

# Understanding impact of soil biology on crops: the key to sustainability of farming system

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# GASSLER SAS & Formation - France



Alfred Gässler  
Farmer  
Consultant  
Courses

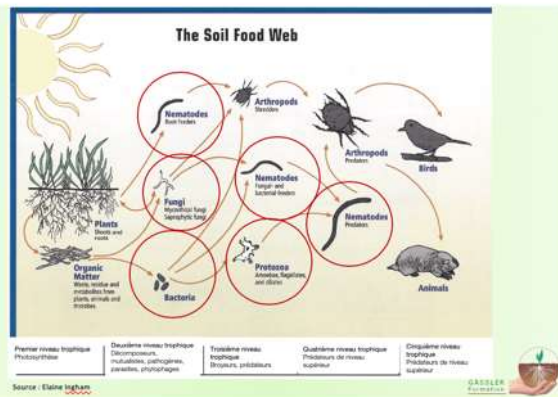
Marie-Thérèse Gässler  
Agricultural Engineer  
Farmer  
Soil analysis : biology



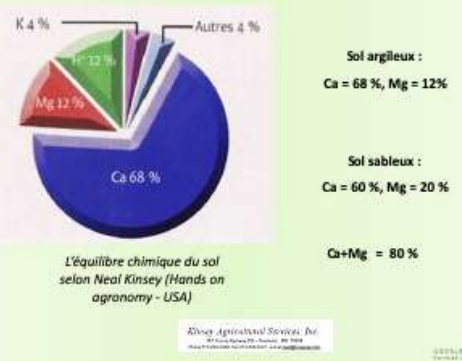


# Our work with farmers : from scientific findings to agricultural management

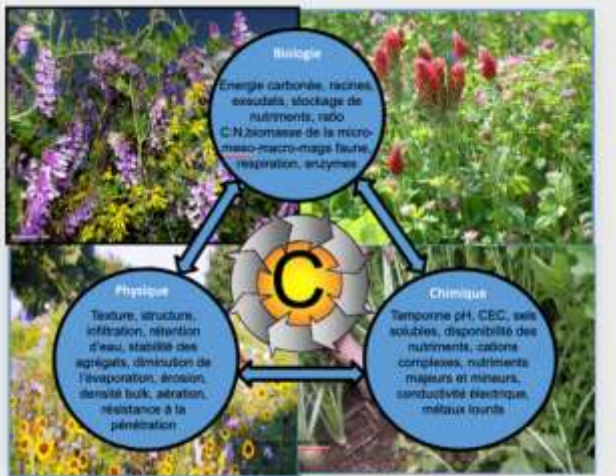
## Le réseau trophique



## Equilibre chimique du sol selon Neal Kinsey/Albrecht

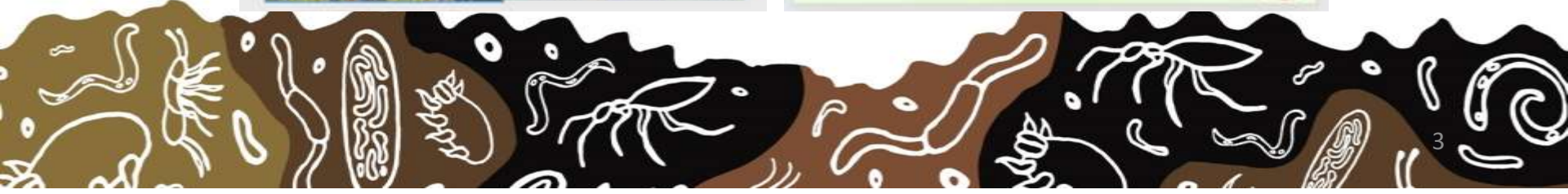


## Pyramide de la santé de la plante, selon John Kempf



## Mélange d'espèces pour semer dans une culture

Espèces	Kg/ha / Espèces
Pâturin des prés	4
Fétuque des prés	2
Ray gras anglais	3
Ray gras Italie	1
Trèfle violet	1
Lotier	2
Minette	3
Trèfle incarnat	1
Dose total à l'ha	17





# Our work with farmers / farmers association



# Our goals

## Us as farmers :

- Conservation agriculture system since 1989 : no till and cover crop
  - Sustainable soil management
- What we are looking for :
  - Healthy soils
  - Healthy food
  - Good Family living
  - Production in quantity and quality for citizens
- Trials
- Link Science and Farming systemic experience
  - Theory and Practice

## Us as consultant and actively involved with farmers associations (APAD, GCAN...)

- Trials on bigger scales
- Disseminating our results and technics
- Give tools to monitor and evaluate the systems
  - Soil analysis : physical, chemical and biological
  - Plant analysis : chemical





# The soil chromatography

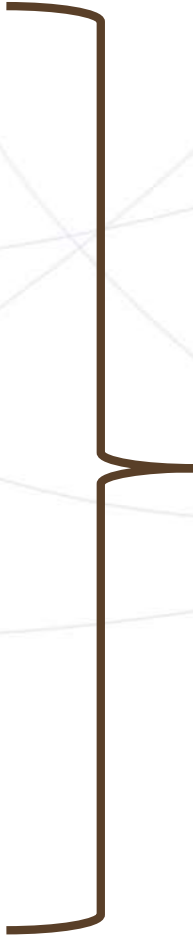
*E. Pfeiffer and Lübke*



# Aims of soil chromatography

## Estimation of the quality of soil biology

- Oxygen levels
  - Aerobic / anaerobic
  - Structure & porosity
- Bacterial activity
  - Diversity and quantity
  - Are nutrients tied up
- Fungal activity
  - Diversity and quantity
- Soil evolution



A lot of information in one analysis  
Qualitative assessment



# The « reading »



- Colour
- Structure
- Areas
- Evolution





# A tool for farmers



A stone : no life



# A tool for farmers

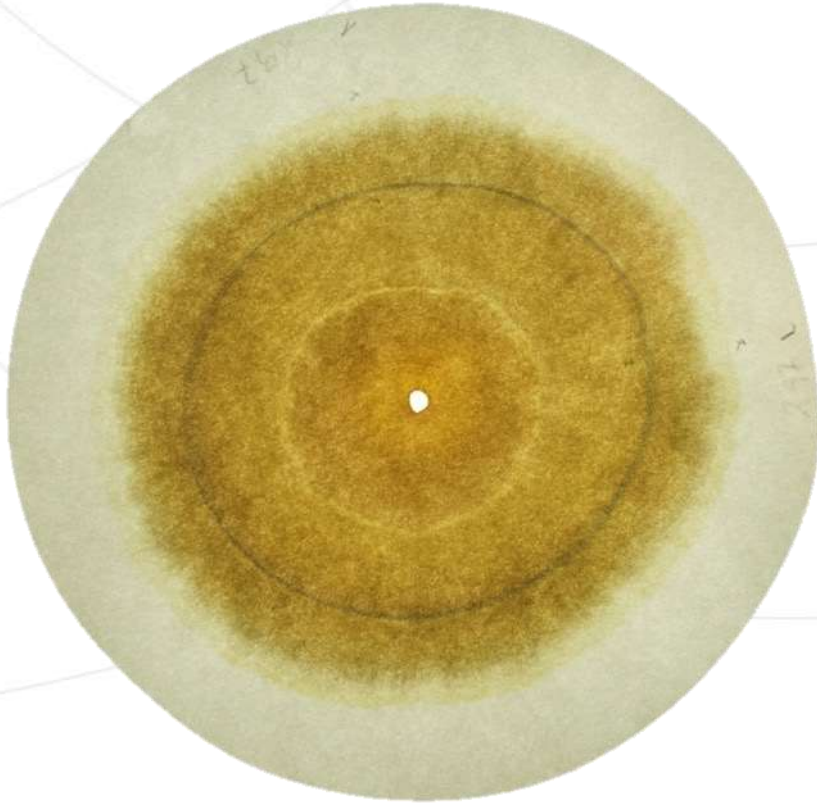


A pasture : biologically active





# A tool for farmers



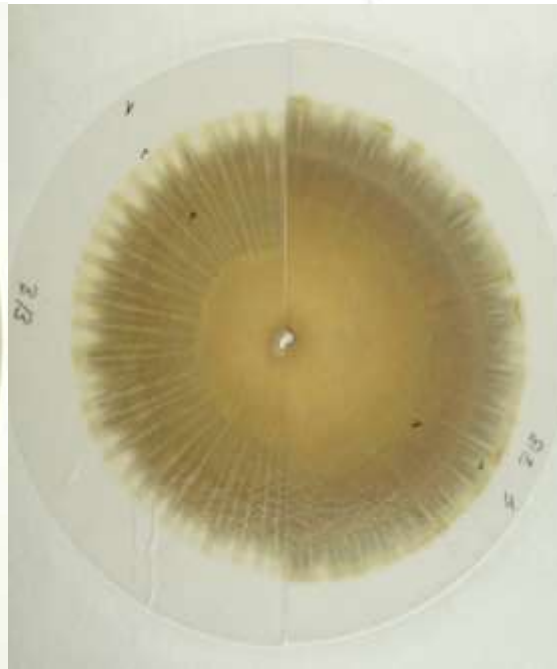
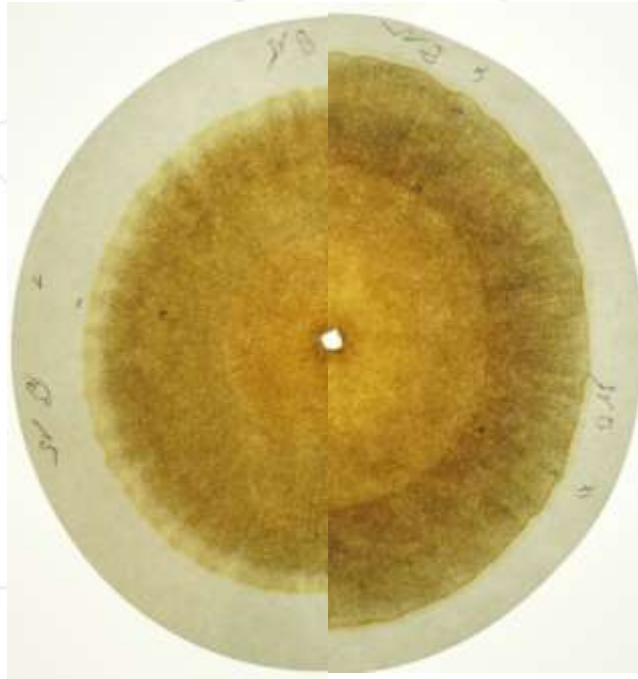
A stone : no life



A pasture : biologically active



# The way of farming matters



**Ploughing, no cover crops**

**Ploughing + cover crops**

**No till + cover crop**





# The way of farming matters



**Conventional  
Tillage**



**Conservation agriculture  
No-till and good & diverse cover crop**





# The way of farming matters



**Conventional**

95 % of annual crops in Europe



**Conservation agriculture**





Why is it important to be able to assess?



# Clocher 2013 - 2016



15 years of no till and cover crops  
( poor biology)



3 years later : practice improvements  
(good biology)



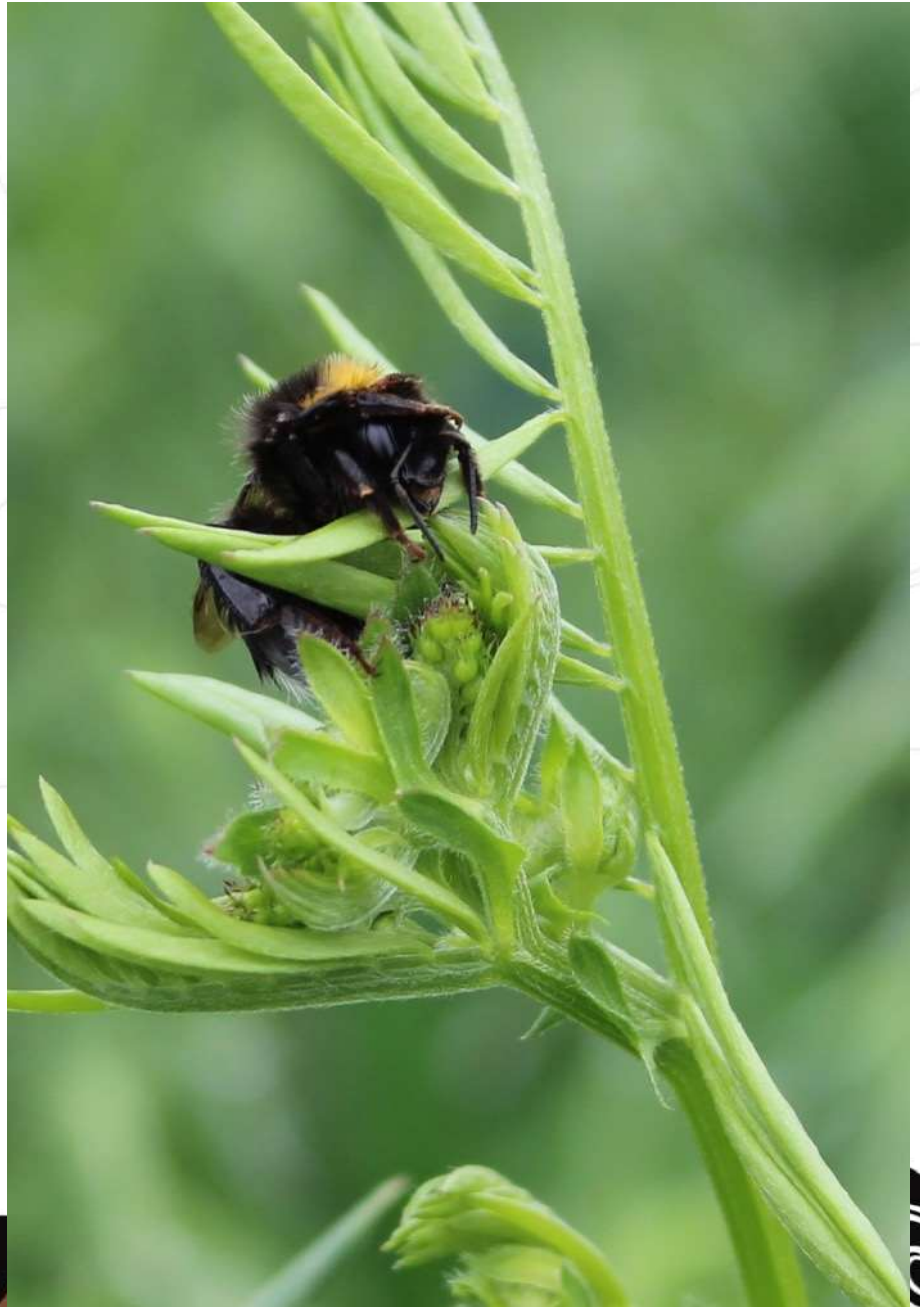




What changed?









# Keep your soil alive



Permanent soil cover  
No bare soils



Diversity of species  
Rotation & cover crops mix  
Cover crop quality



No soil disturbance  
No-Till



# Long term aims

- Compare different systems
- Compare different environment : regions, lands ...
- Compare to physical and chemical analysis
- Compare to the crop quality
- Give the method a notation → Quantitative assessment





# Conclusion

There is still a lot to do !

- Need to work with the scientists
- Reduce the gap between scientific trials and farmer fields
- Link the scientific work to the farmers
- Make it more accessible and comprehensible
- ✓ That should be the aim of our farmers associations like APAD, GCAN ...



# LET'S WORK TOGETHER !



## THANK YOU

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