Hemp4Soil

Community Soil Biodiversity Project

HEMP4SOIL is an EIP (European Innovation Partnership) project being administered by Loop Head Together. The Project is funded by the EU Recovery Instrument Funding under the Rural Development Programme 2014-2022”

An Roinn Talmhaíochta, Bia agus Mara
Department of Agriculture, Food and the Marine

The European Agricultural Fund for Rural Development: Europe investing in rural areas

Loop Head Peninsula,

A regenerative community!

- **Loop Head listed on world's Top 100 sustainable destinations,** First Irish Destination to receive the award!
- **Innovative forward thinking community,**
- **Farming** and **Tourism** are the backbone of the economy.
- Clare County Council chosen **Decarbonising Zone**

Loop Head Together:

A grassroots initiative supported by 40 local community groups to find solutions address the issue of resident numbers in steady decline.

How do we future proof our farms?

Loop Head Peninsula Together

Www.LoopHeadTogether.ie

2030 Targets for sustainable food production

PESTICIDES

Reduce the overall use and risk of chemical and hazardous pesticides

NUTRIENT LOSSES

Reduce nutrient losses by 50% whilst retaining soil fertility, resulting in 20% less fertilisers

ANTIMICROBIALS

Reduce sales of antimicrobials for farmed animals and aquaculture

ORGANIC FARMING

Increase the percentage of organically farmed land in the EU

#EUFarm2Fork #EUGreenDeal

How?

European Commission

What is Hemp4Soil EIP!

- Community Driven:
- 10 Farmers from the Loop Head Peninsula
- 10 Acres of land will be used in the experiment.

Hemp4Soil is looking at how **regenerative farming** methods and **hemp cultivation** along with a suite of soil analysis could provide quantifiable improvements to soil health. The project also looks at farm diversification and decarbonising.

Operational Group: Community led Innovation

Operational Group	Description	Stakeholder
Laura Jayne Foley MSc	Manager	Loop Head Together
Carsten Krieger (An Taisce)	Climate Ambassador	An Taisce/Loop Head Together
Dr. Kate Randall	Microbial Ecologist	University of Essex
Dominic O'Shea	Farmer Representative	Loop Head Together
Liz Greehy	Communications	Loop Head Together
Dr. Lena Madden	Microbiologist	TUS
Dr Robert Johnston	Carbon and Biochar	Hemp Cooperative
Margaret Cotter	Rural & Community Development	Clare County Council
Tony Collins	Community Engagement	Loop Head Together

Laura Jayne Foley : Project Manager: Hemp4Soil EIP

- **Board Member of Hemp Cooperative Ireland**
- **Member of Loop Head Together Community Group**
- **Wild Atlantic Hemp,** growing Hemp on the Loop Head Peninsula since 2018

Our approach is regenerative!!

- Increase: Organic Carbon of Soil:
- Increase: Microbial Life of Soil:
- Remove: Remediate the soil
- Quantify: Soil Testing TUS/UCD

The Three SuperHeros:

- Biochar
- Slurry

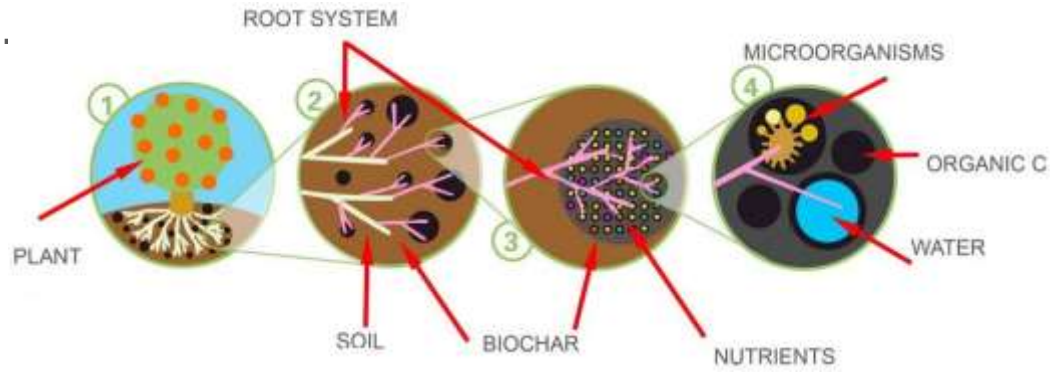
  Why?
- Hemp

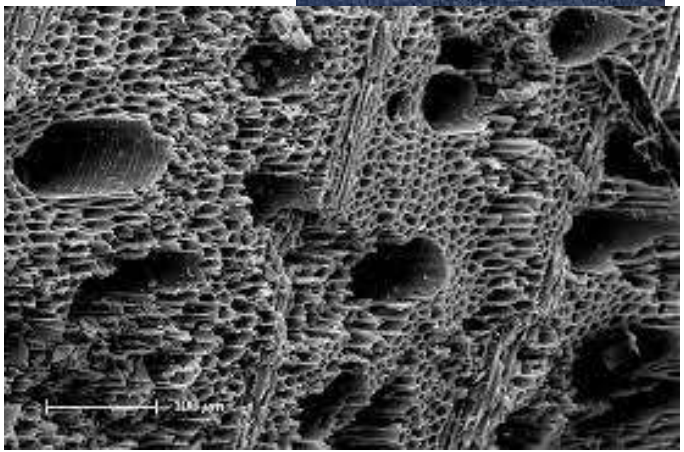
Why Biochar? Biochar is Carbon: Similar to Charcoal

Benefit to the soil: Habitat for Microbes

Benefit to Environment: Sequesters Carbon

Benefit to Farmers: Improves growing conditions without the need for expensive artificial fertiliser





Why Slurry & BioChar Mix?

Benefit to the soil: Providing an alternative to artificial fertiliser

Benefit to Environment: Reduction of leaching of slurry into groundwater:

Benefit to Farmers:

Slurry in plentiful supply on local Dairy farms.

Increases the retention of nutrients in the soil

Biochar Reduces the smell from Slurry

Why Hemp:

Benefit to the soil: Hemp cleans the soil: Phyto-remedial

Benefit to Environment:

Hemp Sequesters a huge about of carbon in 110 days.

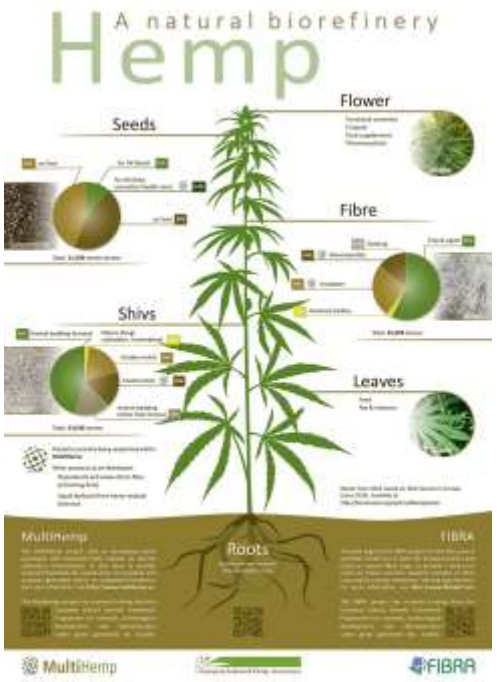
Hemp is an excellent source of nutrition for insects and birds. (GLAS)

Benefit to Farmers:

Excellent rotational crop. (90-110 growing cycle)

Opportunities for farm diversification and Carbon abatement .

Real opportunity for Farmers to drive Carbon ZERO on their farms



Phase 2: Exploring Circular Carbon to reach carbon zero community

Making Biochar from the Hemp Grown in the community.

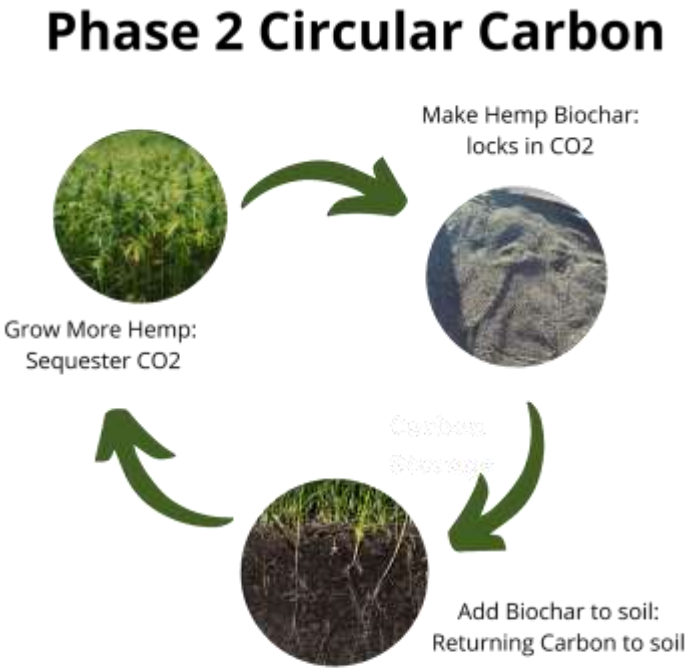
A Successful Outcome:

Replace expensive artificial fertilizer imports:

Valorising waste within the community to enrich the soil:

Creating new markets for farmers:seed, biochar, carbon credits

Achieve status of first carbon zero community using our regional strengths.



Kate Randall
Molecular Microbial Ecologist

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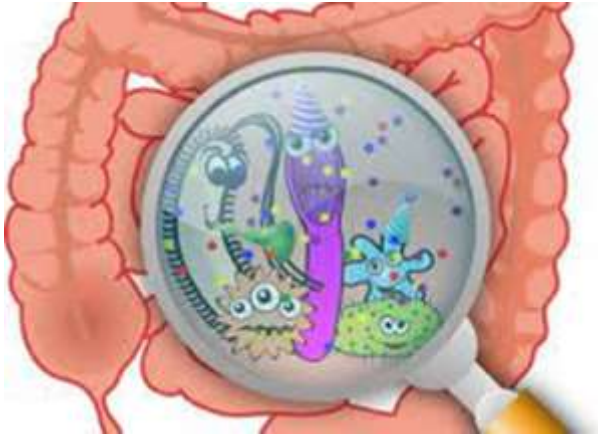
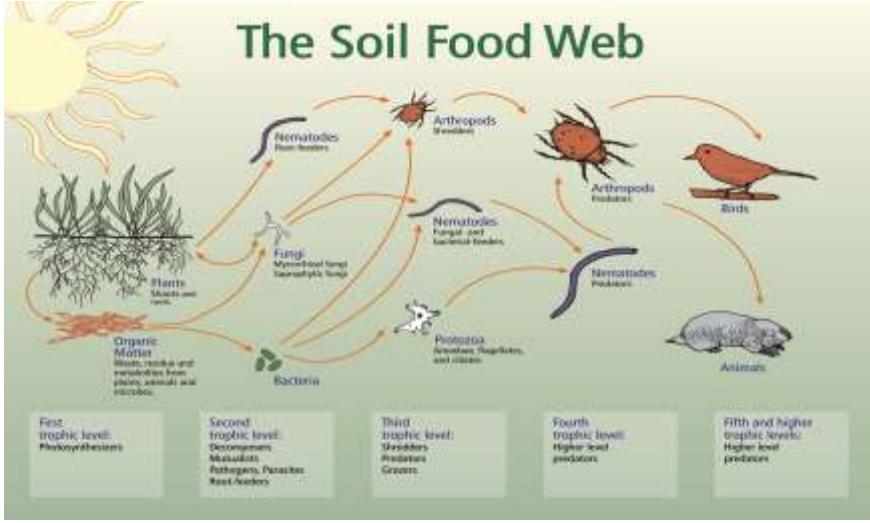
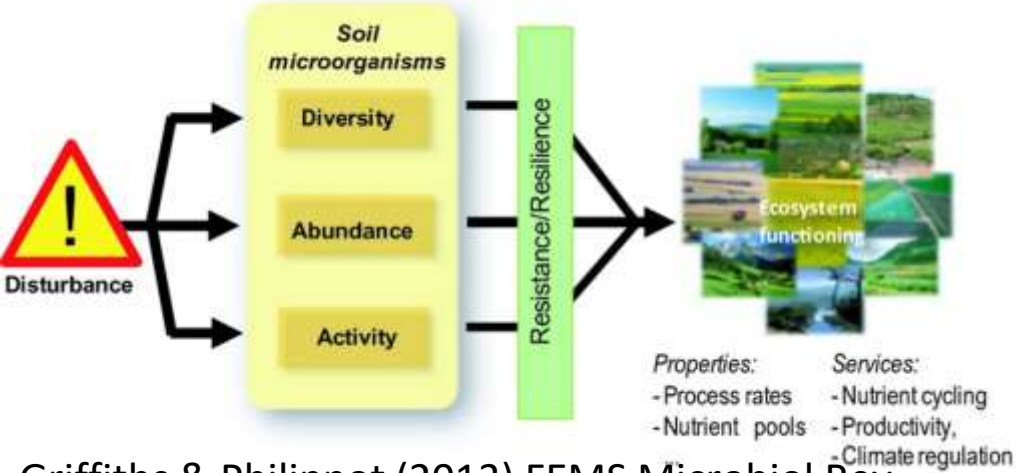
@Randall_K_C

Why are microbes important?

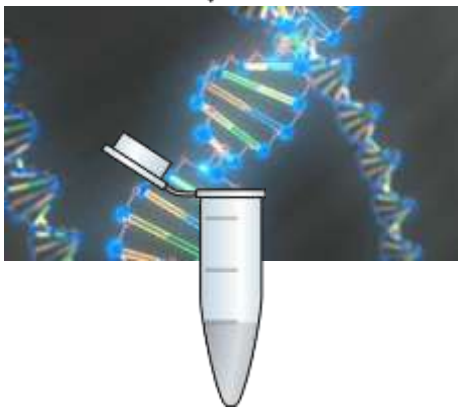




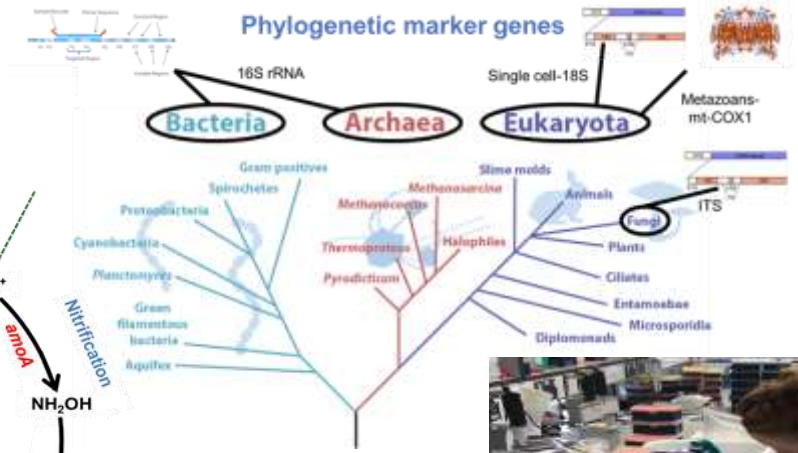


Griffiths & Philippot (2013) FEMS Microbiol Rev

Molecular tools to study microbial ecology



Who?
Where?
When?
How much?
What roles?



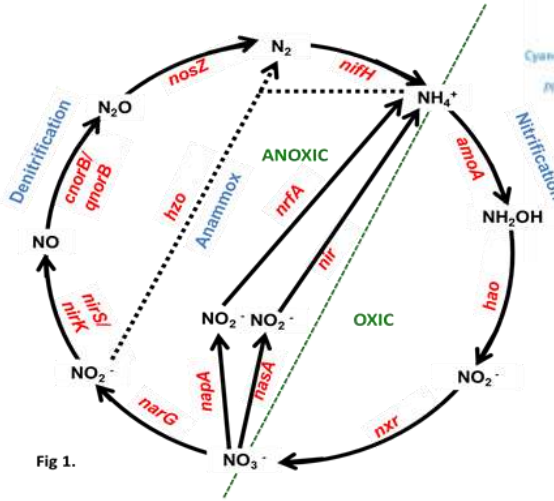


Fig 1.

Why am I involved?

UCD Earth Institute

Better understand today's world.
Inform solutions for tomorrow.

eagasc

Agriculture and Food Development Authority

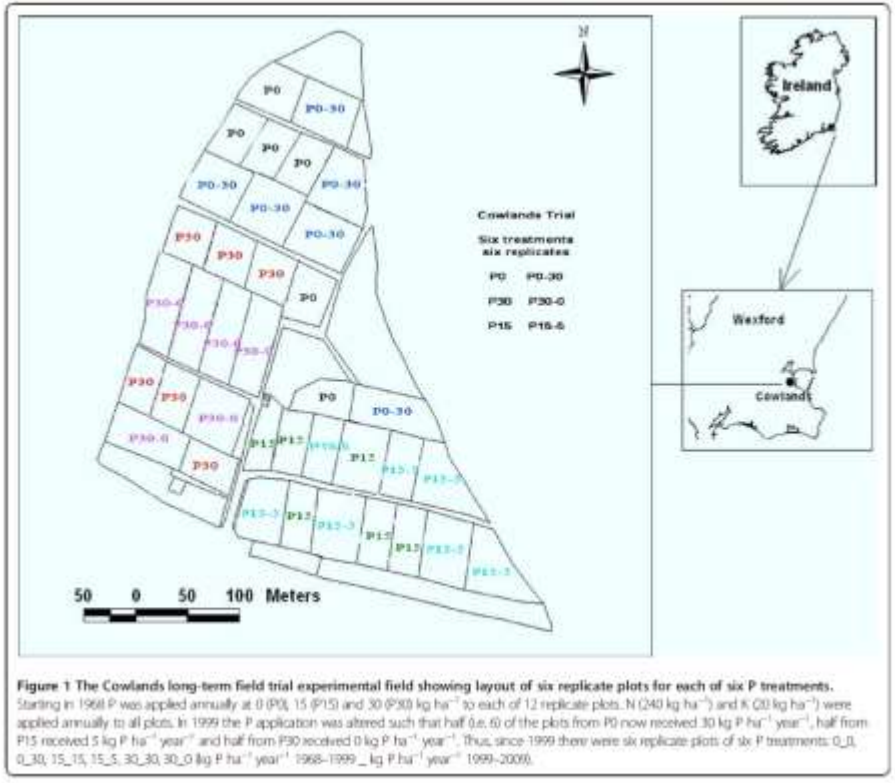
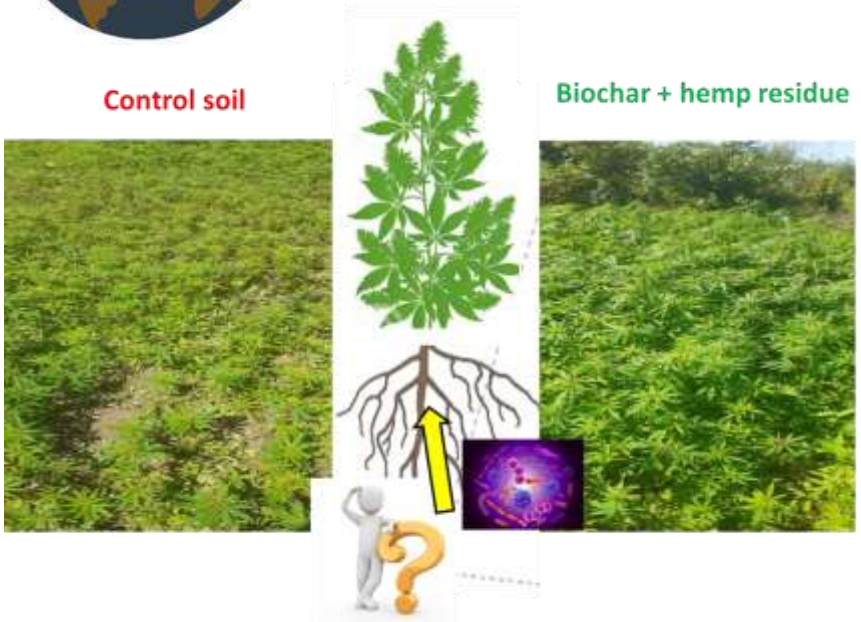
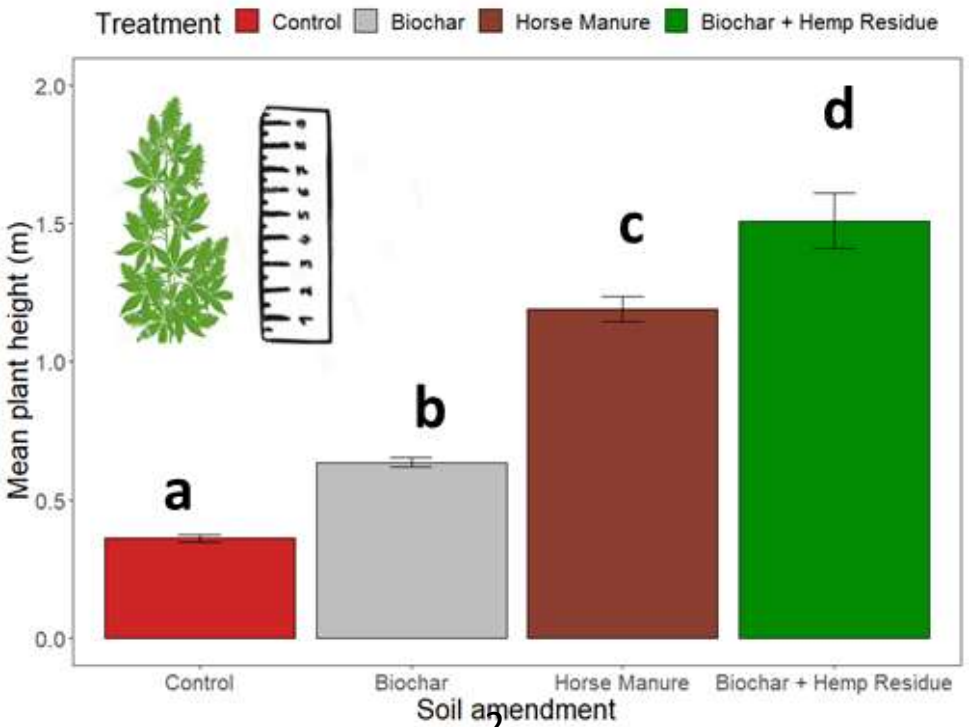


Figure 1 The Cowlands long-term field trial experimental field showing layout of six replicate plots for each of six P treatments. Starting in 1968 P was applied annually at 0 (P0), 15 (P15) and 30 (P30) kg ha^{-1} to each of 12 replicate plots. N (240 kg ha^{-1}) and K (83 kg ha^{-1}) were applied annually to all plots. In 1999 the P application was altered such that half (i.e. 6) of the plots from P0 now received 30 kg P ha^{-1} year^{-1}, half from P15 received 5 kg P ha^{-1} year^{-1} and half from P30 received 0 kg P ha^{-1} year^{-1}. Thus, since 1999 there were six replicate plots of six P treatments: 0_0, 0_30, 15_15, 15_5, 30_30, 30_0 (kg P ha^{-1} year^{-1} 1968–1999 _ kg P ha^{-1} year^{-1} 1999–2009).

Griffiths et al., (2012) Ecol Processes

Project origins and preliminary data 2021

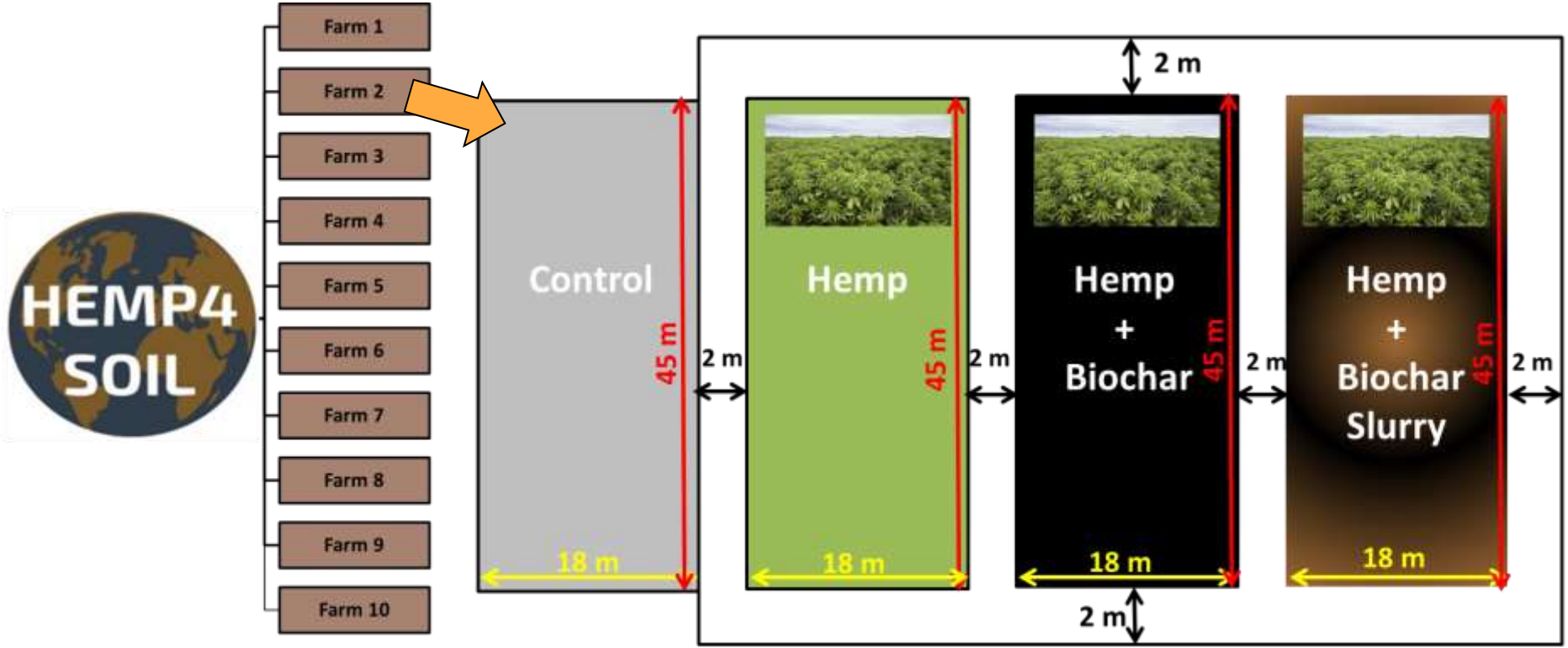




Treatments ($X^2_{(3)}$=629.07, p<0.001)

Experimental design

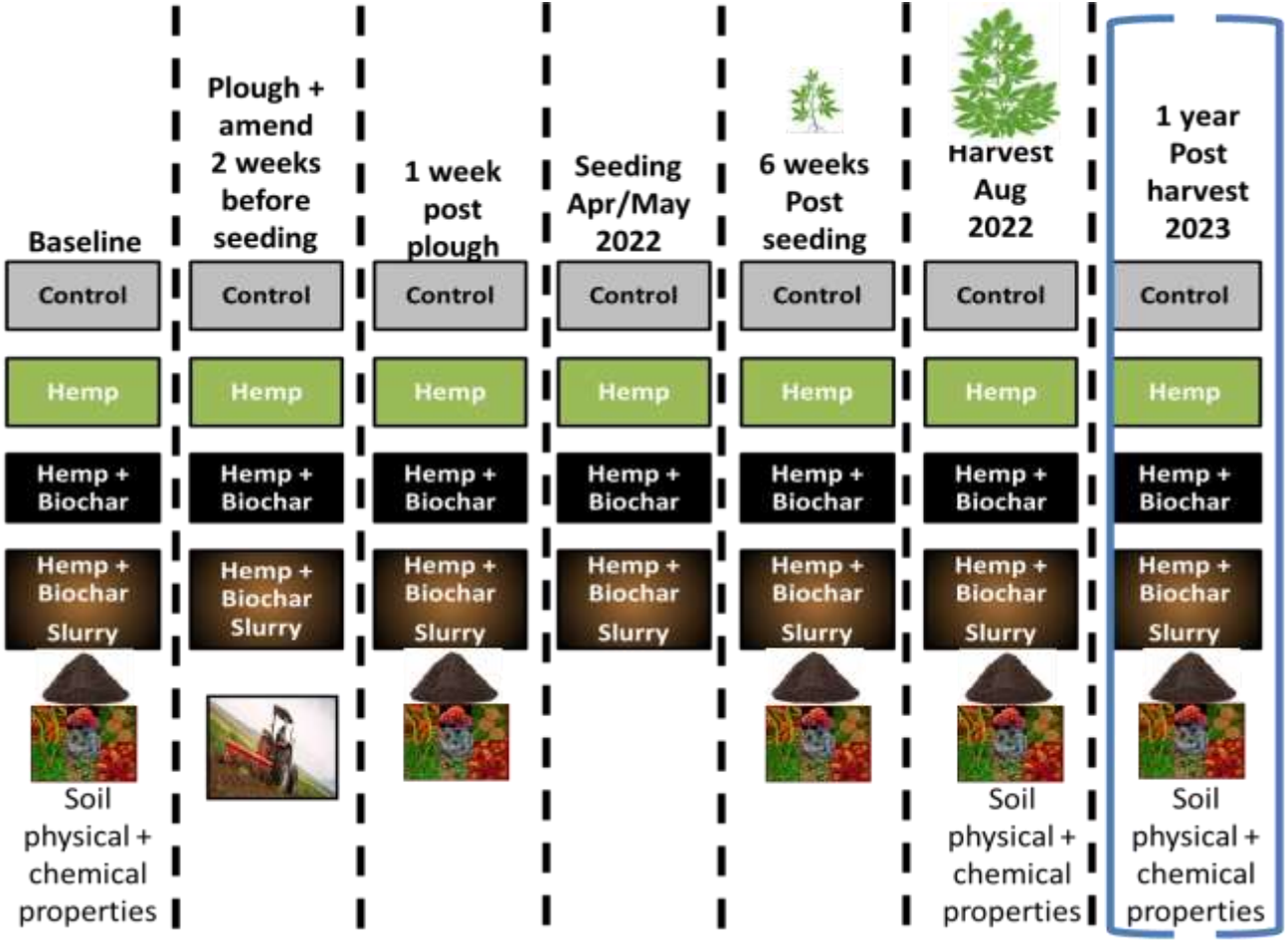
- 10 farms across Loop Head (non-intensive land)



Experimental optimisation

- Futura75 – fibre crop (12.5 kg / acre)
- Slurry – surplus in West Clare (2000 gallons / acre)
- Biochar – Arigna Fuels (1 T /acre)

Sampling Protocol

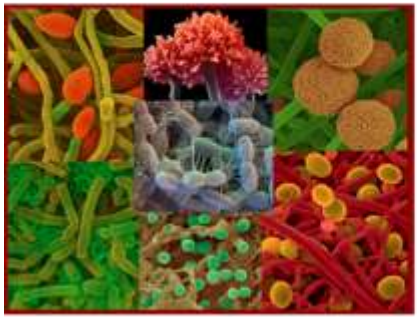


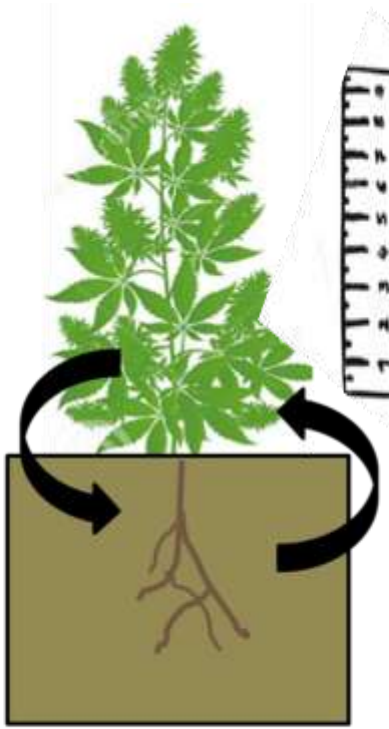
University of Essex

UCD DUBLIN

TUS

Measurements to be made





Research goals

1) Can we demonstrate improvement in soil health due to organic amendments?

1) Do soil organic amendments influence hemp productivity?

1) Does organically grown hemp influence soil properties?

1) Characterise and quantify the hemp-soil microbiome?

1) Can we demonstrate hemp phytoremediation?

1) What are the costs associated with growing hemp for fibre?

Thank you to our project supporters

- Loop Head Together
- Carrigaholt Development Association
- Hemp Cooperative Ireland
- Irish WildLife Trust
- TUS/UCD/ University of Essex
- Teagasc
- An Taisce
- Arigna Fuels/Wild Atlantic Hemp
- Clare County Council
- Dep. of Agriculture Forestry & Marine

https://www.loopheadtogether.ie/