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AGRICULTURAL RESEARCH FOR DEVELOPMENT

GECO
Agroecology ★ Banana ★ Plantain ★ Pineapple

Interreg
Caraïbes
Fonds européen de développement régional

UNION EUROPÉENNE

Weeds managment

Theoretical modul

Steewy LAKHIA

Plan

- General introduction
- Impact on the production tool
  - The staff
  - The environment
- Objective of weed management
- Alternatives management
  - Plants: cover crop and spontaneous
  - Mechanization
  - Mulching
  - Service animals

General introduction

- Banana monoculture

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Weed Management

- Control that does not impact soil fertility or banana plantation yield
- Alternatives management
  - Cover crop and spontaneous plants
  - Manual selection and mechanical management
  - Mulching
  - Service animals

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Weeds management in fallow

- Objective in fallow : Limit telluric parasitism
- Elimination of host plants
- Mean : non-host cover crop

Destruction of fallow of *Crotalaria* spp.

Fallow of *Crotalaria* spp.

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Weeds management in cultivation

- Aim : limit competition of weeds with the banana tree
- Mean : herbicides
- Impacts :
  - Bare soil→ runoff and erosion
  - Pollution of groundwater and watercourses
  - Appearance of resistance
  - Health of workers
  - Loss of biodiversity

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Alternative management

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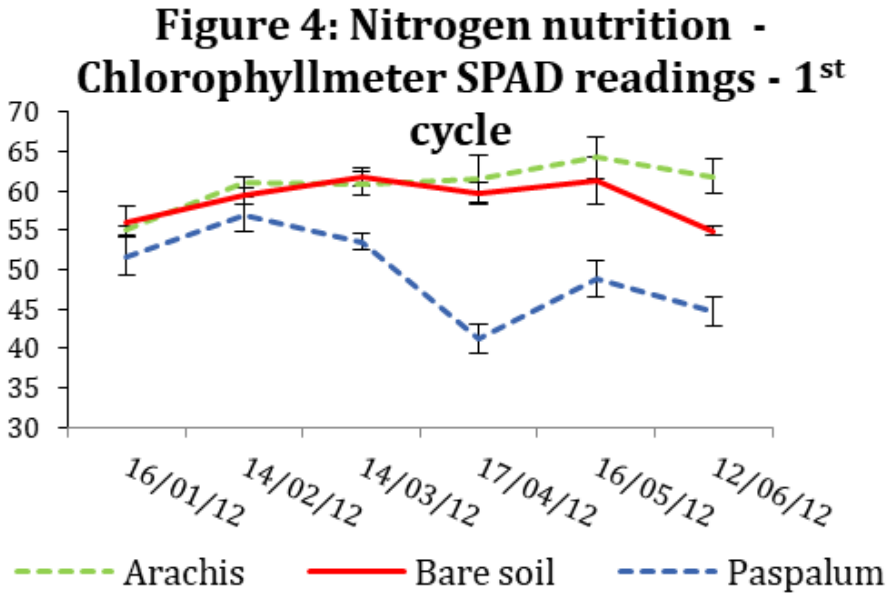
Cover crop and spontaneous

- Characteristics
  - Legume or poaceae
- Services rendered
  - Weeds control
  - Soil protection (runoff and erosion)
  - Habitat for macrofauna
  - Contributes to the fertility of the plot (legume)
- Constraints
  - Competition with the banana tree
  - Supply of seeds
  - Need of soil preparation and seeding equipment



Chlorophyll SPAD index revealed better nitrogen nutrition on bare soil and on Arachis pintoi cover than on Paspalum notatum cover

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Choice of cover crop

- Non-host of nematodes :
  - *Radopholus S.*
  - *Pratinlychus C.*
  - *Méolidogine I.*
- Fast growing
  - Poace faster to install than legumes

Radopholus similis

Mix of *Desmodium and Crotalaria*

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Mechanical weed control

Rotary mower hitched to a micro-tractor

- Topography : plain
- Difficulty of use : easy
- Efficiency : good
- Day yield : 2 ha
- Price : 25000 - 30000$

Hand held portable brush cutter

- Topography : moutain
- Difficulty of use : hight
- Efficiency : good
- Day yield : 1/3 ha
- Price : 700$

Alternative for family farms : Manual selection weeding of undesirable plants: lianas (*Mikania micrantha, Ipomeae* sp.) and perennial grass (*Brachiaria mutica*).

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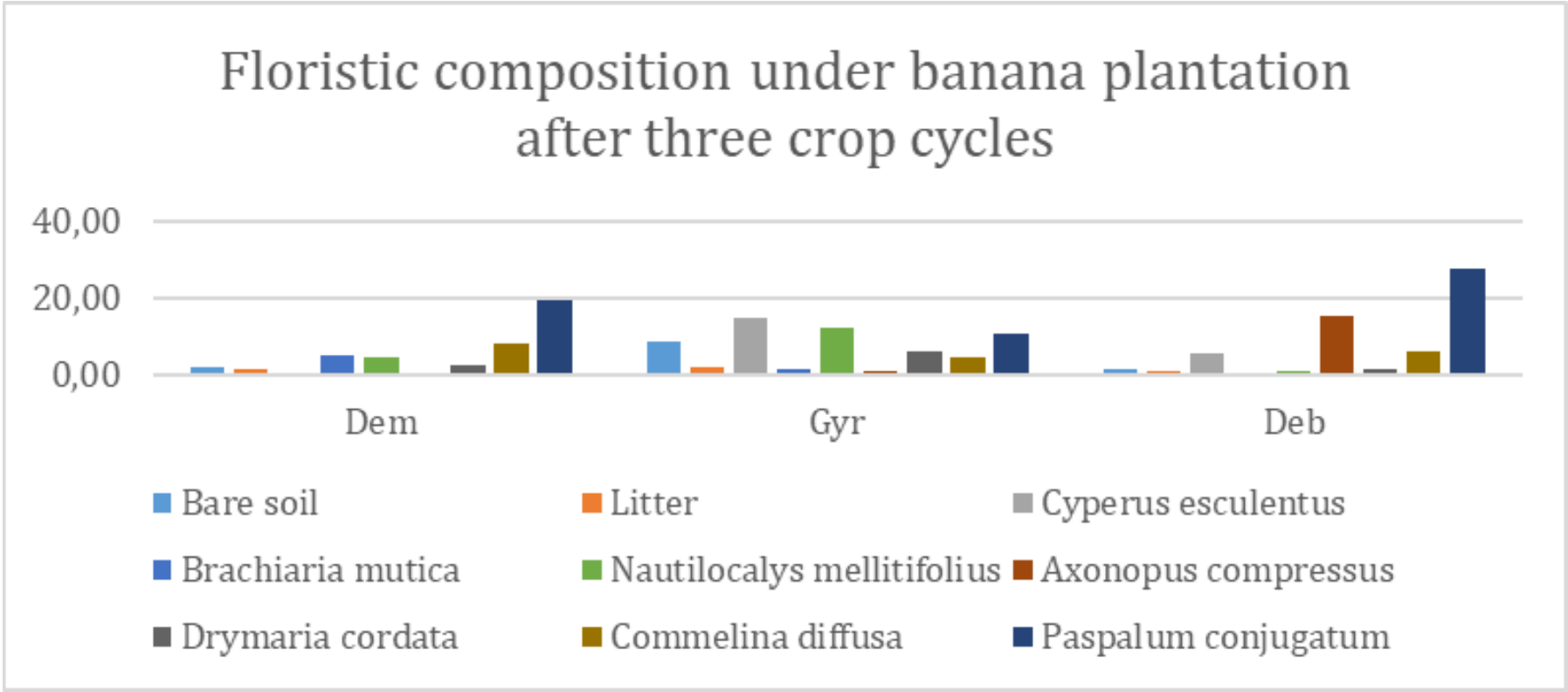
Impacts

- Impacts on floristic composition :
  - Mecanical managment (rotary mower hitched and brush cutter) select creeping grass (Deb end Gyr)
  - Rotary mower hitched cause areas of bare soil (Gyr)



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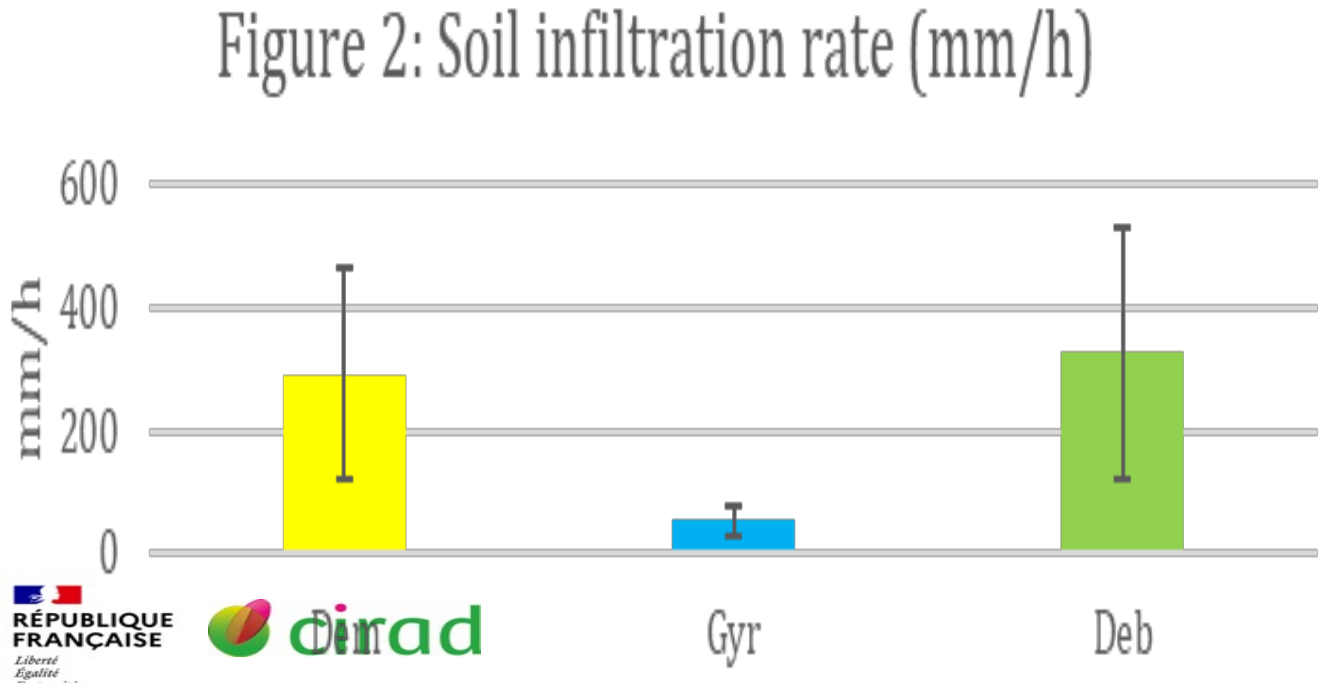
Impact

- Impact on soil fertility
  - Repetition of low-presure tires of micro tractor reduced water infiltration (Gyr)



Although the mowing was carried out using lightweight machinery equipped with low-pressure tires, the repetition of their passage in frequently wet conditions and the impact of the mower blade on the irregularities of the soil surface caused topsoil structure degradation and reduced the rate of water infiltration.

This soil structure degradation can impair root functioning and increase runoff and erosion risks.

Mechanical innovation

- Topography : moutain
- Difficulty of use : hight
- Efficiency : good
- Day yield : 2 ha
- Price : 70000$

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Mulching

- Caracteristics :
  - Polypropylene ground cloth (130g 5,25 m black) 5,55€/m linear
  - Recyclable and reusable
- Service rendered
  - Weed control
- Constraints :
  - Cause bare soil phase
  - Decrease of the macrofauna population
- Note
  - Ineffective on lianas and bulb plants

The cloth held to the ground by staples

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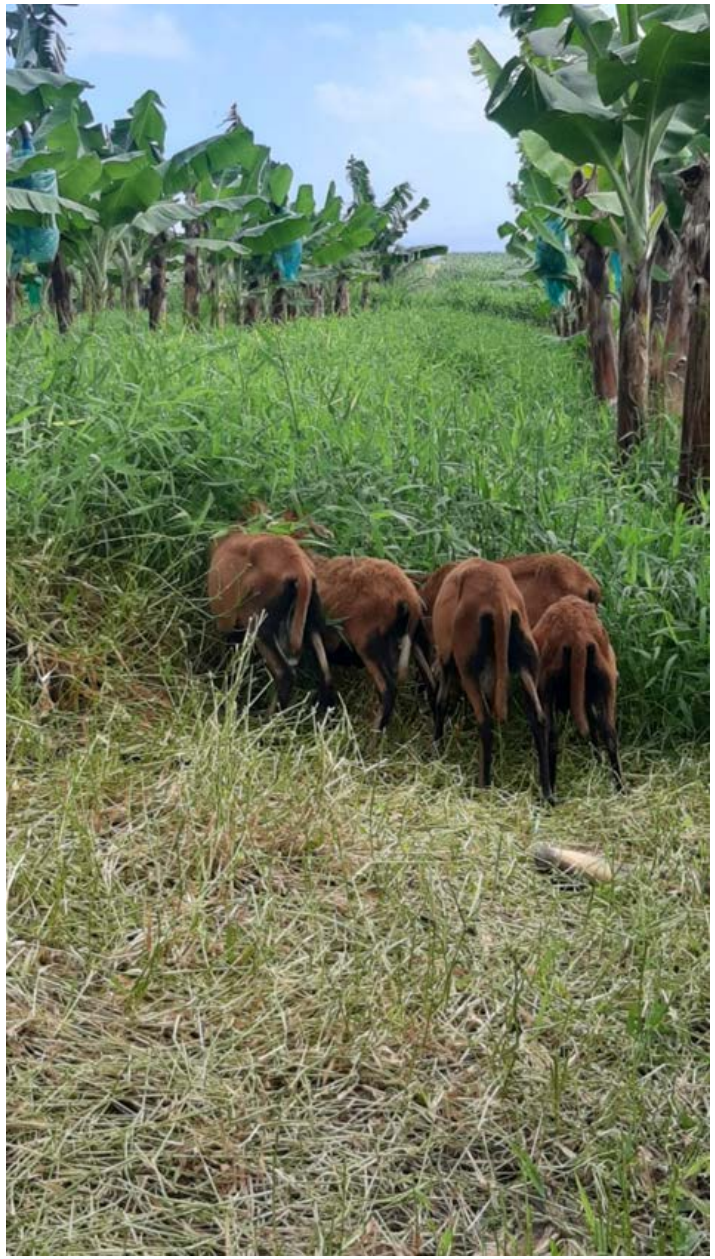
Service animals



- Sheep:
  - 10 sheep/ha
  - Rotational grazing

- Geese:
  - 100 geese/ha
  - grazing

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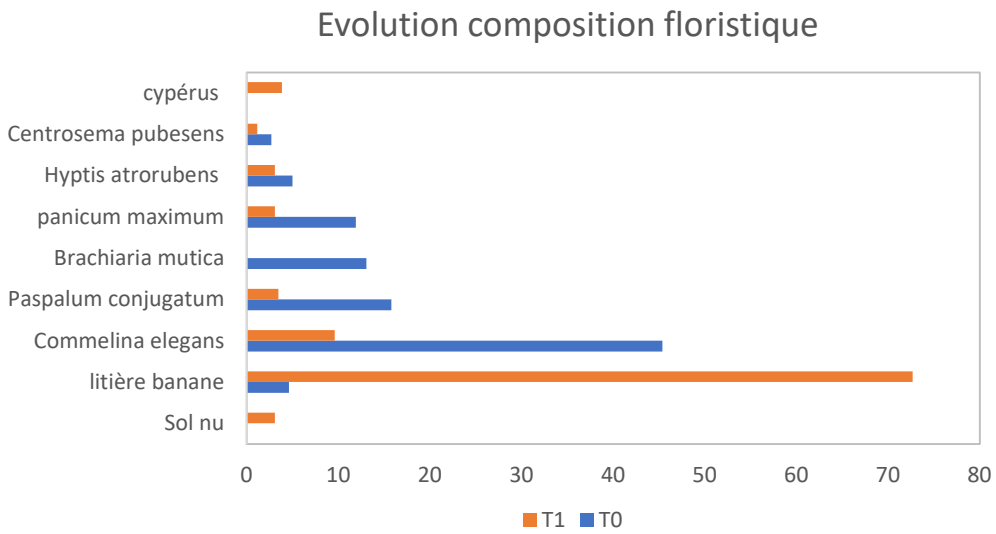
Sheep

- Biomass reduction de 60%
- Average daily earnings > 100g/day



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Conclusion

The miracle solution does not exist. It is necessary to find a compromise according to the constraints of its exploitation

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Thanks you !!!

Grasias !!!

Mèssi on pil !!!

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