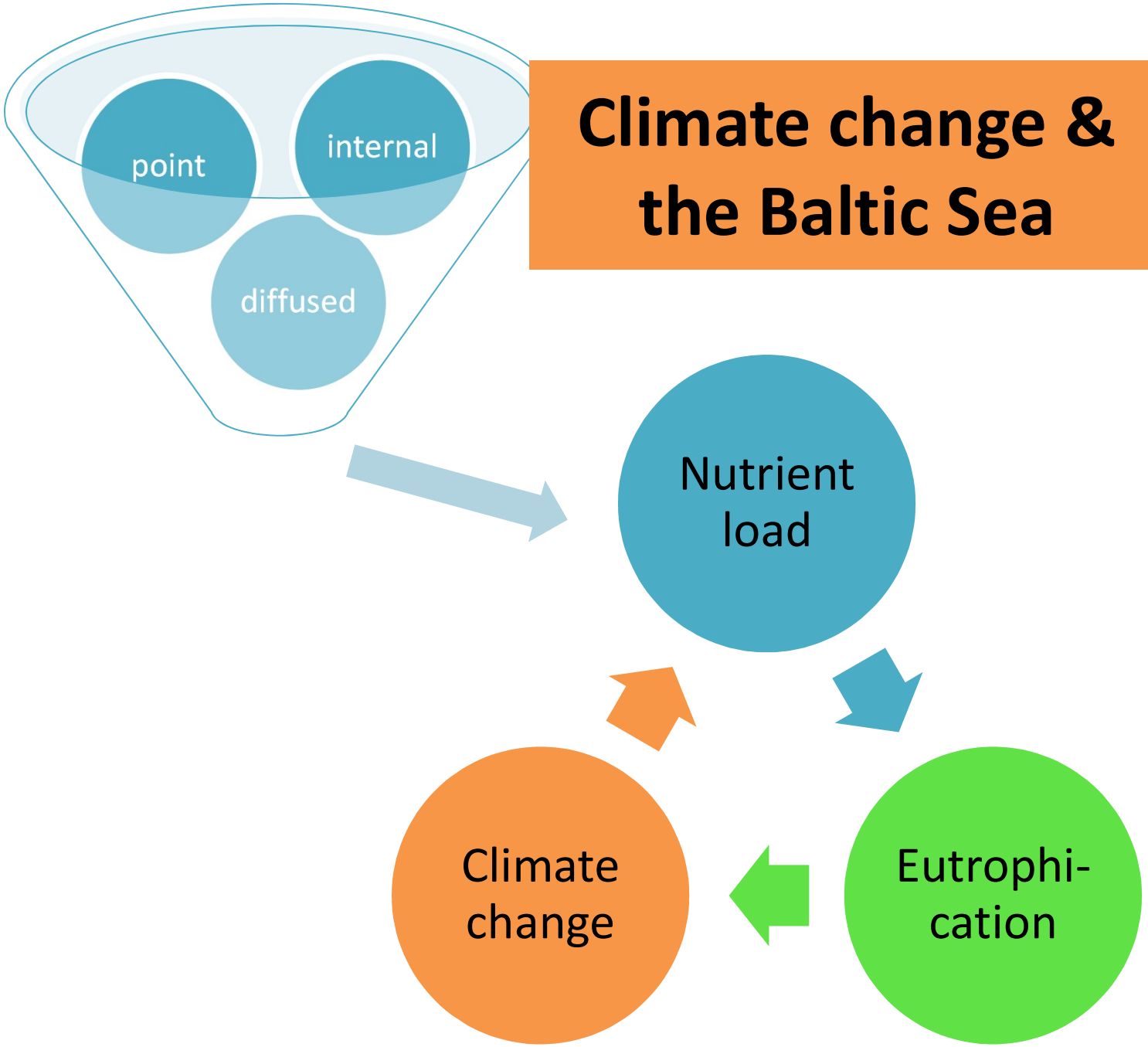
Climate change

Extreme weather, droughts, dryness
= hunger, poverty, conflicts, wars, refugees

Climate change & the Baltic Sea

More eutrophication, changes in flora and fauna, ecological imbalance

Climate change & the Baltic Sea



And this all we know very well.

What are the issues that we can not imagine at this moment?

We don’t know what we don’t know.

Or

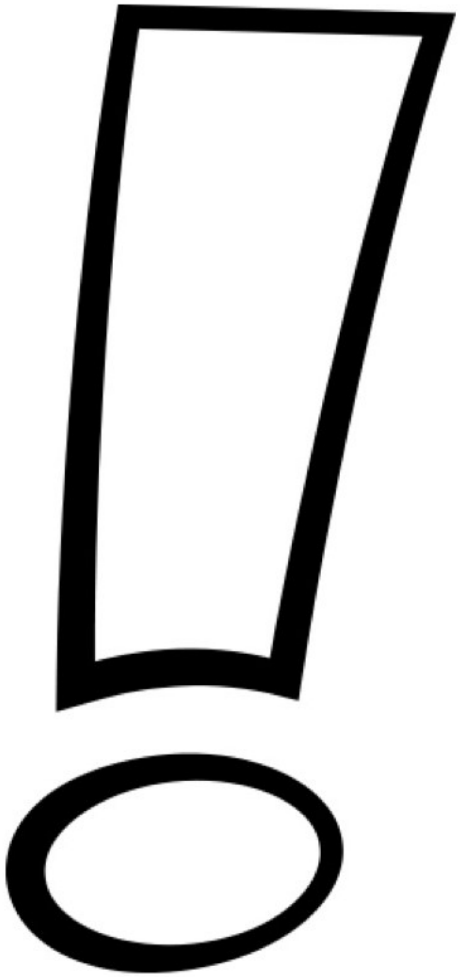
How fast we can make a change!


Healthy soil stores carbon and produces better yields – without emissions to the Baltic Sea

Farmer is not the problem but the solution – key is the SOIL

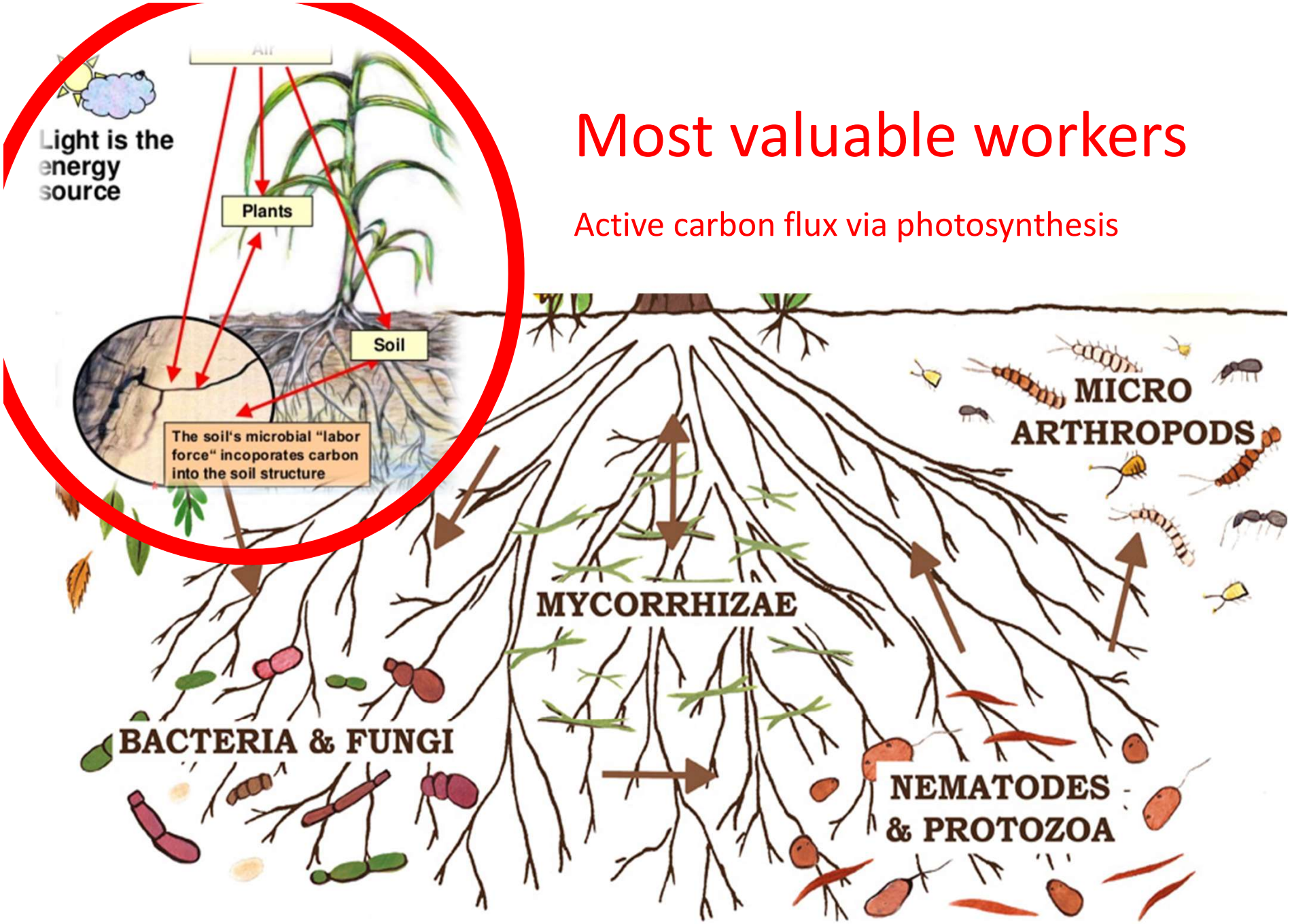
Soil carbon sequestration is the only known way to reverse climate change

Emissions from agriculture critical to the Baltic Sea

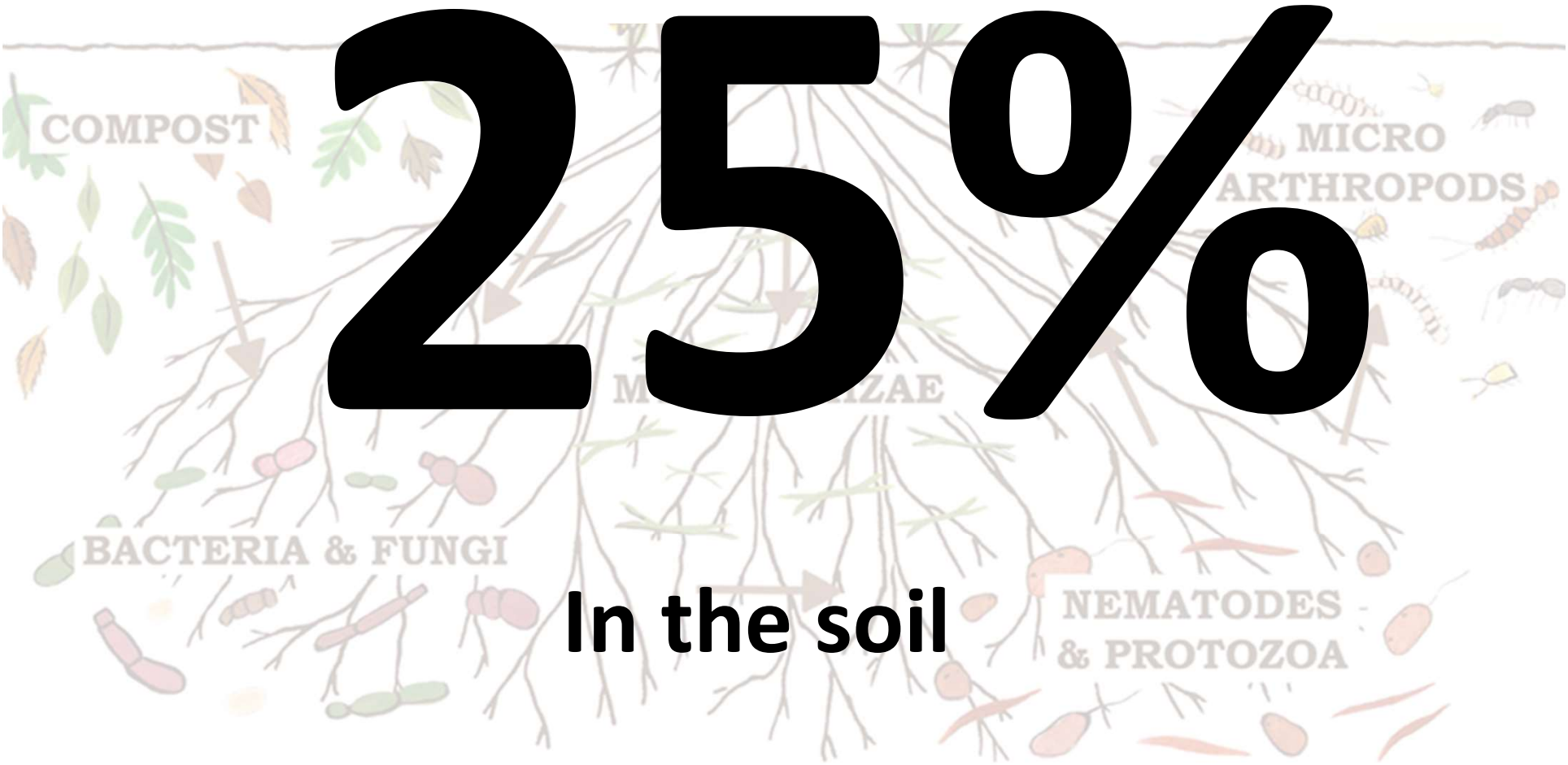


Most valuable workers

Active carbon flux via photosynthesis



Of all the world's biodiversity



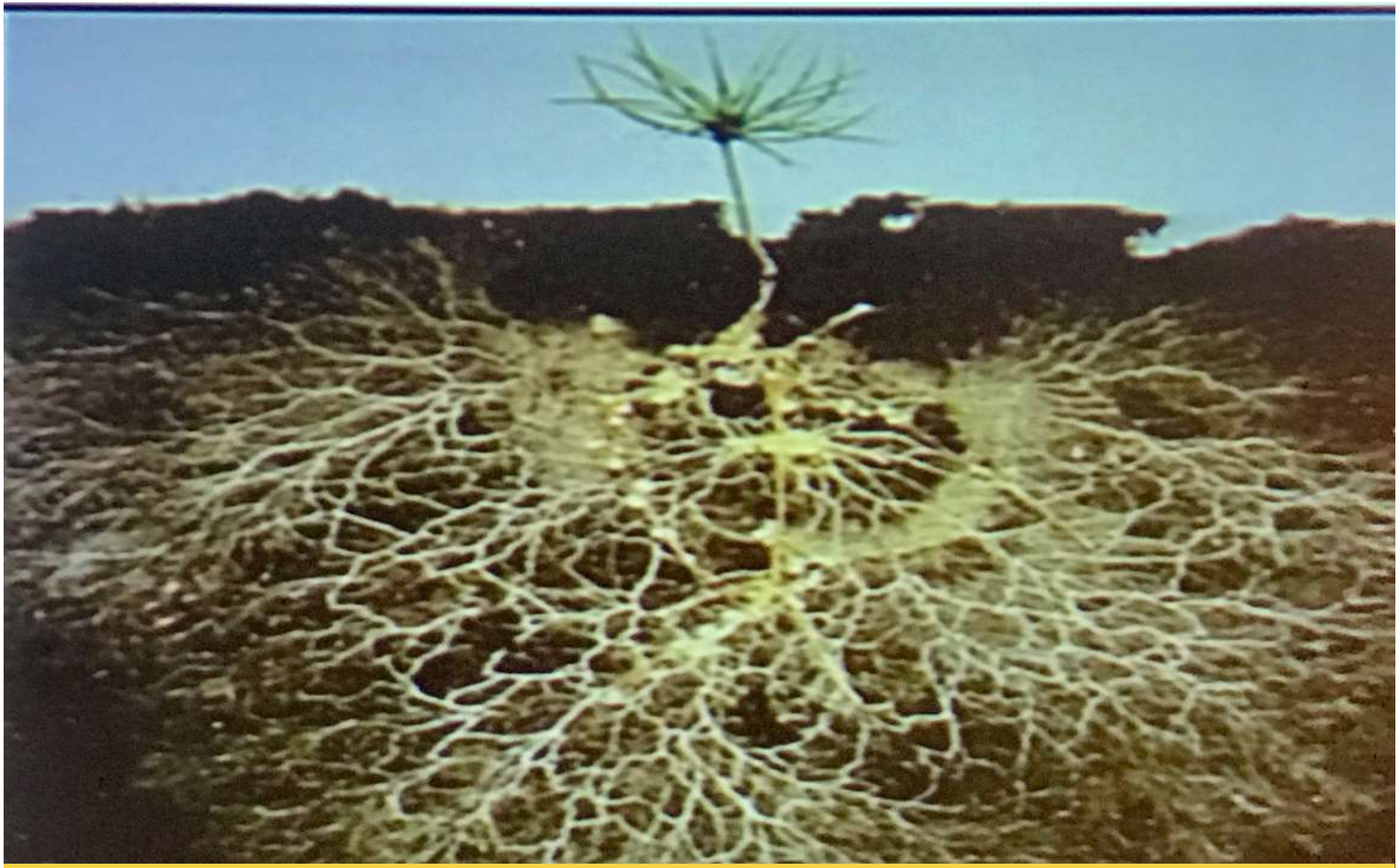
25%

In the soil

Soil at the moment: why does it NOT store carbon and why does it leak nutrients (emissions)?

-monoculture
-inorganic nutrients in fully available form
-plants are ”tube fed"
-tillage
-pesticides

Plant grows – soil weakens. We loose nutrients and the potential for carbon sequestration!



Chemical-physical-biological functions of soil
Mycorrhiza: underground internet and railroad

How to keep the soil in best condition?

1. Continous green - living plants, never bare soil


2. DIVERSITY – mimic the nature

How to keep the soil in best condition?

2. DIVERSITY!

First aid: gypsum, lime or wood fibres?

ALGER

Algkriget trappas upp – Sverige tror på kalk

Varsinais-Suomen pelloille levitettiin yli 6 000 tonnia jätekipsiä, ja tulokset ovat rohkaisevia – nyt kipsistä povataan jopa Itämeren pelastusta

Luke: Maanparannuskuitu vähentää valumia kipsiä tehokkaammin

What the soil needs:
Analysis -> prescription

Rakennekalkkia kun ph alhaalla

kipsiä kun ph ylhäällä mutta Ca alhaalla

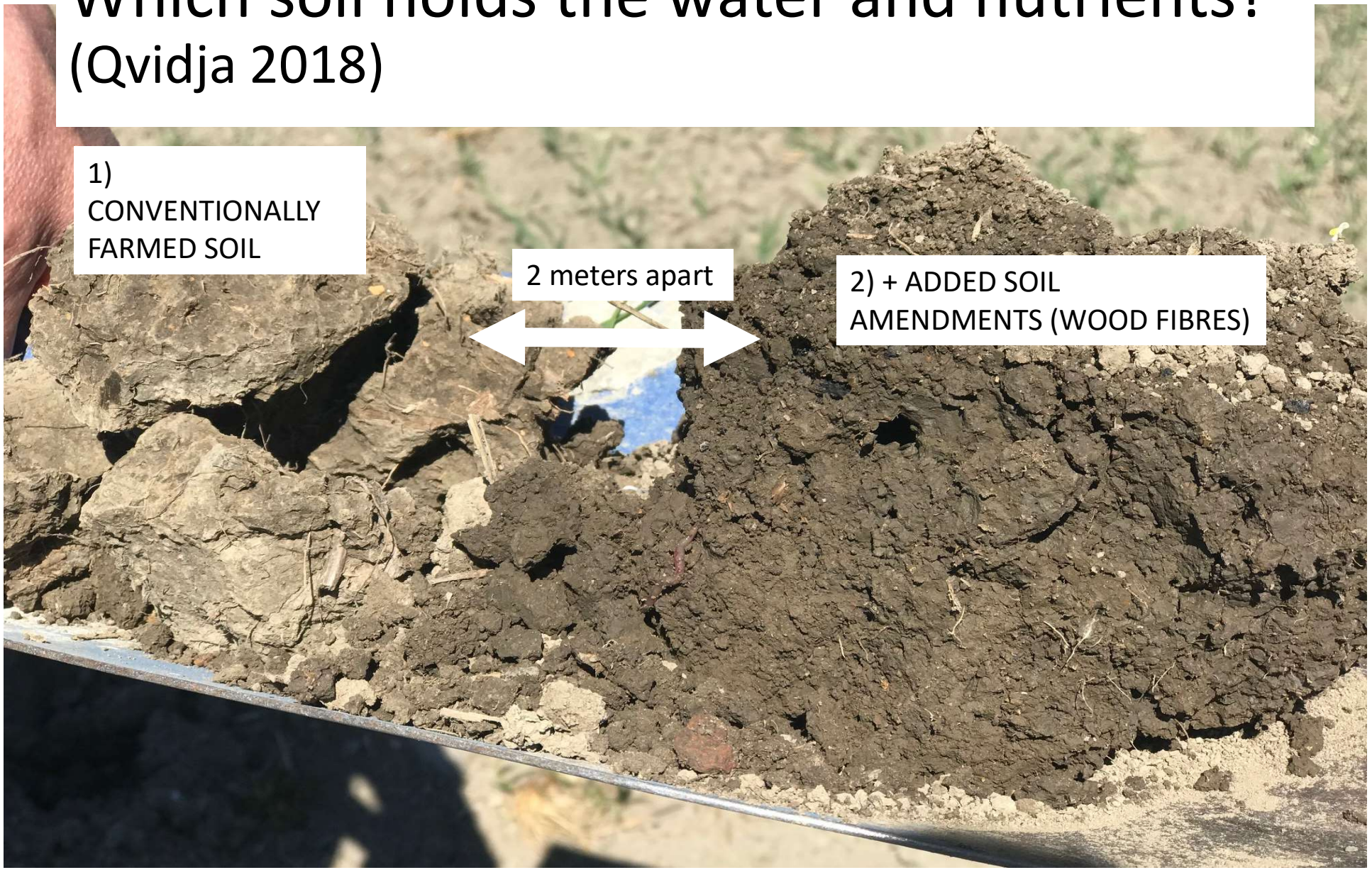
Jos kipsiä kun Ca valmiiksi korkealla, voi makrorakenne luhistua ja lisäksi muiden kationien (Kalium, magnesium, natrium) saatavuus kasville heikkenee.

Kuitu käy lähes aina, ja kuitua voi levittää lisäksi myös kipsin ja kalkin kanssa *(lisää tärkeää orgaanista ainetta – koti mikrobeille).*

2 %-units more organic matter…

doubles the water holding capasity

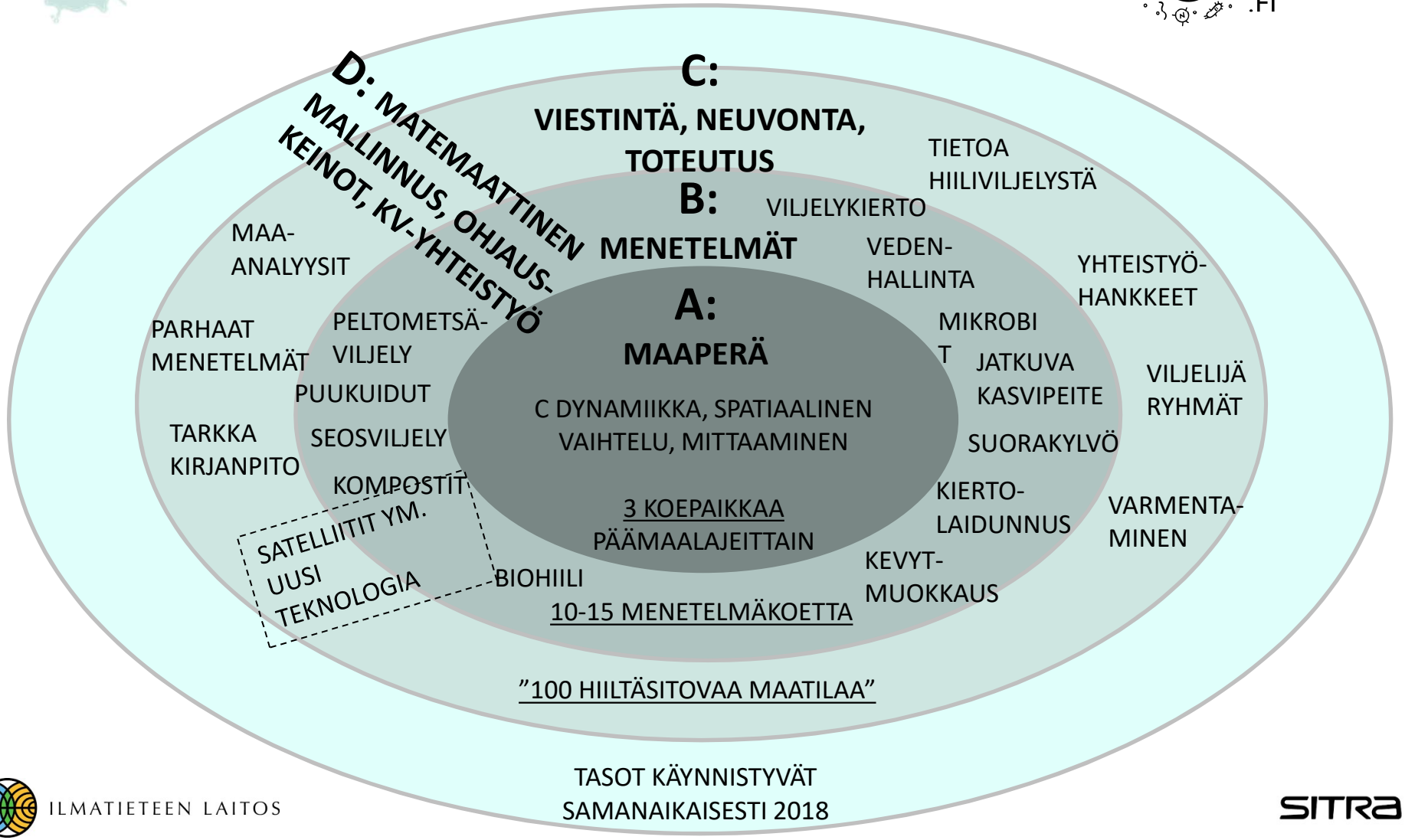
Which soil holds the water and nutrients?
(Qvidja 2018)



CARBON ACTION

CARBON ACTION

REVERSING CLIMATE CHANGE WITH
SOIL CARBON SEQUESTRATION



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CARBON ACTION .FI

ILMATIETEEN LAITOS

SITRA

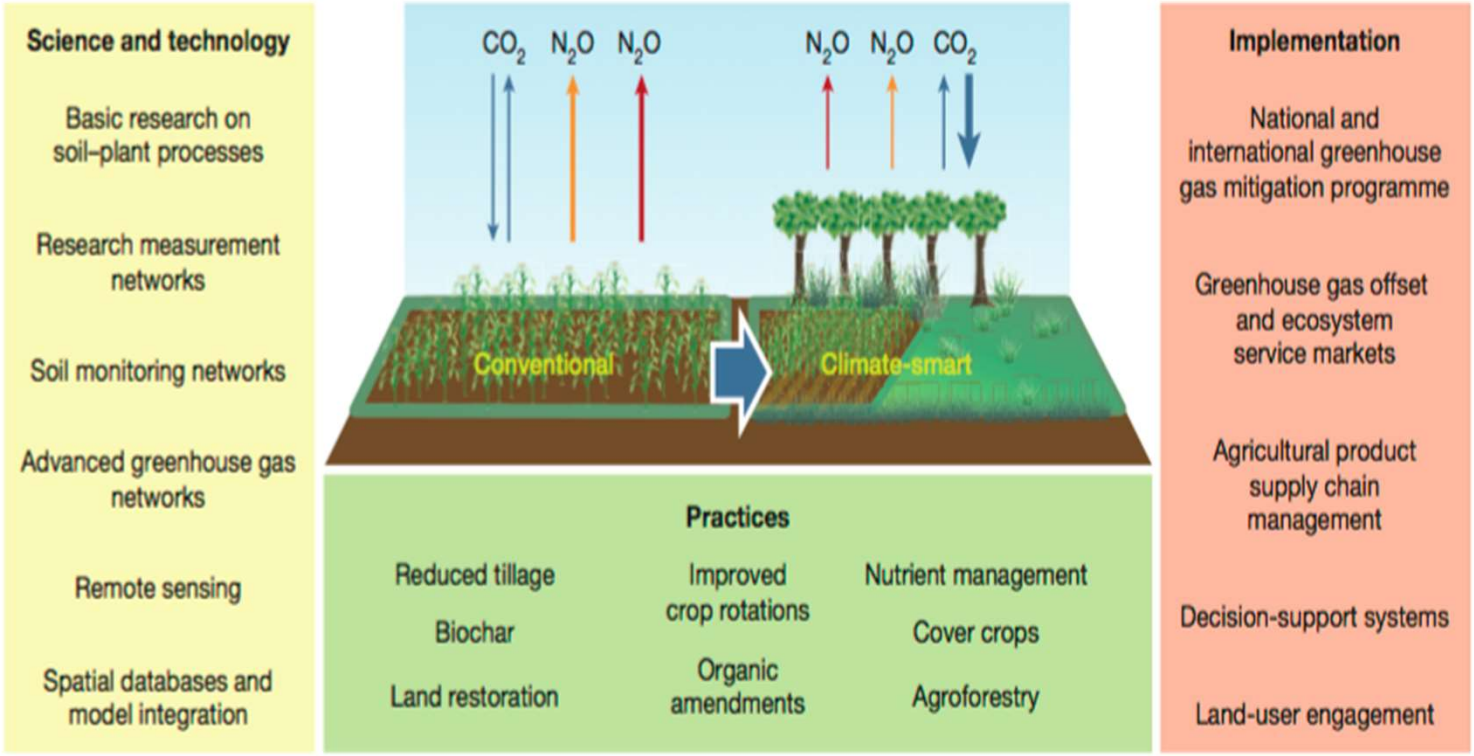
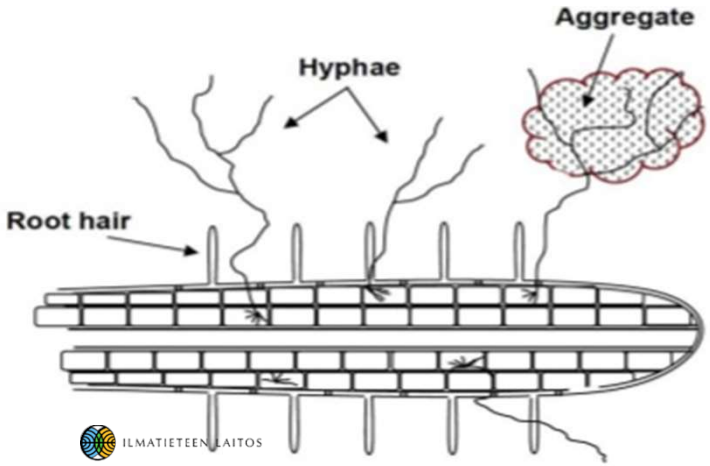
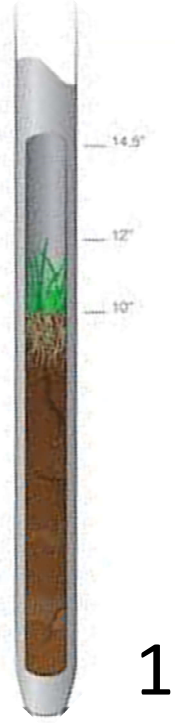


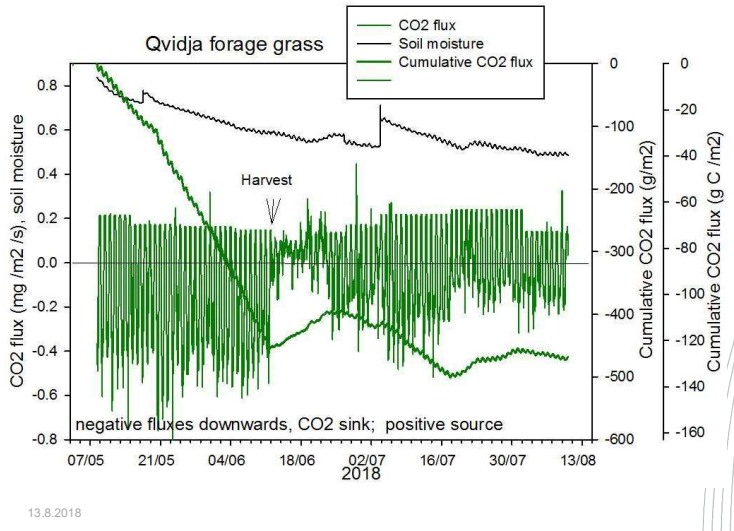
Figure 3 | Expanding the role of agricultural soil GHG mitigation will require an integrated research support and implementation platform. Targeted basic research on soil processes, expanding measurement and monitoring networks, and further developing global geospatial soils data can improve predictive models and reduce uncertainties. Ongoing advances in information technology and complex system and 'Big Data' integration offer the potential to engage a broad-range of stakeholders, including land managers, to 'crowd-source' local knowledge of agricultural management practices through web-based computer and mobile apps, and help drive advanced model-based GHG metrics. This will facilitate the implementation of climate-smart soil management policies, via cap-and-trade systems, product supply-chain initiatives for 'low-carbon' consumer products, and national and international GHG mitigation policies; it will also promote more sustainable and climate-resilient agricultural systems, globally.

Keith Paustian et al (Nature). Prof. Paustian is a member of the projects advisory group

CARBON ACTION





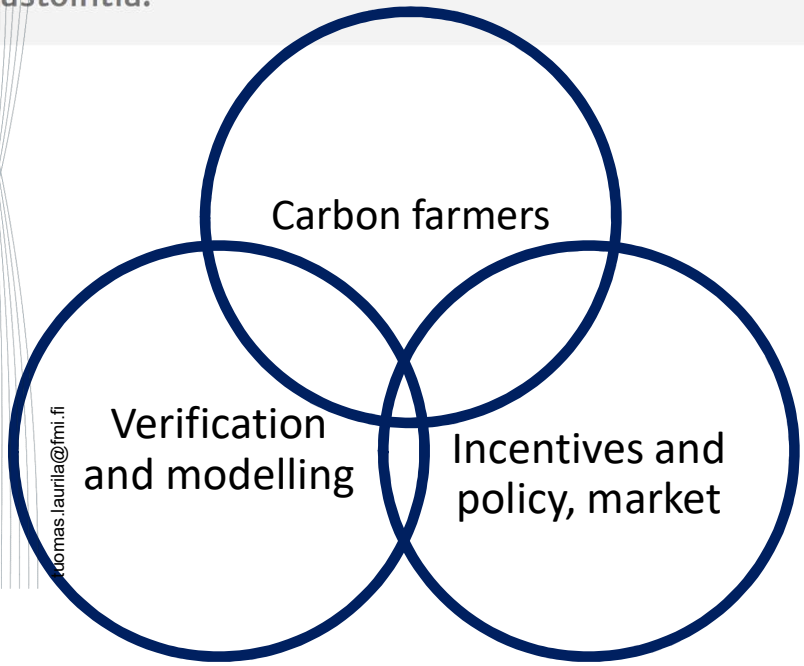


1m

Viljelijät lähtivät innolla mukaan: Ainutlaatuinen hanke selvittää hiilen varastointia maaperään

MT PLUS Maatalous 26.07.2018 HÄMEENLINNA
Juhani Reku

Yhteensä sata viljelijää osallistuu omilla pelloillaan tutkimukseen, jonka tavoitteena on tehostaa hiilen varastointia.



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- SCIENCE – FARMERS – POLICY

1) find ways the carbon is most permanently stored to the soil
2) find out which agricultural practices speed up the carbon sequestration
3) find out how science can verify the changes in carbon storage
4) Gather critical mass of farmers to create a movement of regenerative agriculture
5) Develop incentives and policy to speed up the implementation of regenerative agriculture

I look forward to following up with the Finnish team

The health of soil, plants, animals, people and ecosystems is one and indivisible. Soil organic carbon is the strong determinant of the soil health. Thus, the Finnish initiative on soil carbon sequestration has a highly needed holistic concept. We need to engage scientists, farmers, consumers and governments to the work. The potential of soil has not yet been discovered. I am happy to be part of the global network working together, and look forward to following up with the Finnish team.

Dr. Rattan Lal

The Ohio State University. Carbon Management and Sequestration Center, USA 2007 Nobel Peace Prize winner as part of IPCC, 2007

The approach of the BSAG Foundation and the project is ground-breaking

Transformational change in agriculture will require a combined approach based on the integration - in space and time - of science and farmer training. The restoration of healthy living soils, clean air, clean water and the production of nutrient dense food is essential to our quality of life. We need to acknowledge the roles of photosynthesis, liquid carbon, the soil microbiome and above and below-ground biological diversity in soil building and landscape function. The approach of the BSAG Foundation in bringing these diverse aspects together in the one project is ground-breaking.

Dr. Christine Jones

Amazing Carbon


Healthy soil stores carbon and produces better yields – without emissions to the Baltic Sea