



25-26 June 2019 in Lisieux,
Normandy - France

Thematic Session 2: What kind of production systems are needed for the sustainable management of natural resources?

Workshop 2.1: Soil: fertility, biological life and fighting against erosion

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<https://www.reseaurural.fr/Sommet-agri-innovation-2019>

<https://ec.europa.eu/eip/agriculture/en/event/agri-innovation-summit-2019>

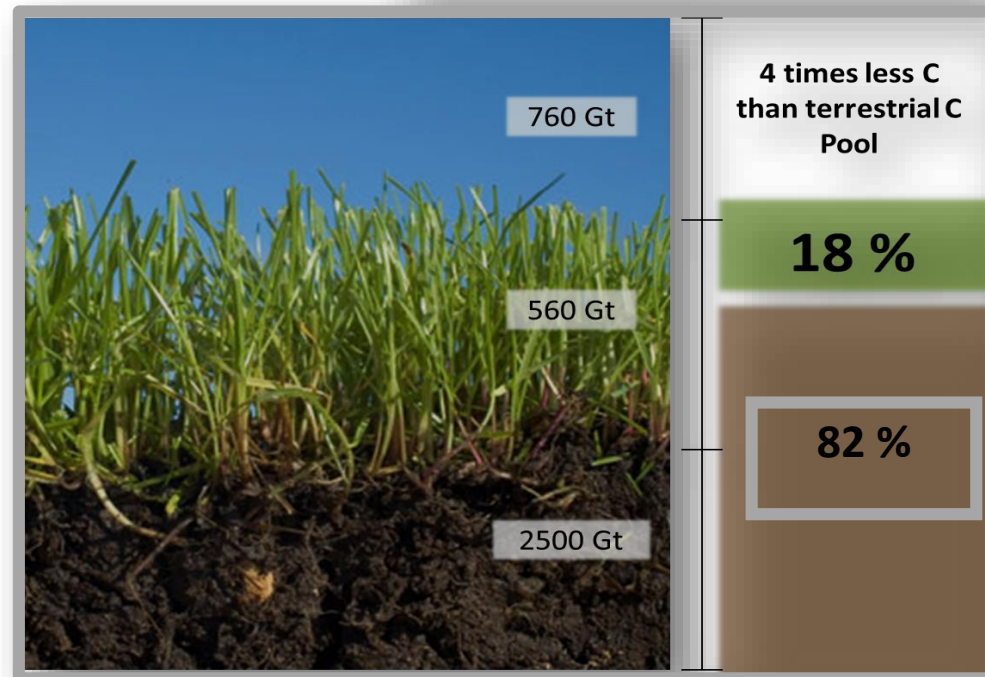


Cette action est cofinancée par le Fonds européen agricole pour le développement rural : l'Europe investit dans les zones rurales.



SOIL IS FERTILE

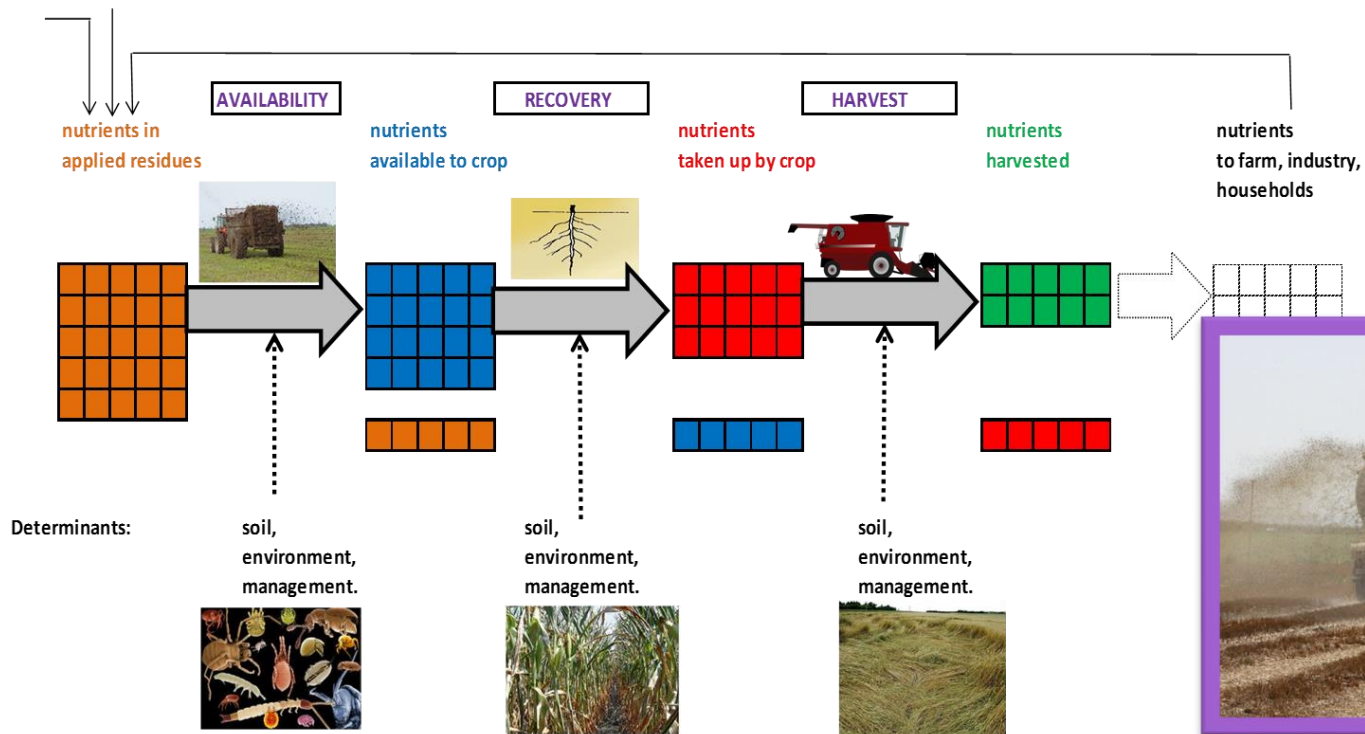
- Produces plant biomass for human use, providing 4F **food, feed, fiber, fuel.**
- Stores **carbon.**



SOIL IS FERTILE

- Receives, provides and carries over nutrients into harvested crops

NUTRIENT CYCLING



Plant Nutrient Functions:

- Leaves:**
 - Promote plant growth:** N, P, K, Ca, Mg, S
 - Improves winter hardiness:** P
 - Involved in photosynthesis:** N, P, K, Mg, S, Fe, Zn
 - Increases disease resistance:** K
 - Reduces plant respiration:** Ca
 - Promotes root formation and growth:** P
 - Increases water-use efficiency:** K
 - Stimulates microbial activity:** Ca
 - Promote nodule formation on legumes:** Mo, S
- Stem:**
 - Involved in carbohydrate metabolism and translocation of starches:** K
 - Promote reproduction:** S, Cu
 - Aid translocation of photosynthesis from leaves to fruiting organs:** S, Ca
 - Acts as an O₂ carrier:** Fe
- Fruit/Seed:**
 - Fruit formation:** K, Ca
 - Quickens maturity:** S
 - Fruit quality:** P
 - Fruit flavour:** Cu
 - Seed formation:** Zn, P, S
 - Seed quality:** K
 - Enhances maturity of small grains:** B
 - Aids in enzyme functionality and plant use of Fe and P:** Mo
 - Responsible for enzyme activity:** S, Mn
 - Helps enzyme activity and increases the availability of P and Ca:** Mn

Soil Nutrients:

- Soil macronutrients:** P (Phosphorus), K (Potassium), N (Nitrogen)
- Soil micronutrients:** Ca (Calcium), B (Boron), Cu (Copper), Fe (Iron), Mo (Molybdenum), Si (Silicon), S (Sulfur), Zn (Zinc), Mg (Magnesium), Na (Sodium), Cl (Chlorine)

The infographic features a stylized white silhouette of a person against a light blue background. Red arrows point from descriptive text boxes to colored circles representing different minerals on the silhouette. The minerals are labeled with their chemical symbols: Fe (Iron), Zn (Zinc), Mg (Magnesium), S (Sulfur), K (Potassium), Ca (Calcium), N (Nitrogen), Cl (Chlorine), P (Phosphorus), Mo (Molybdenum), Mn (Manganese), B (Boron), Cu (Copper), and Se (Selenium). A teal circle in the top left corner contains the text 'A diet rich in 18 essential nutrients is necessary for optimal growth and human health'. At the bottom left, there is a small circular logo with the letter 'H' and the word 'PROGEN' below it.

- Plays a key role in brain and muscle function** → Fe
- Contributes to perception of taste** → Zn
- Needed for immune system health** → Zn
- Key component of protein** → S
- Essential for muscle and nerve activity** → Mg
- Important in immune system health, blood clotting and pressure regulation** → K
- A component of proteins, DNA, RNA and blood** → Ca
- Promotes digestive process** → N
- Maintains acid-base balance** → Cl
- Needed for proper fluid balance** → P
- Essential to fetal development and functioning of reproductive system** → K
- Key component of enzymes** → Zn
- Helps deliver oxygen to the tissues** → Fe
- Important for healthy bones** → B
- A component of enzymes, DNA, RNA, proteins and promotes immune system health** → Cu
- A component of enzymes and involved in Fe metabolism** → Cu

Over **2 billion** people suffer from micronutrient deficiencies

**Sustainable
soil management
for healthy soils,
healthy food
and healthy people**

Ensure crop rotation

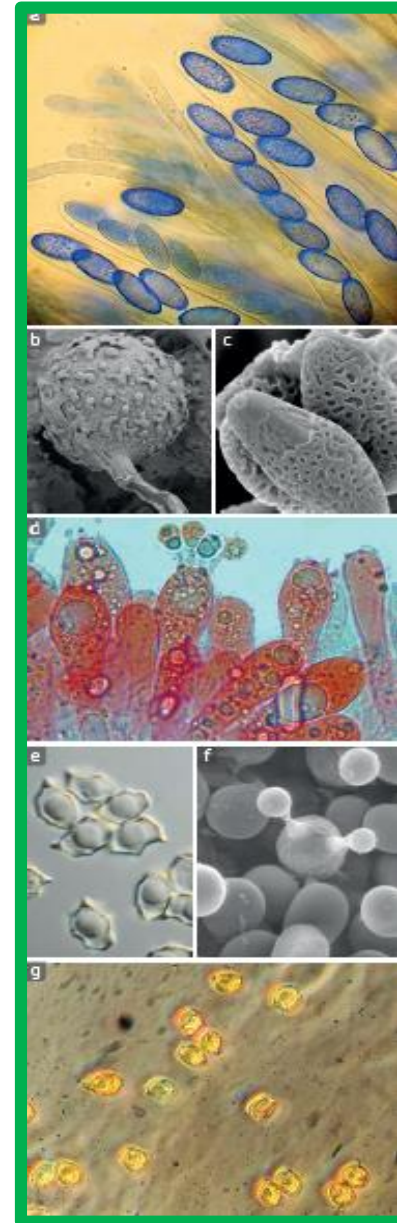
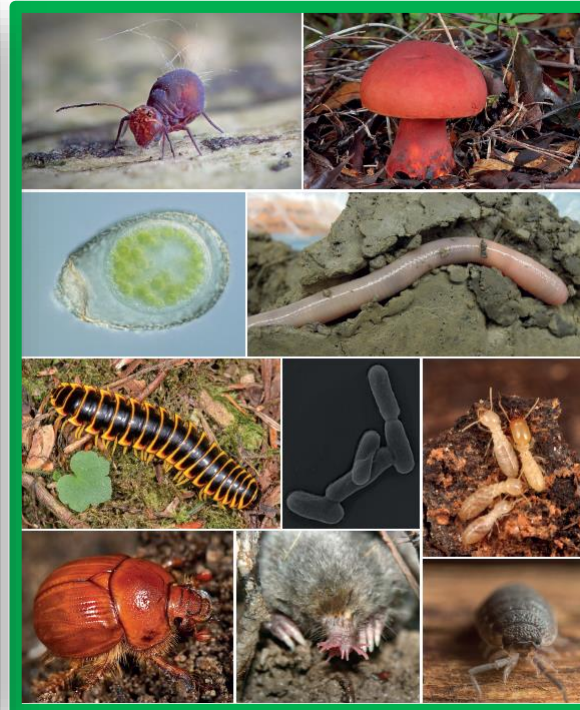
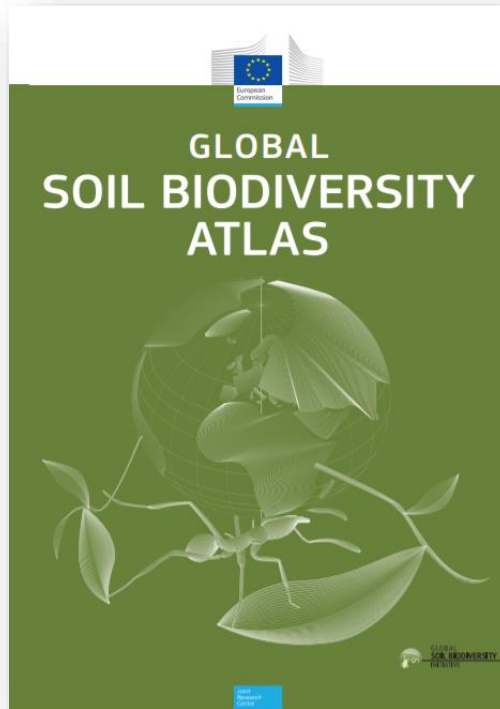
Keep soil surface covered

Minimize tillage

Increase soil organic matter content

SOIL IS ALIVE

- Billions of soil organisms and biological processes, interacting in an ecosystem.
- Soil biodiversity is extremely diverse in shapes, colours, sizes and functions.

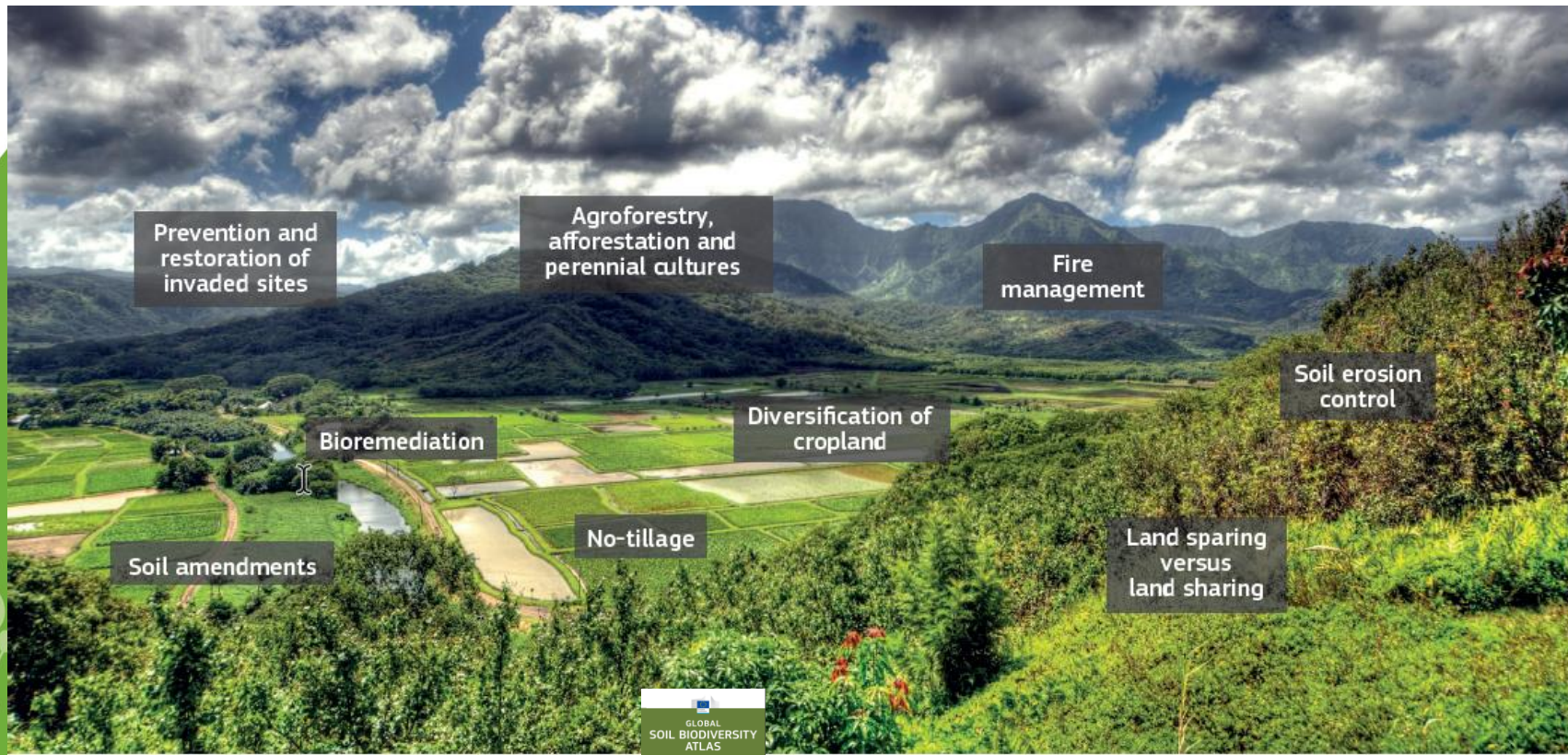


SOIL..

- Receives, stores and conduct water for subsequent use
- Preventing droughts, flooding, **erosion** and removing harmful compounds



AGROECOLOGY & BIODIVERSITY



There are several actions that can facilitate conservation of soil-living communities, which can be identified when looking at the environment around us. Most of the measures would be possible through a better management of human activities: from diversification of cropland to no-tillage and soil erosion control. (ARO, JRC)

CHAPTER VI – INTERVENTIONS



GLOBAL
SOIL BIODIVERSITY
ATLAS

CHAPTER VI – INTERVENTIONS

<https://esdac.jrc.ec.europa.eu/content/global-soil-biodiversity-atlas>

What is your agroecological solution?

- Maintain soil health?
- Maintain soil structure?
- Restore ecosystem functioning?
- Increase and monitor soil organic matter?
- Monitor soil biodiversity?
- Build on farmer's knowledge?
- Choose your crop rotation/mixture?
- Integrate crop production with livestock?
- Regulate the use of water in your farm?