

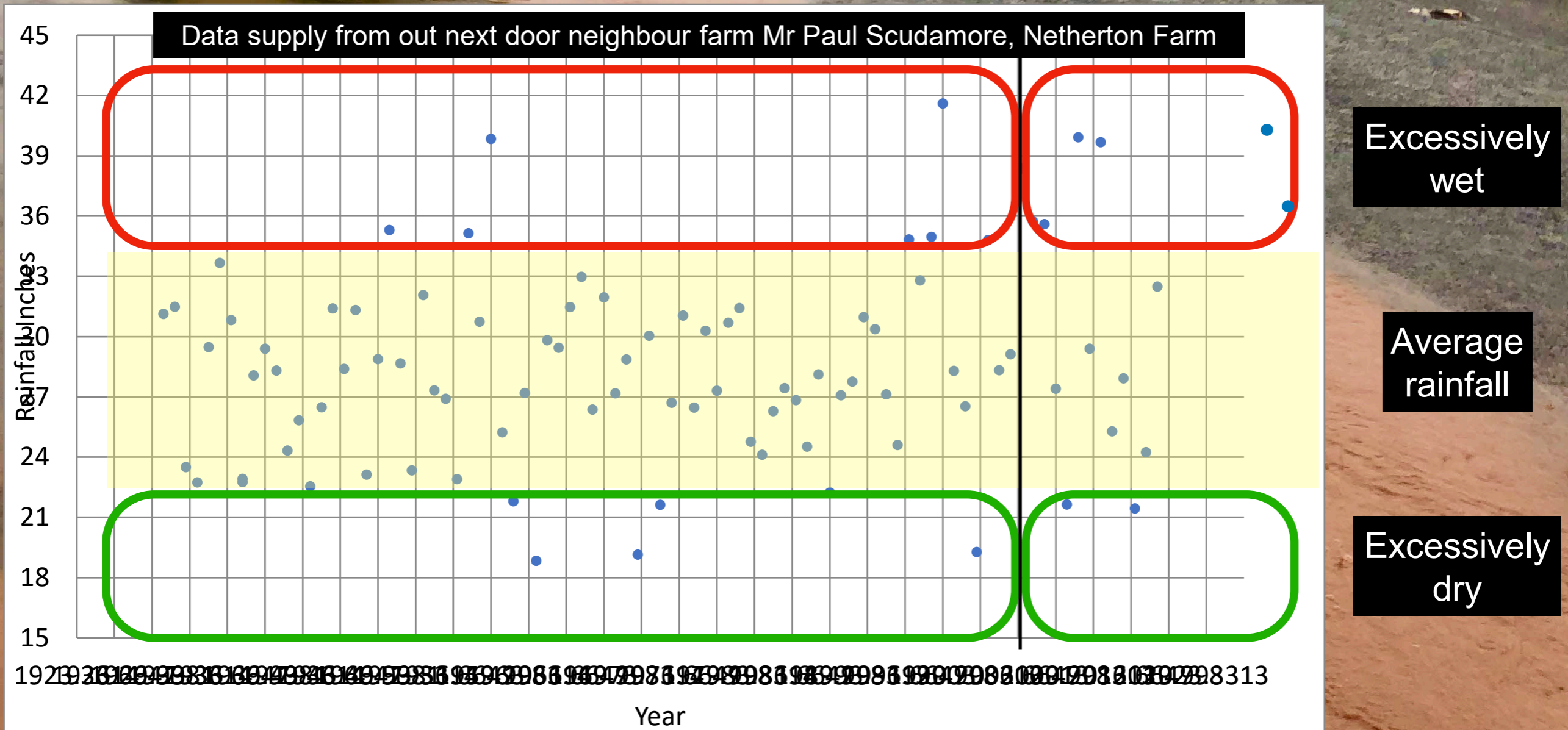
# Townsend Farm

Regenerative agriculture approach

Returning intimacy to farms



# Rainfall extremes and climate change



There are more weather extremes in the past 22 years than there were in the previous 70 years!

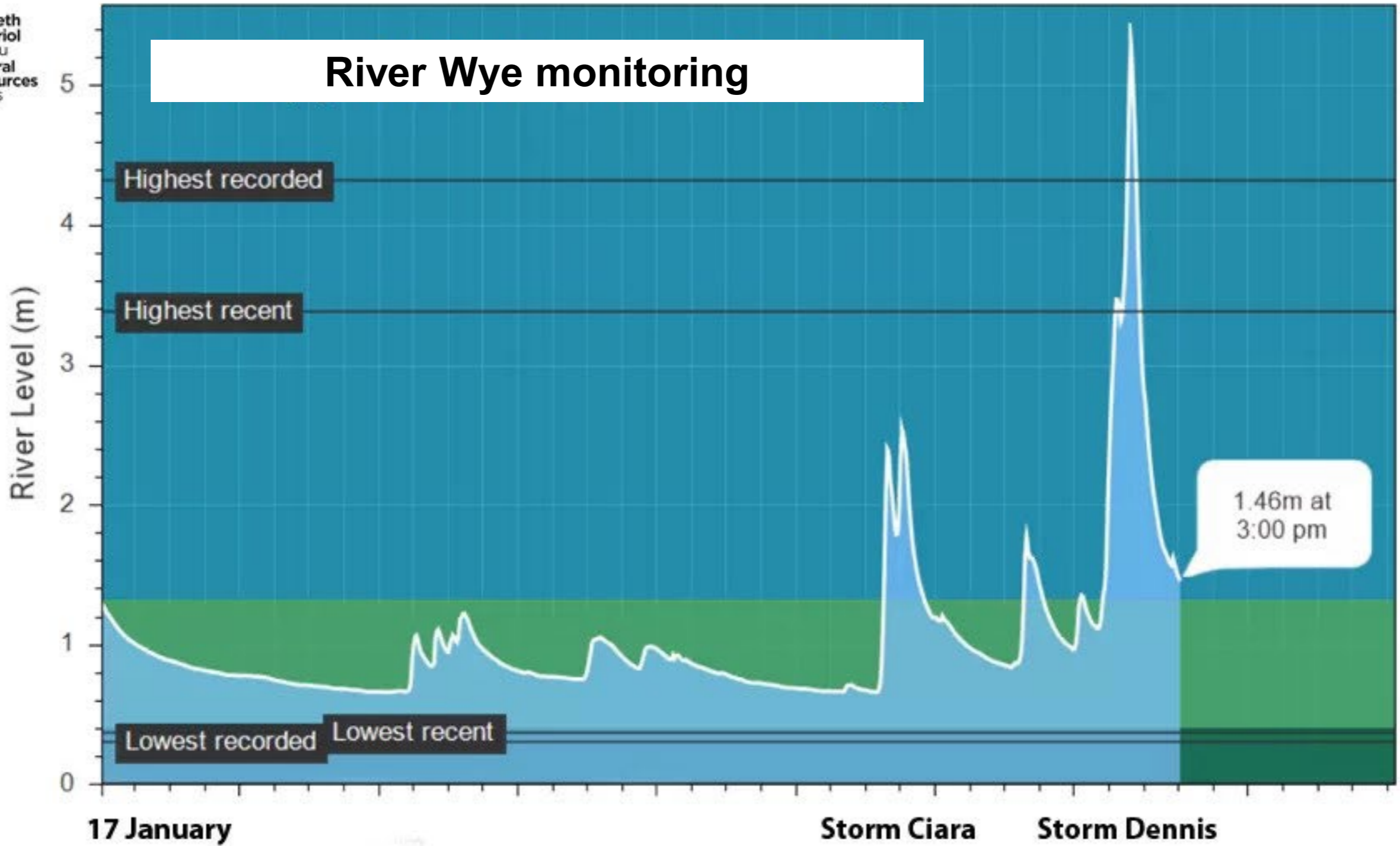
Overgrazing and deforestation preventing soil from storing water  
(much less interception)  
and much lower organic matter levels



Nothing in the catchment to 'slow the flow' cause extreme flooding events

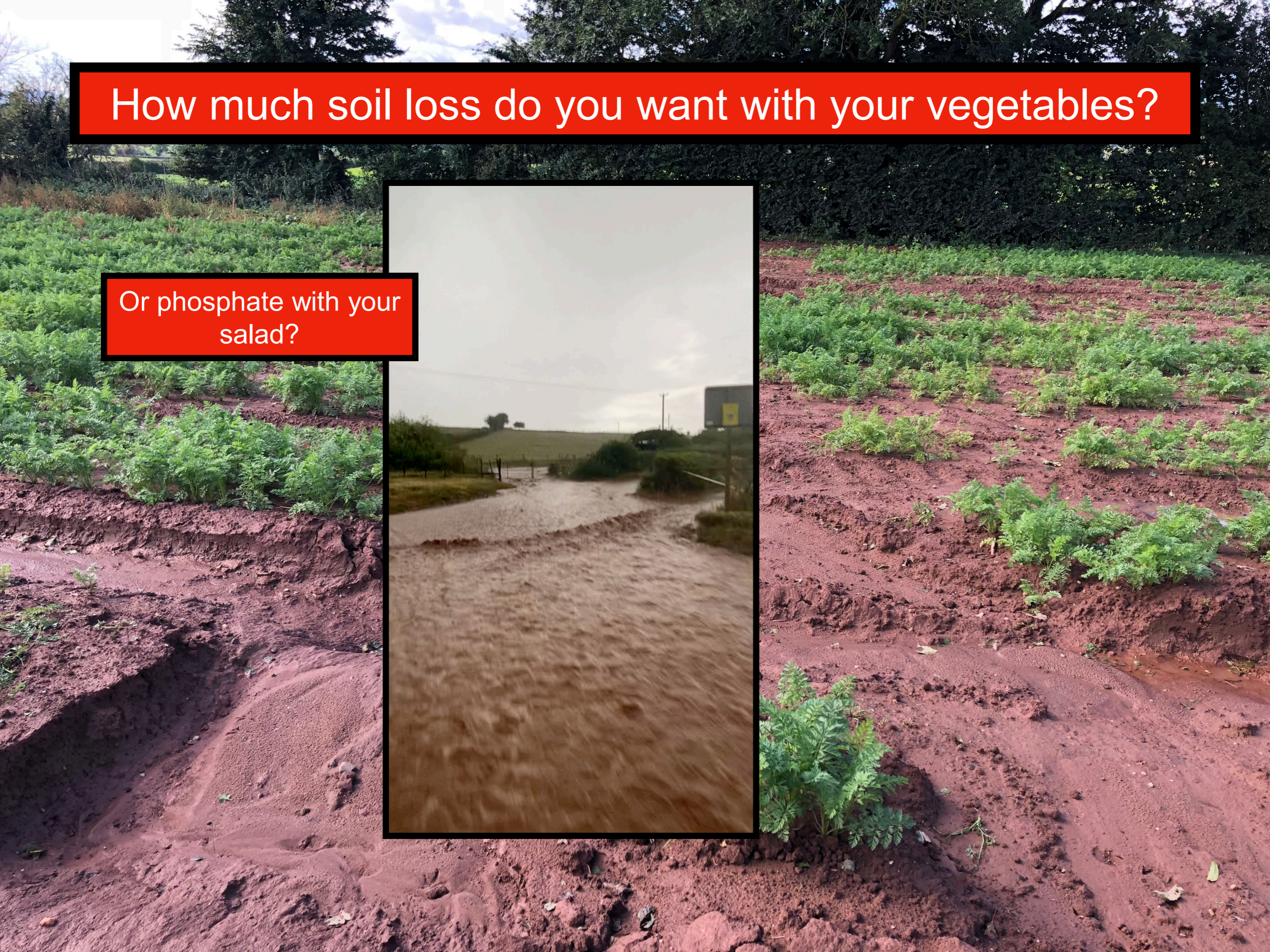


# River Wye monitoring



How much soil loss do you want with your vegetables?

Or phosphate with your salad?



# Taking ownership

## The reality of Townsend Farm

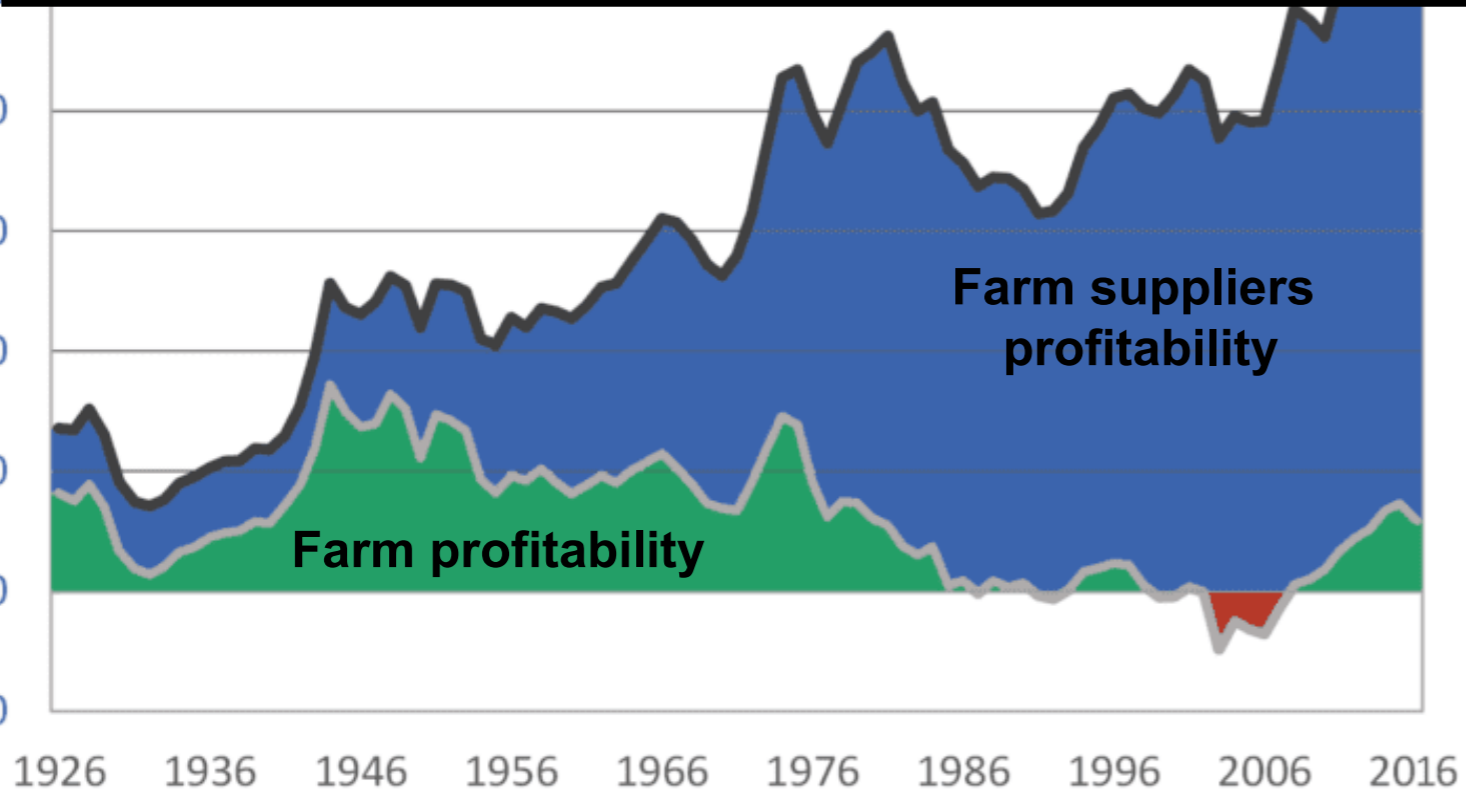
1974 - 1997

1997 - 2012

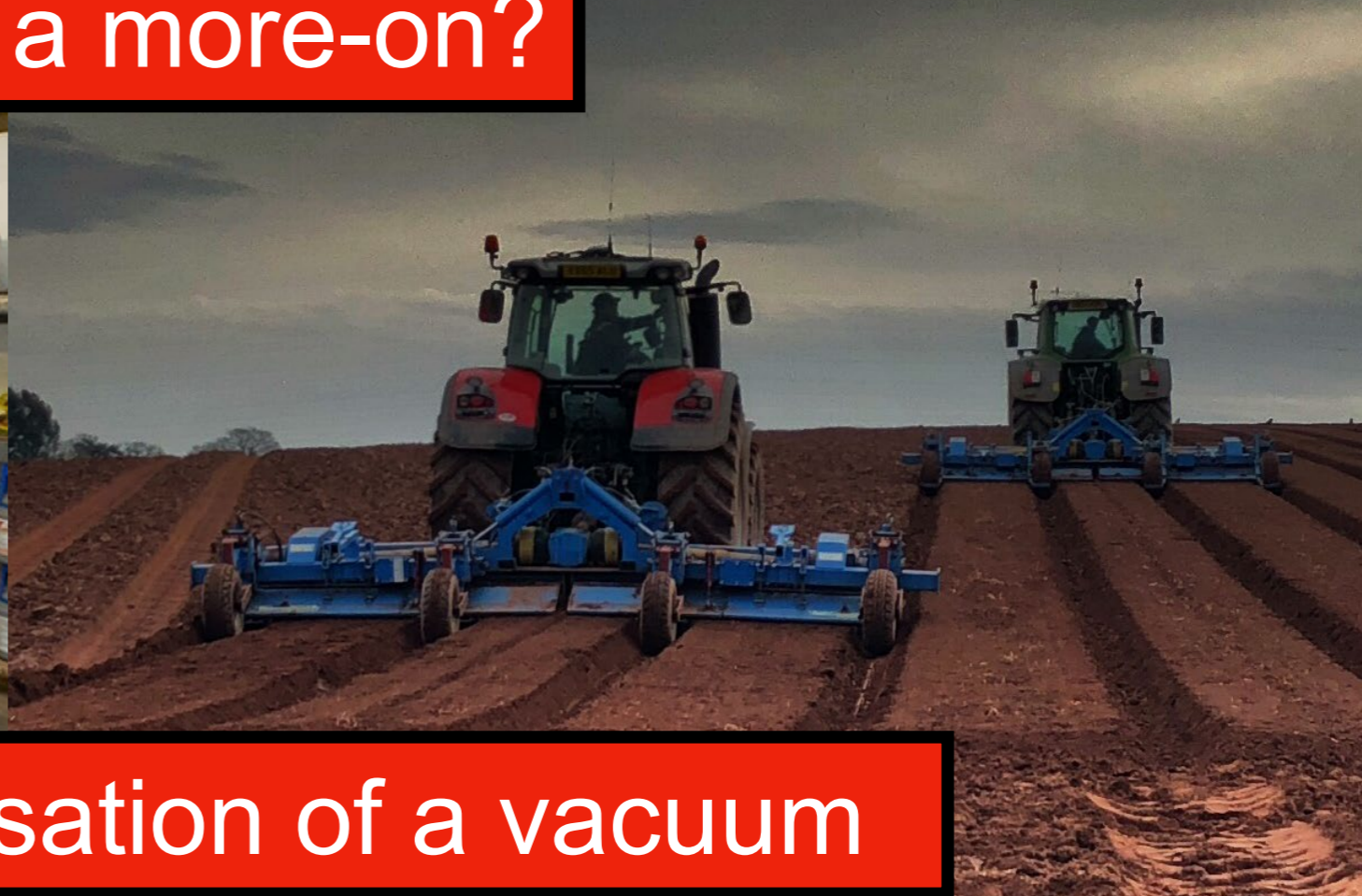
2012 - 2016



# Historical 'mastering' of soil as a medium to grow crops



Are you a more-on?

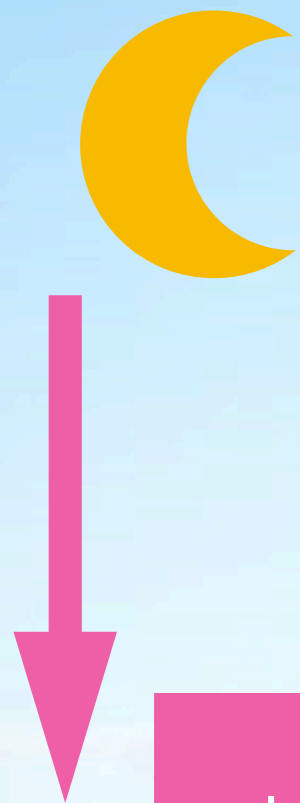
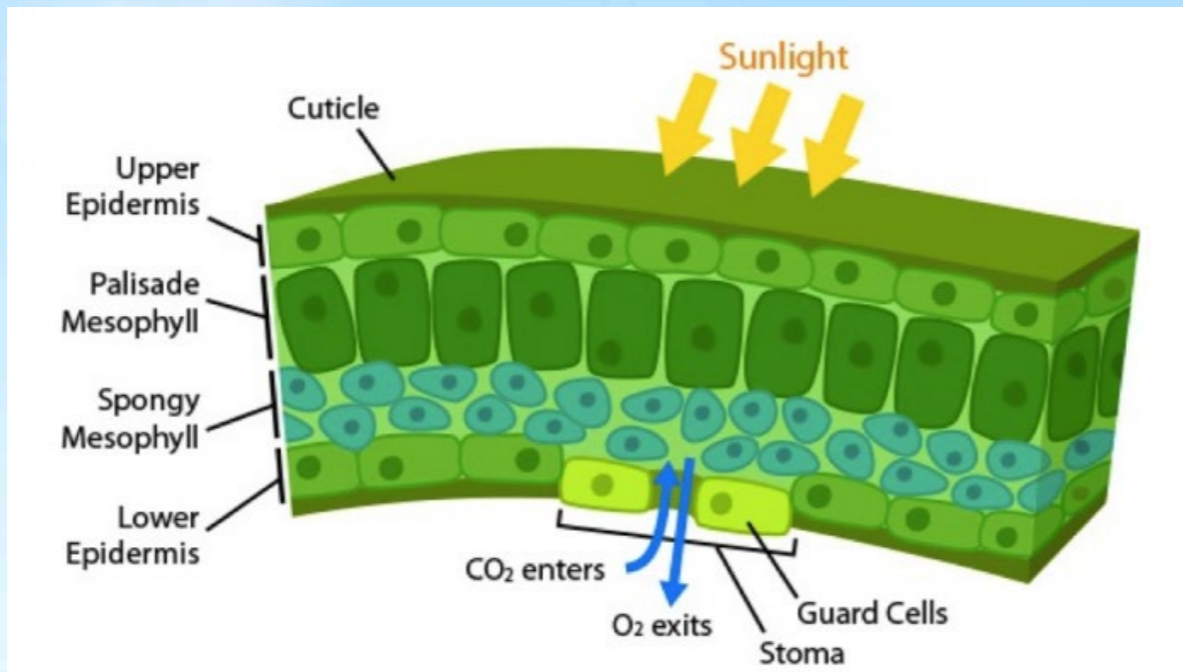


The pest colonisation of a vacuum

# Healthy soils - Why?







O<sub>2</sub> and N<sub>2</sub> replenish into the soil

Stomata (underside of leaf)

Microbial activity respiring CO<sub>2</sub>

Mixing with H<sub>2</sub>O to form carbonic acid



Moon pulls water



Soil moisture

# Replacing death with life!

Regenerative fruit, salad and vegetable production  
For a more sustainable future  
For increasing profits  
For improving produce quality and storability

Keep harvesting the sun's energy to feed the soil life

**Farming with your eyes....**





## 5 principles of soil health

**Living roots.** Maintain a living root in soil as long as possible throughout the year. Living roots are feeding soil biology by providing its basic food source: carbon. This biology, in turn, fuels the nutrient cycle that feeds plants.

**Limited disturbance.** Limit mechanical, chemical, and physical disturbance of soil. Tillage destroys soil structure. It is constantly tearing apart the “house” that nature builds to protect the living organisms in the soil that create natural soil fertility. The result of tillage is soil erosion.

**Armour.** Keep soil covered at all times. Bare soil is an anomaly—nature always works to cover soil. Providing a natural “coat of armour” protects soil from wind and water erosion while providing food and habitat for macro- and microorganisms. It will also prevent moisture evaporation and germination of weed seeds.

**Diversity.** Strive for diversity of both plant and animal species. Where in nature does one find monocultures? Only where humans have put them! Grasses, forbs, legumes, and shrubs all live and thrive in harmony with each other. Diversity enhances ecosystem function

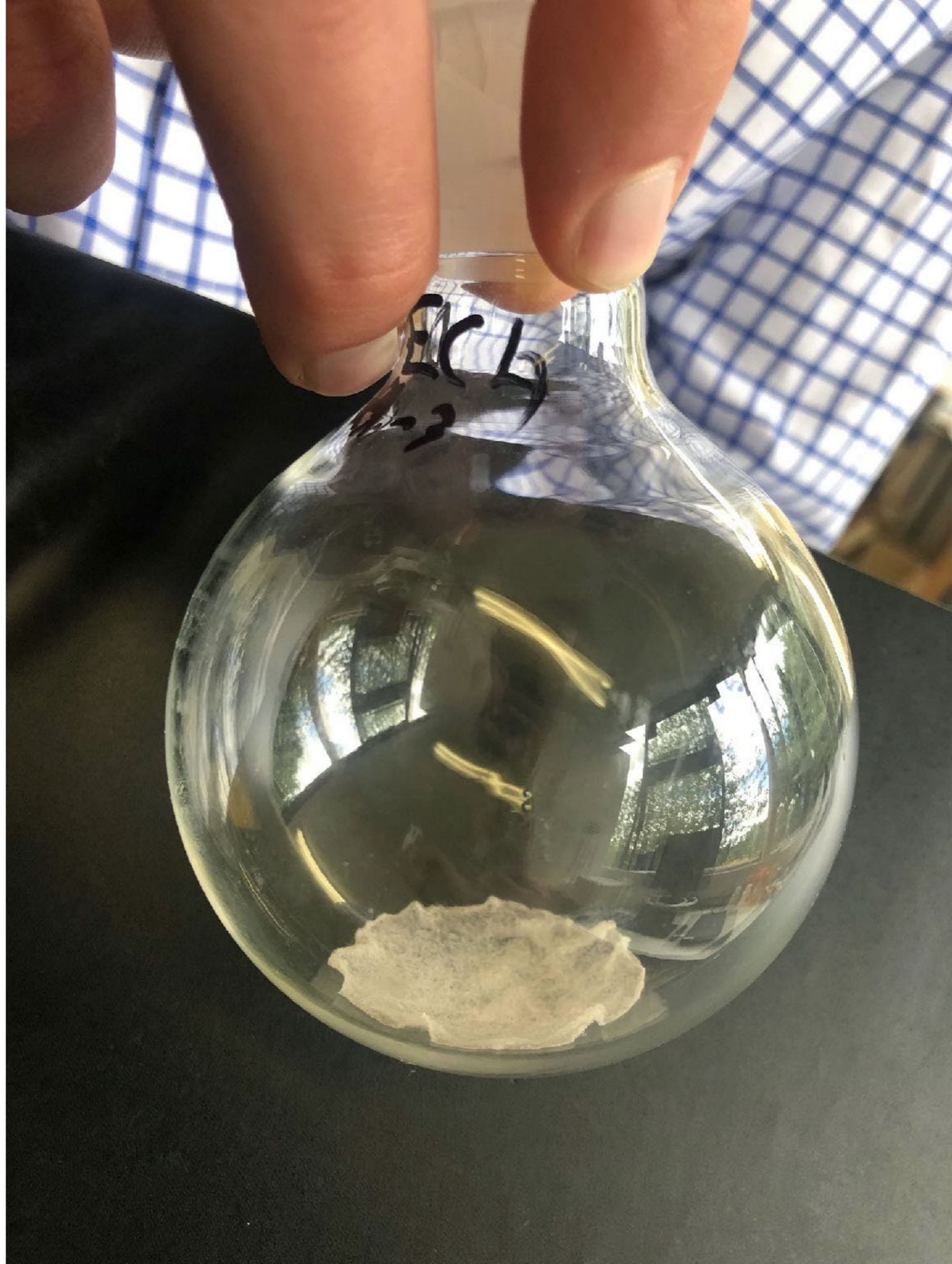
**Integrated animals.** Nature does not function without animals. It is that simple. The major benefit is that the grazing of plants stimulates the plants to pump more carbon into the soil. This drives nutrient cycling by feeding biology. If you want a healthy, functioning ecosystem on your farm, you must provide a home and habitat for not only farm animals but also pollinators, predator insects, earthworms, and all of the microbiology that drive ecosystem function.

## Living roots

**The exudates of 12 wheat plants in the first 14 days of growth (produced in pure water) and then freeze dried.**

**Carbon rich (52%) Amino acids produced to feed the below ground biology.**

**In turn, the below ground biology scavenges nutrients to give back to the plant - Plant/soil symbiosis at its finest**



Everyone is a livestock farmer!



It's just most livestock is invisible!



Feeding livestock above and below the ground - no days off!

Soil microbes in healthy soils weight of 5 cows per hectare!

In order of preference for food

1.Amino acid root exudates

2.Dead plant roots

3.Crop residues.

4.If none of this is available they will feed on OM, reducing the quantity and quality.



Beginning to run out of 'root' in October

Cover crops more roots, bigger solar panel, more feed.



Asparagus for our shop  
Asparagus for the environment



# Regenerative asparagus in the Wye Valley

## Row-Mow - understory of clover



4th September lambing



Limited disturbance





N 14:38 

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Speed warning

--- mph

37.0 °C

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0 km/h

Bare soil



Armour

Standing crop



Mulch



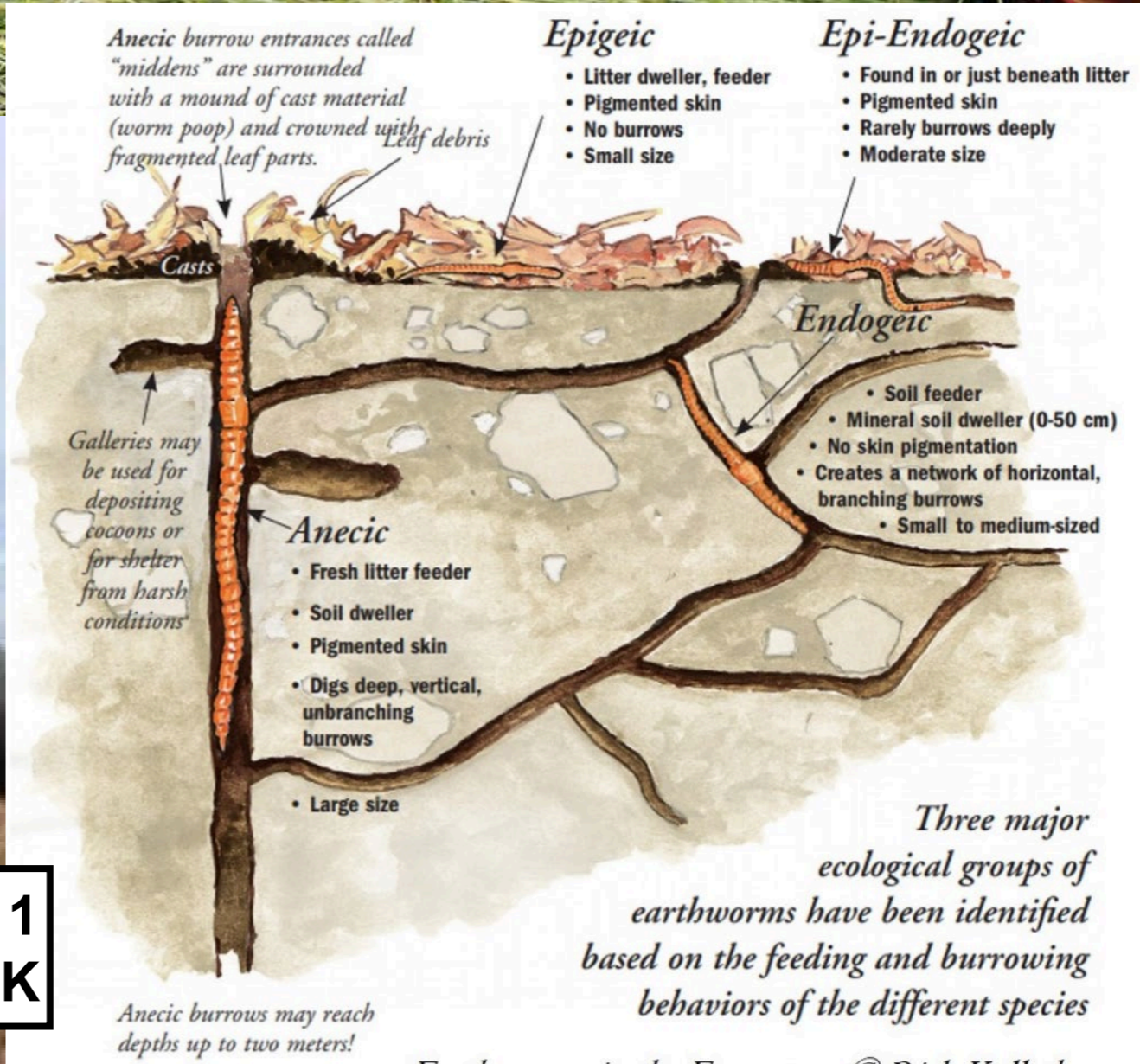
12th August



- Anecic: from Greek “out of the earth”
- Endogeic: from Greek “within the earth”
- Epigeic: from Greek “upon the earth”



**2:5:7:11**  
**H:N:P:K**



# A simple example of diversity in wheat

Mixture of 144 varieties

Single variety









Diversity allowing the removal of “cides”



Competitive exclusion



# Integration of Livestock



# Mob graze cover crops For soil health and capturing nutrients



# Diversity in the flerd



Removal of insecticides



Provide habitats for beneficials

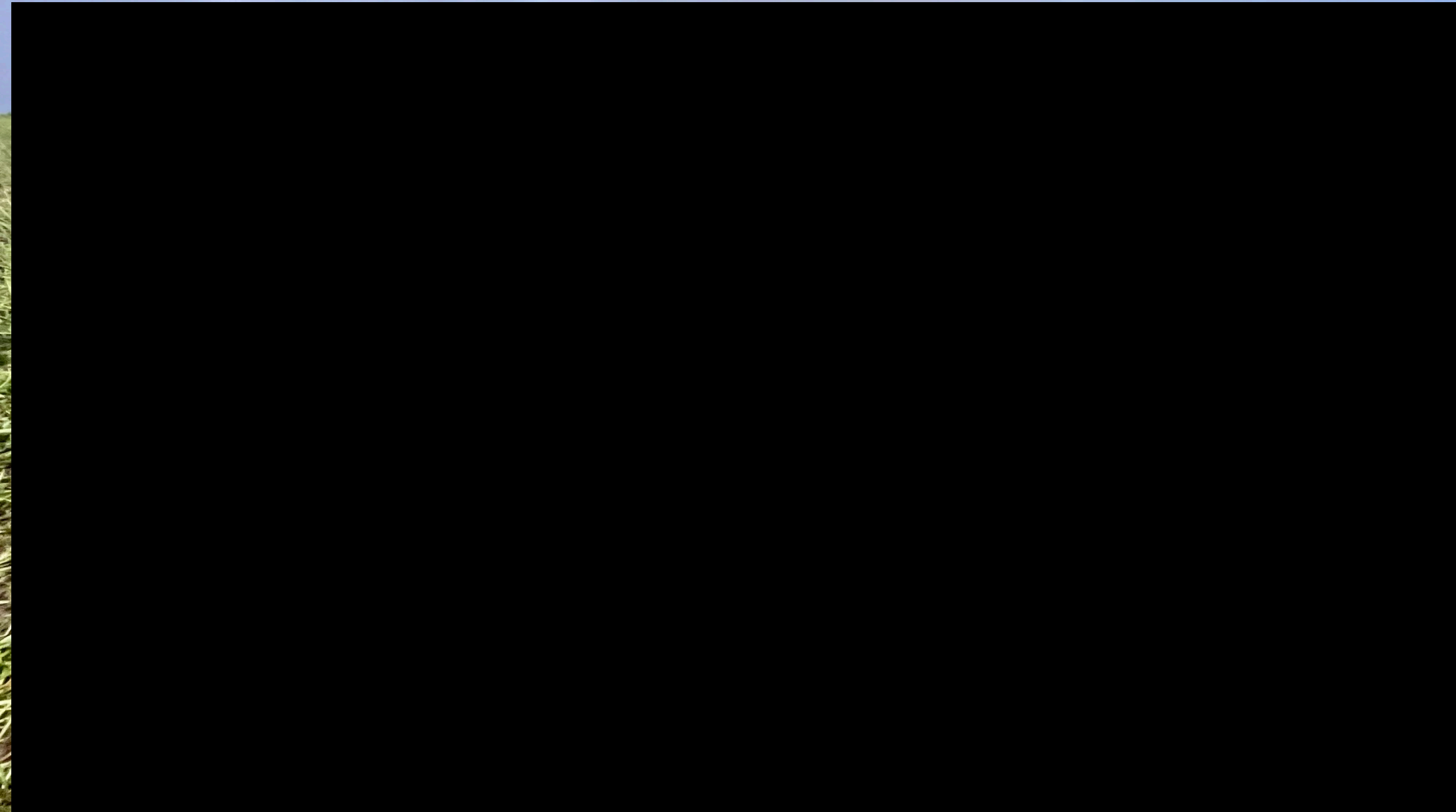


# Regenerative Maize!



Proof ?

Soil building and resilience in a vegetable rotation





Who's growing veg?



# Human integration!



Thank you

COME AND VISIT!



Reg  
ben

Farming that won't cost the earth