Cover Crops, Interseeding, and No-Till Planting: A cropping strategy for soil health

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TERRALIS
SOLUTIONS ÉCOLOGIQUEMENT INTENSIVES

Triolact
Solution fourrages • Forage Solutions

Where is the edge of my cropping system?


1


2


3
Turbo
INTERNATIONAL


4
posted to FarmPhoto.com

Always due yesterday

Mechanization?

Always the same story….

Using excessive force might reflect a lack of judgment or knowledge

We are REACTING to our cropping systems…. IN EVERY RESPECT

In an era of easy and outrageous solutions

INTENSIVE AGRICULTURE……

The only '*domination*' is the lack of understanding and ignorance of the soil system

WORK AND SHORT ROTATION

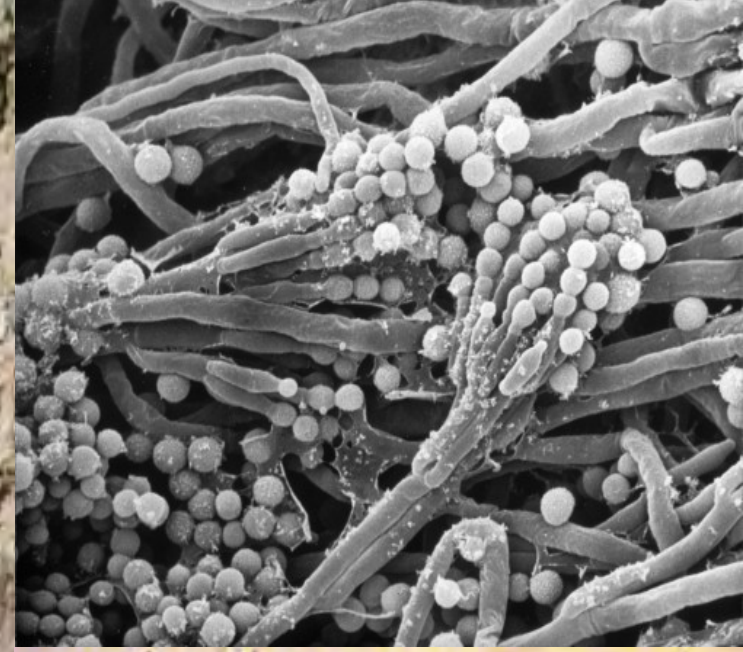
The "Prescription" era….

Where our **imagination** is put aside by shoving down our throat a standardized model

We HAVE to think to other methods less energy-consumning to be more respectful of the physical and biological properties of soil.

And it HAS to make sense

EIA (Ecologically Intensive Agriculture)



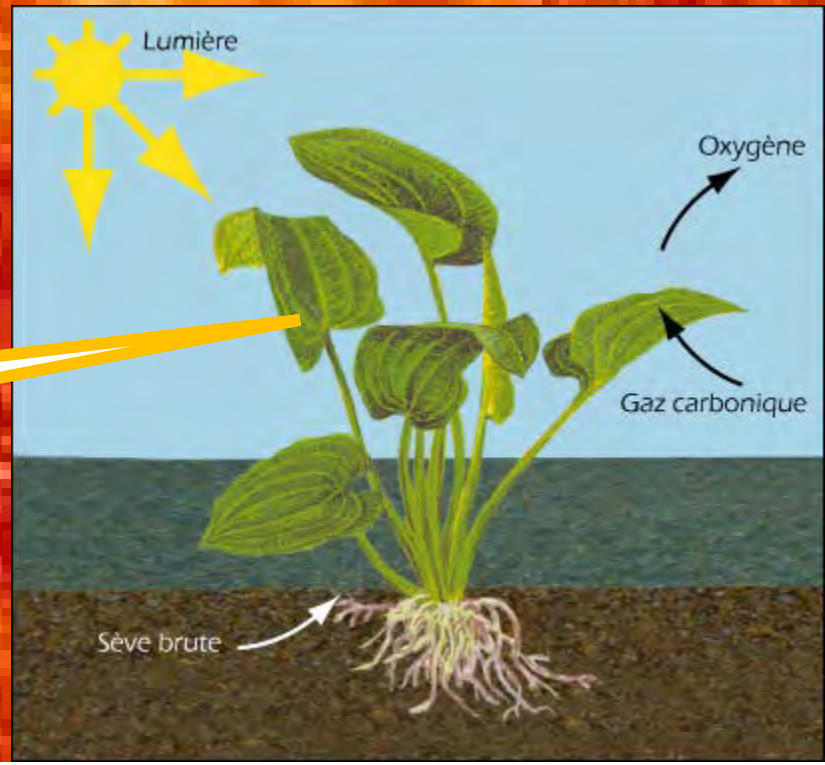
For once, you can

combine economy and ecology

Why not take advantage of it!

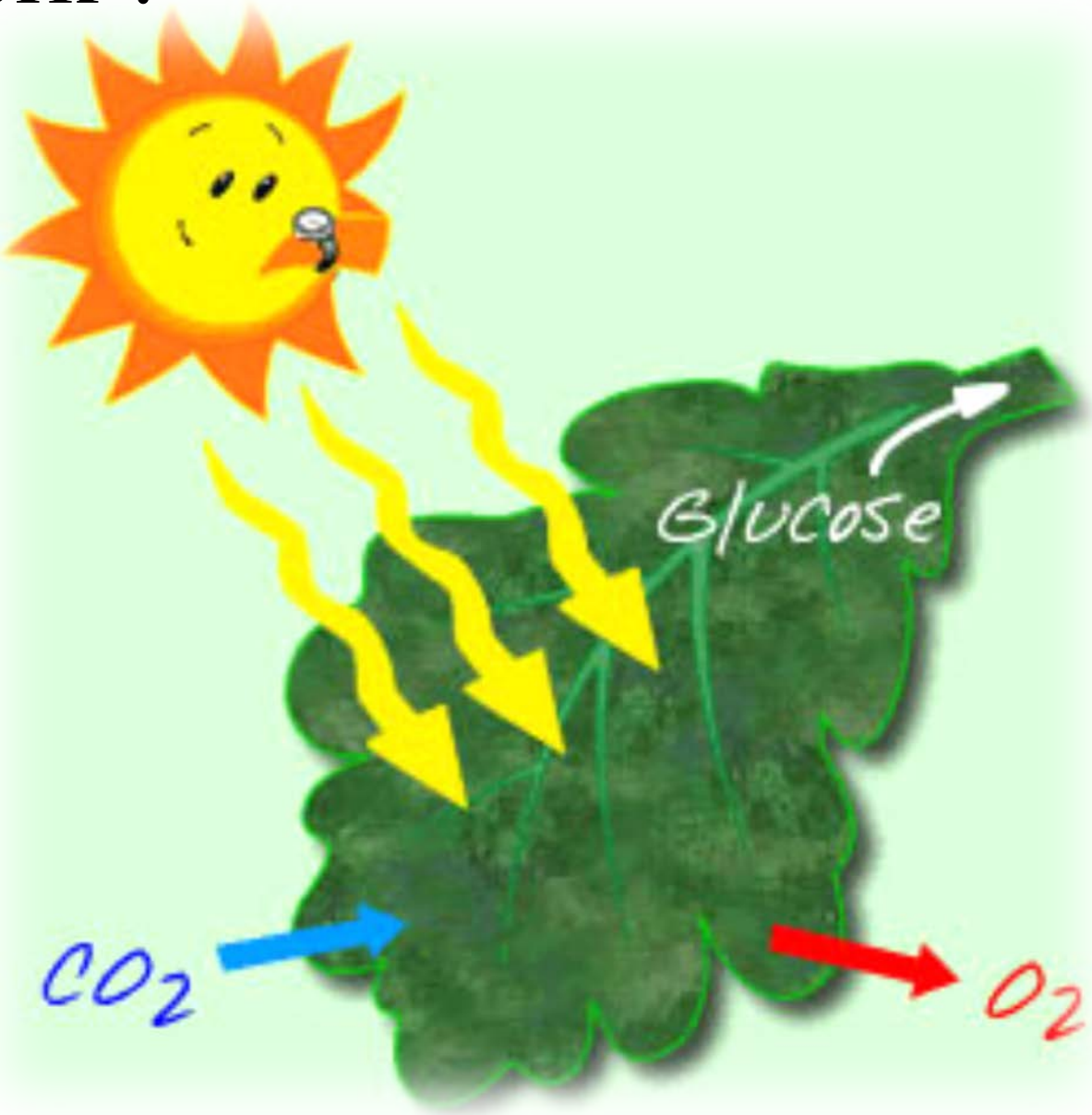

Forest ECOSYSTEM


CROPPING… ECOSYSTEM!
COVER CROPS SYSTEM (CCS)

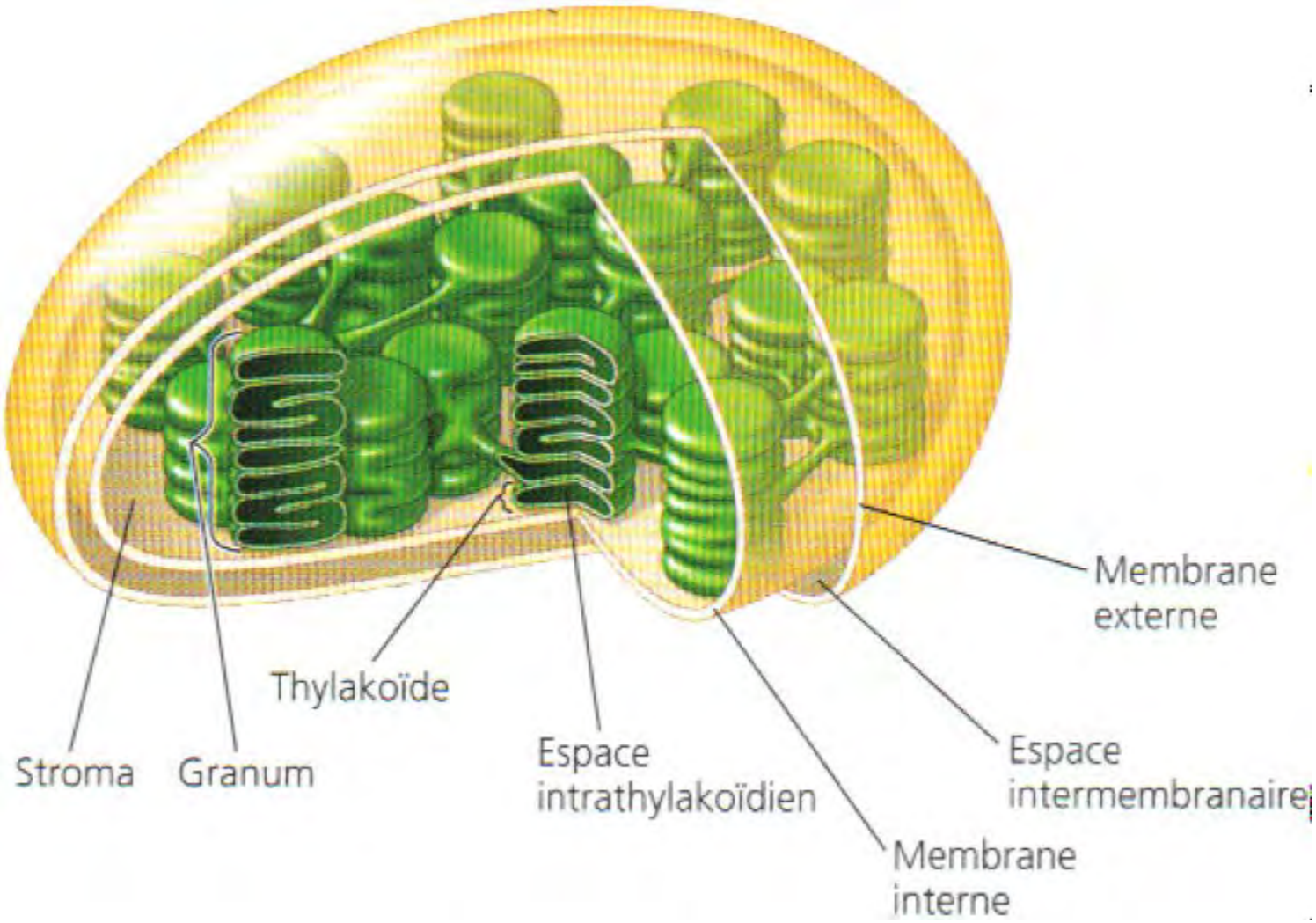


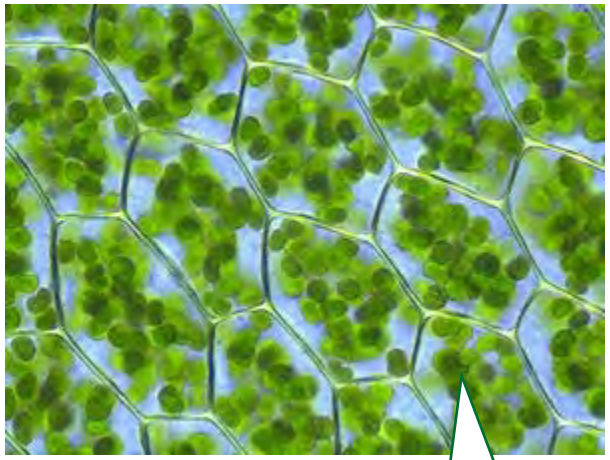
WE SHOULD ESTABLISH PERMANENT ENERGY PUMPS: PLANTS

How does it work ?

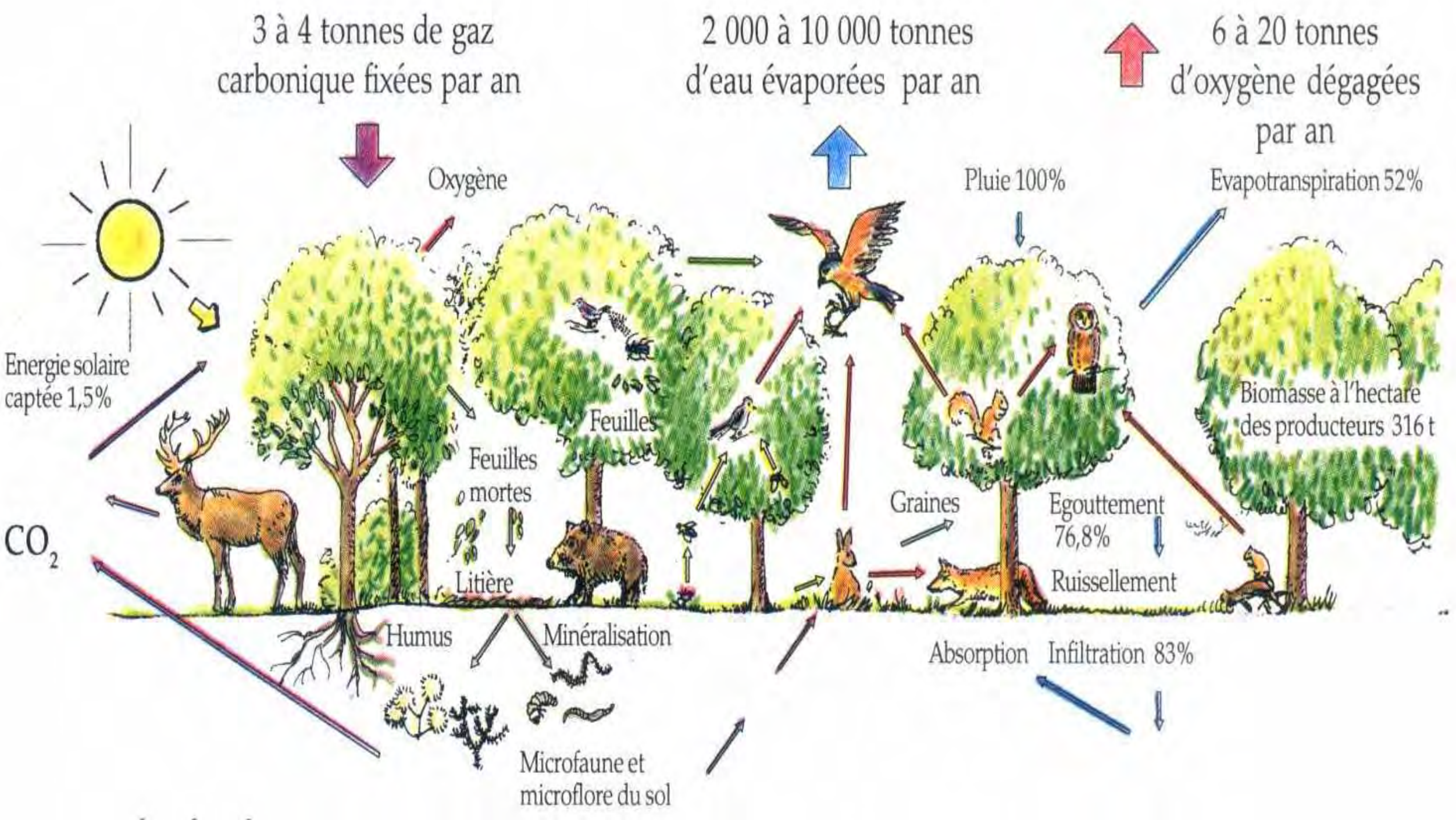


Chloroplasts have an important role in the carbon cycle by transforming inorganic carbon (atmosphere) into organic carbon (sugars)





Chloroplasts carry out photosynthesis. They produce organic materials from carbon dioxide and water, using sunlight as energy.


3 à 4 tonnes de gaz carbonique fixées par an
2 000 à 10 000 tonnes d'eau évaporées par an
6 à 20 tonnes d'oxygène dégagées par an
Oxygène
Pluie 100%
Evapotranspiration 52%
Energie solaire captée 1,5%
Feuilles
Feuilles mortes
Biomasse à l'hectare des producteurs 316 t
CO_2
Graines
Egouttement 76,8%
Litière
Ruissellement
Humus
Minéralisation
Absorption
Infiltration 83%
Microfaune et microflore du sol

Carbon production, it is all about photosynthesis

Total photosynthesis period (240 jrs.)

Growing photosynthesis period (150 jrs)

They call themselves producers!!

They loose 40% of their free energy

I hate light, but I love the carbon provided from it through photosynthesis!

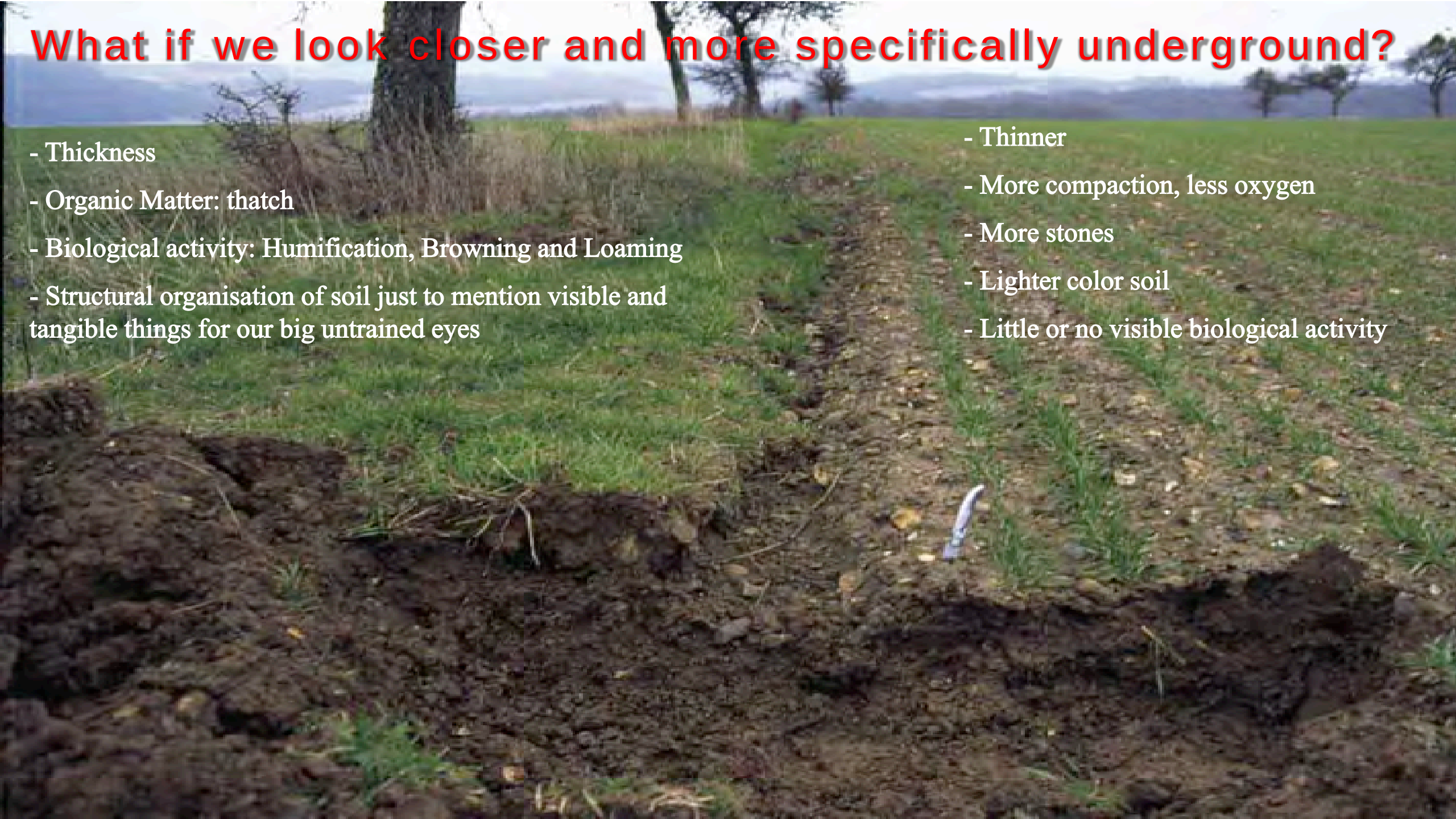
90 days lost yearly

J F M A M J J A S O N D

What if we look closer and more specifically underground?

- Thickness
- Organic Matter: thatch
- Biological activity: Humification, Browning and Loaming
- Structural organisation of soil just to mention visible and tangible things for our big untrained eyes

- Thinner
- More compaction, less oxygen
- More stones
- Lighter color soil
- Little or no visible biological activity



The dynamic of the different soil mineral elements is influenced by the microbial activity, which itself is influenced by the soil carbon dynamics

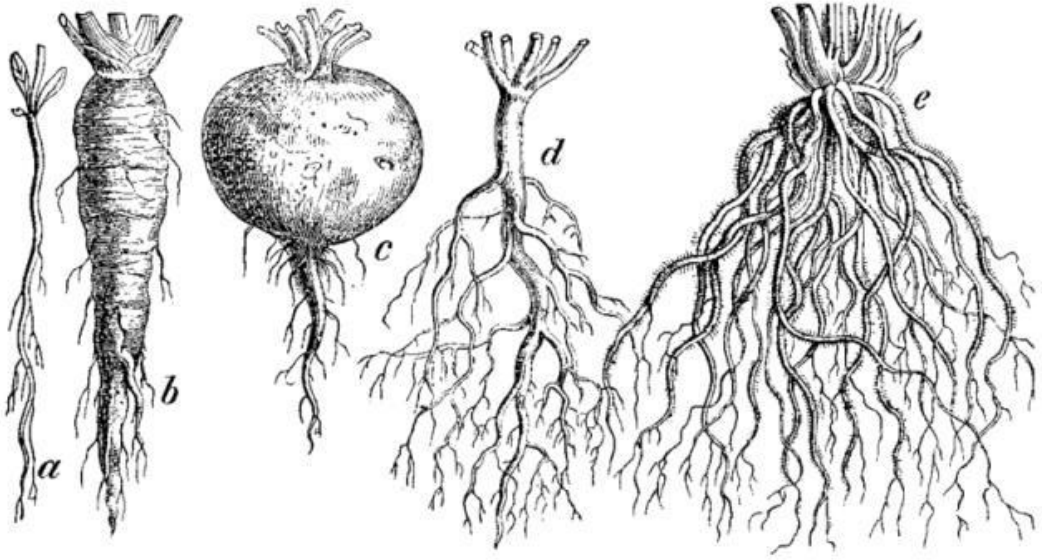
Prior to establish our cover crops:

- **Soil physico-chimical properties**
  - Surface drainage
  - Underground drainage
  - Levelling
  - Deep zone tilling
  - Liming and fertilization (manure, composts, fertilizer)

- **The organic part of soil**
  - Fill soil cracks with roots and other organic materials
  - *BIODIVERSITY-BIODIVERSITY-BIODIVERSITY*
    - **Roots**
    - **Air**
    - **Species family**
  - C/N
  - High DM tonage/ ha

System survivability:

Diversity in cover crop species




WE GET 86% OF A 3 YEAR-
OLD HAY FIELD ROOT MASS
IN ONLY 3 MONTHS!

Outstanding results!


7 SPECIES SEED MIX

MANURE MANAGEMENT: RECYCLING NUTRIENTS WITH CROPS


Protective cover and pantry year-round

SAME SOIL MOISTURE

SOIL TEMPERATURE 0,5°C HIGHER IN COVER CROP FIELDS

Planted at the same time as neighboring bare fields, but in better soil conditions

Coming out of winter


CX80
CASE

NO-TILL SEED CORN ON COVER CROPS 10 SPECIES


CANARY GRASS THAT SURVIVED WINTER
CORN !


CANARY GRASS AND CC RESIDUES FOLLOWING GLYPHO.

OBSERVATIONS and the UNDERSTANDING of EIA

2013 COVER CROP MIX 7 SPECIES


STARVING root hair!

O-TILL SEEDING FABA BEANS IN COVER CROPS

YE

LOVER

NO NPK---- » Can’t find the dog!


Please leave us something!!
Sunday Sept 1st

winter rye and red clover seeded behind the combine

19867 kg / 8,1 ha
= 2452,71kg

Hurry up before it is raining

-Sept 2 : 2 inches rainfall
-Sept 5 : 1 inch rainfall

The ones who waited, didn't go back in the field until Sept 13th.


26 HOURS AFTER PLANTING


Where there is life, there is hope!!

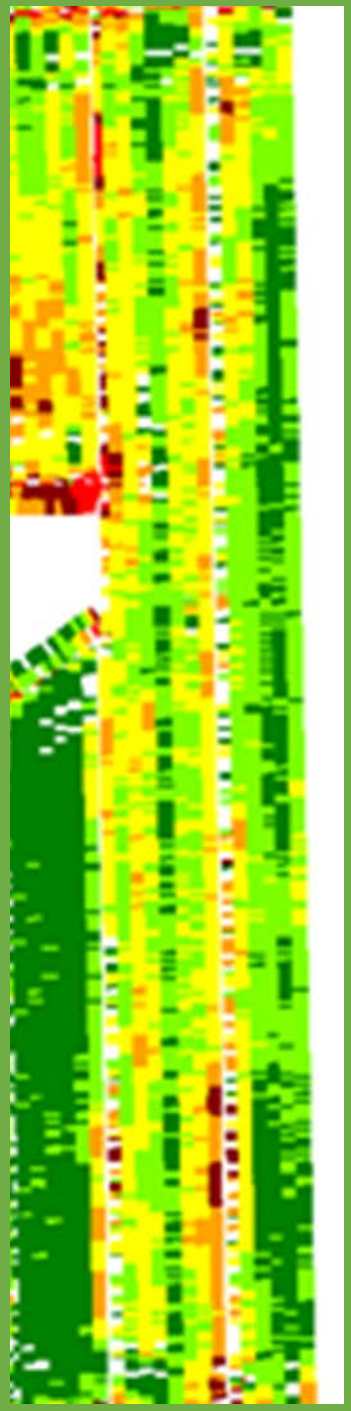
WINTER CEREALS


90 DAYS OF PHOTOSYNTHESIS IN THE FALL
30 DAYS EXTRA IN THE SPRING
120 DAYS TOTAL!!!


JOHN DEERE

Dark green band: No-till seeding in winter rye

Rest was no-till seeding in faba beans

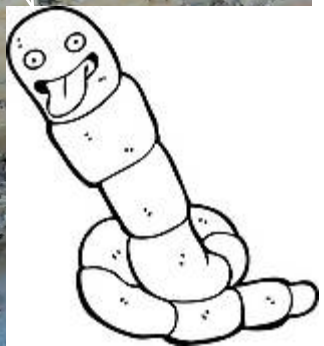


Case Study in Montérégie

Profile showing caking and perched water table

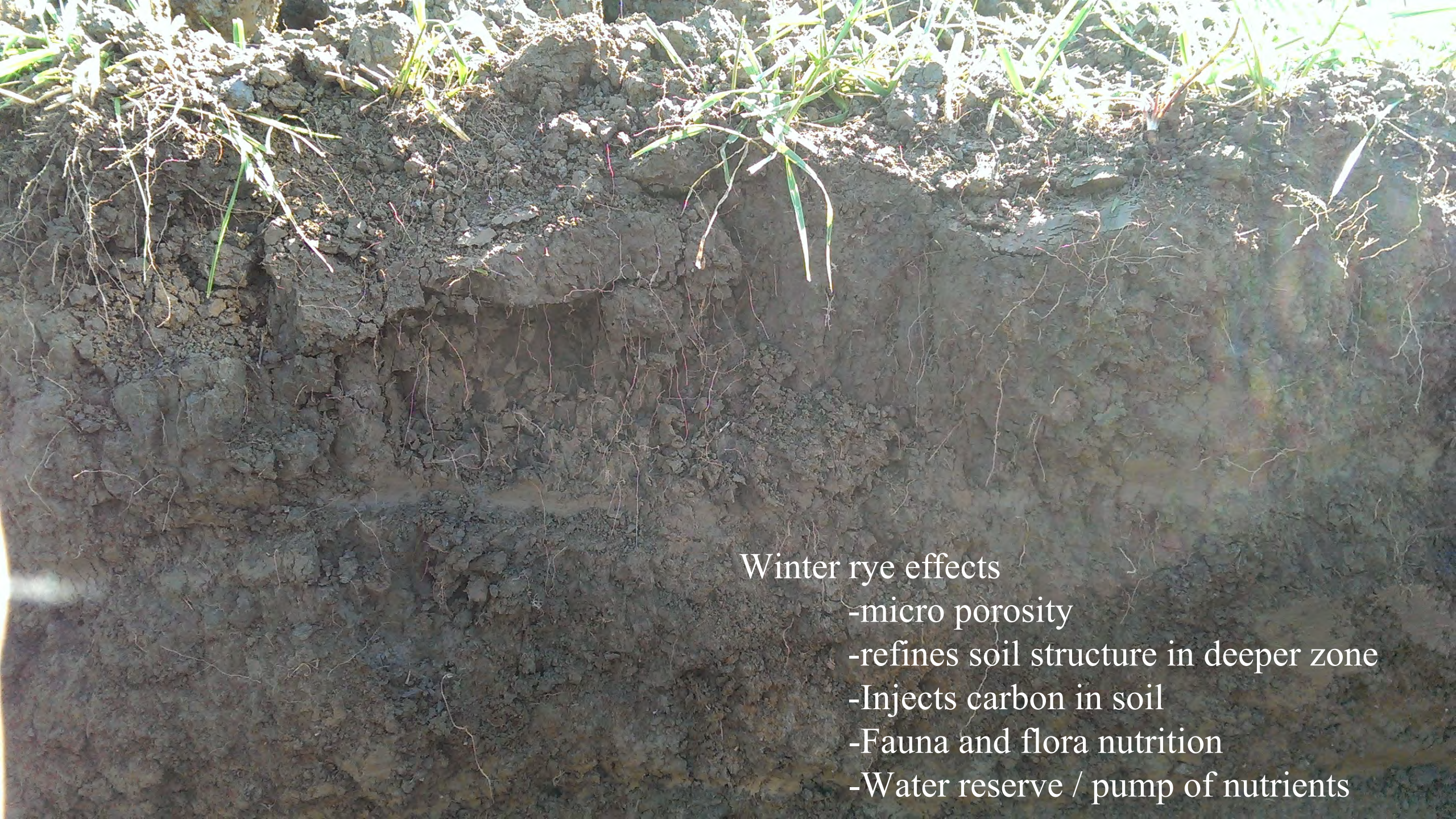
-Root: maximum pressure
-Bad water infiltration
-Decrease of microbial population
-Elimination of some species
-Considerably less biodiversity (fauna/ flora)

It's the Apocalypse



Pressure exerted by roots to penetrate soil and extract nutrients (in PSI)

-Corn 400
-Wheat 350-400
-Barley 450-475
-Alfalfa 600- 675
-Sunflower 600-675

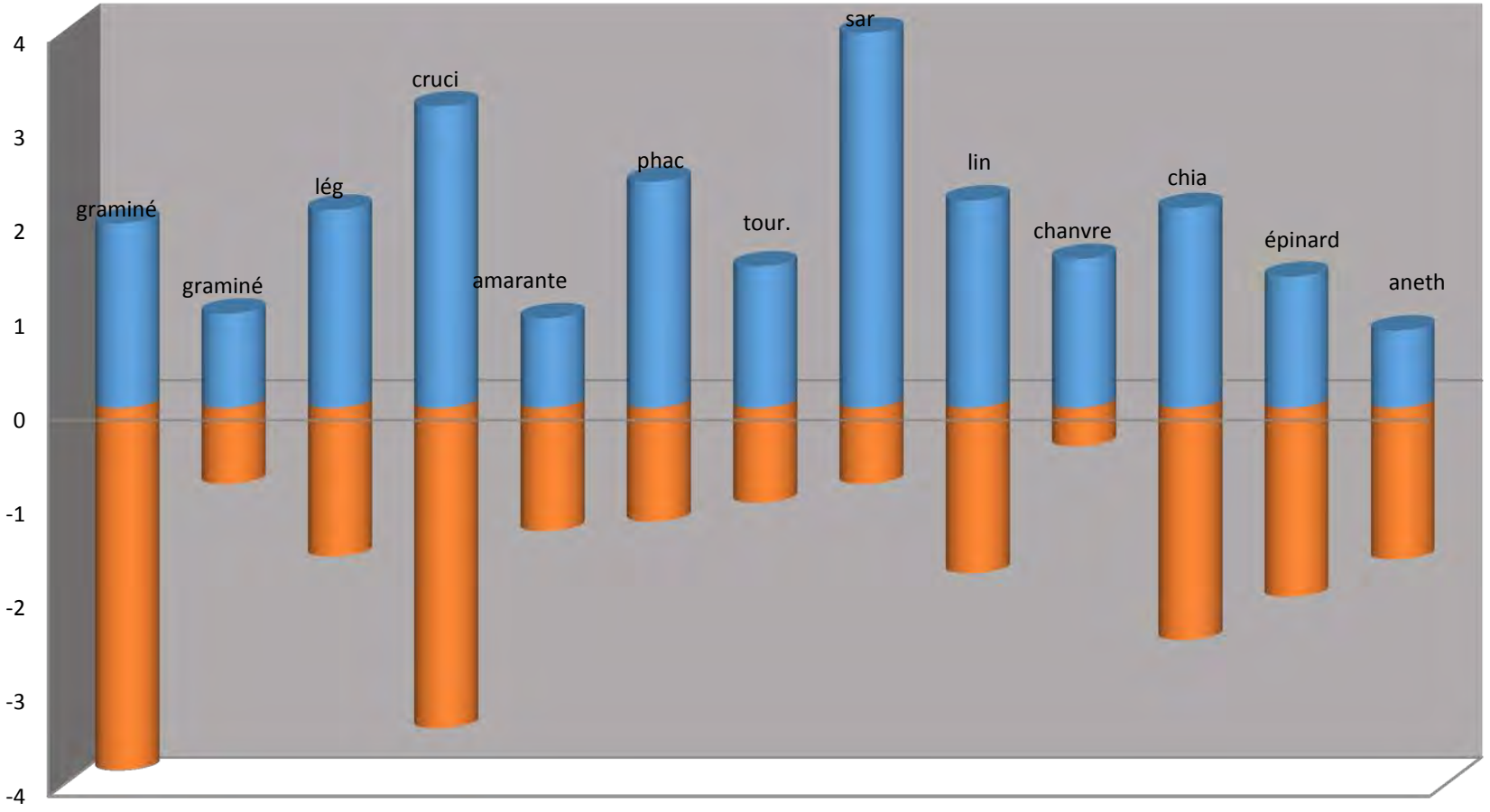

Winter rye effects
-micro porosity
-refines soil structure in deeper zone
-Injects carbon in soil
-Fauna and flora nutrition
-Water reserve / pump of nutrients

INTERSEEDING IN CORN



RESEARCH PLOTS

D.M.T. / Ha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-4
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graminé
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amarante
phac
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sar
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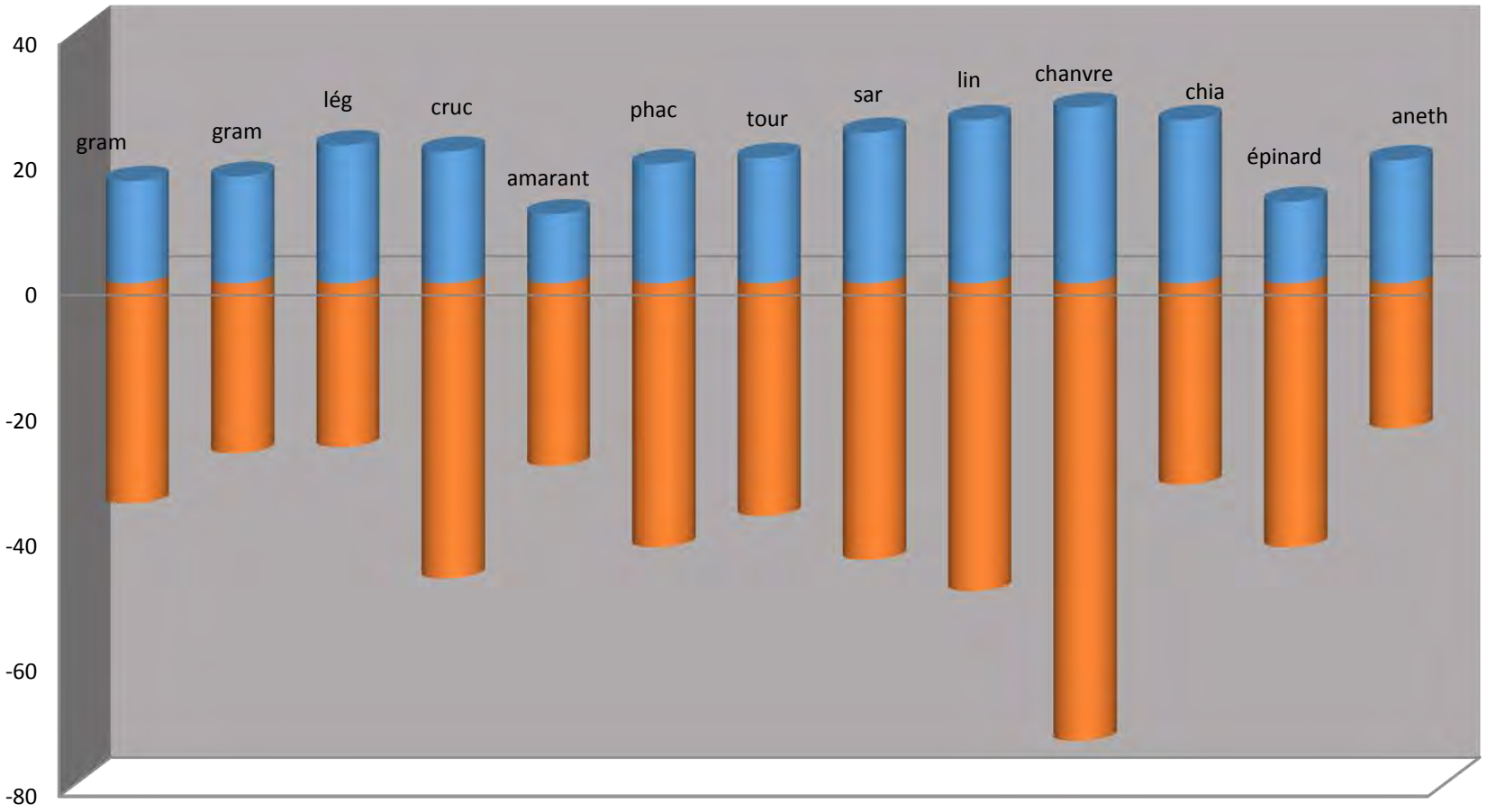
chanvre
chia
épinard
aneth

C/N Ratio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aneth

Types of rotation: always keep in mind to capture as much photosynthesis as possible!

With hay fields:

Hay_CC_Corn/Corn sil+inter_winter rye_ds soybean_winter rye_CC_Hay

Without cereals:

Hay_CC_Corn/Corn sil+inter_winter rye_ds soybean_winter rye_CC_Frost seeded hay

Yesterday……

Today


BIODIVERSITY