

# PHENOTYPING TOOLS FOR BEETS

Avec  
la contribution  
financière du compte  
d'affectation spéciale  
développement  
agricole et rural  
CASDAR

  
**MINISTÈRE  
DE L'AGRICULTURE  
ET DE L'ALIMENTATION**  
*Liberté  
Égalité  
Fraternité*



INTERNATIONAL INSTITUTE  
OF SUGAR BEET RESEARCH



Institut Technique  
de la **Betterave**

François Joudelat – 21/06/2022

Phenotyping tools for beets :

- LITERAL : a compact, human-borne tool



- CERCOCAP : an IoT project for disease management



# The need for tool diversity

Not all trials can be efficiently phenotyped  
with the same tools

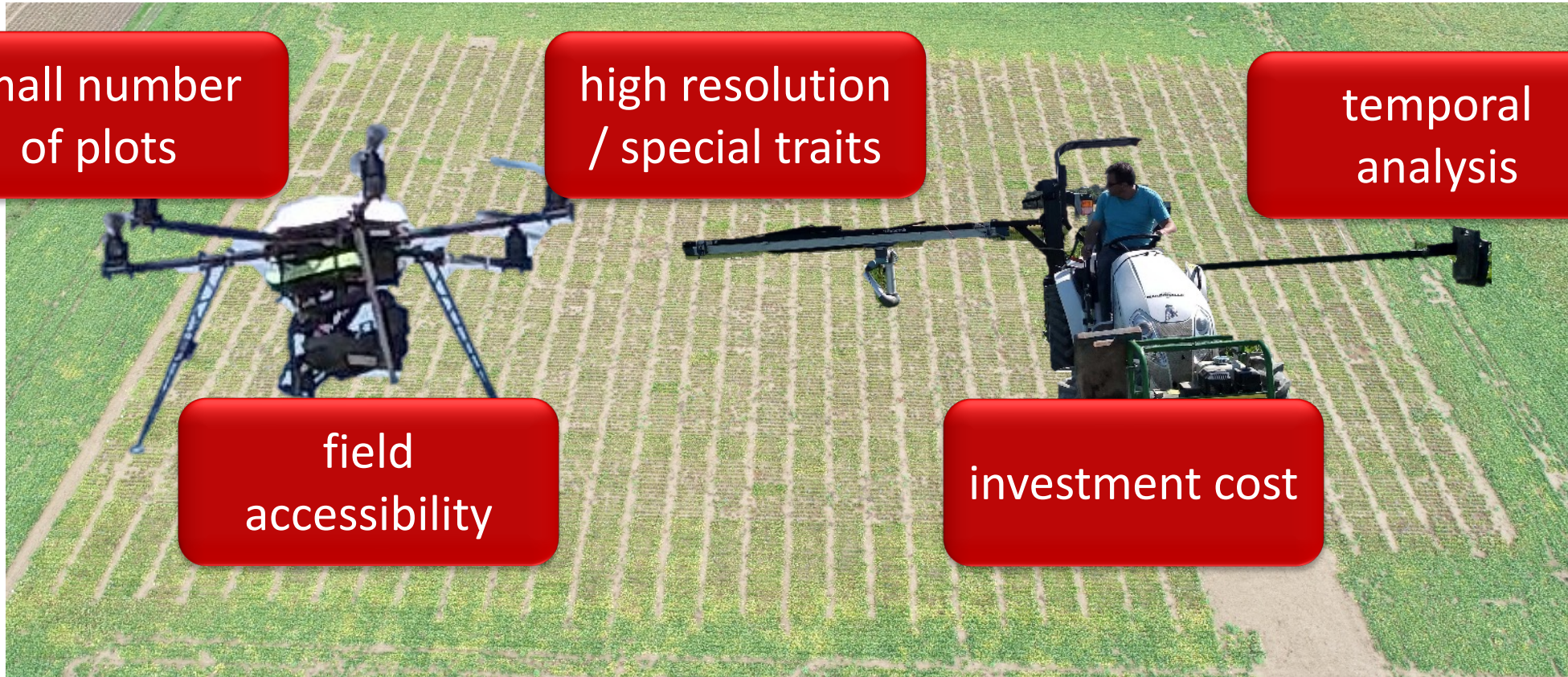
small number  
of plots

high resolution  
/ special traits

temporal  
analysis

field  
accessibility

investment cost

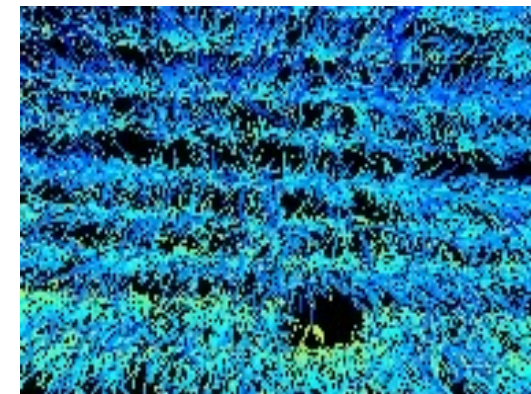
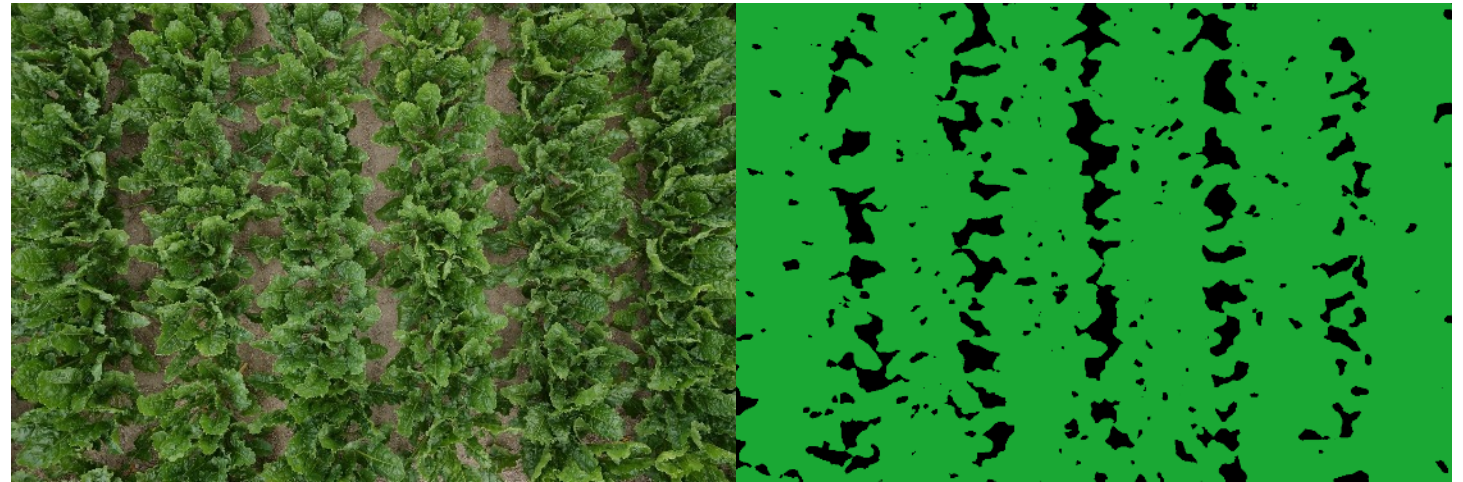


- A project for several crops : beet, cereals, rapeseed, flax, sunflower, apple trees, ...
- Simple setup
- Human-borne

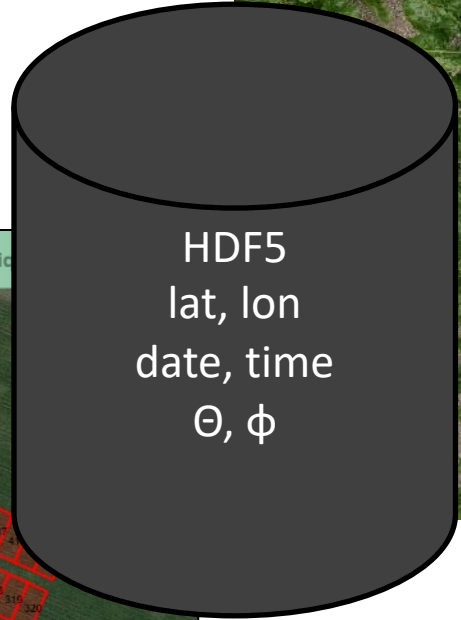




- Modules for processing
- Various traits
  - Green fraction ...
  - Organs counting...
  - 3D measurements...
  - Biochemical content...



- Various utilities
- Streamlined data management



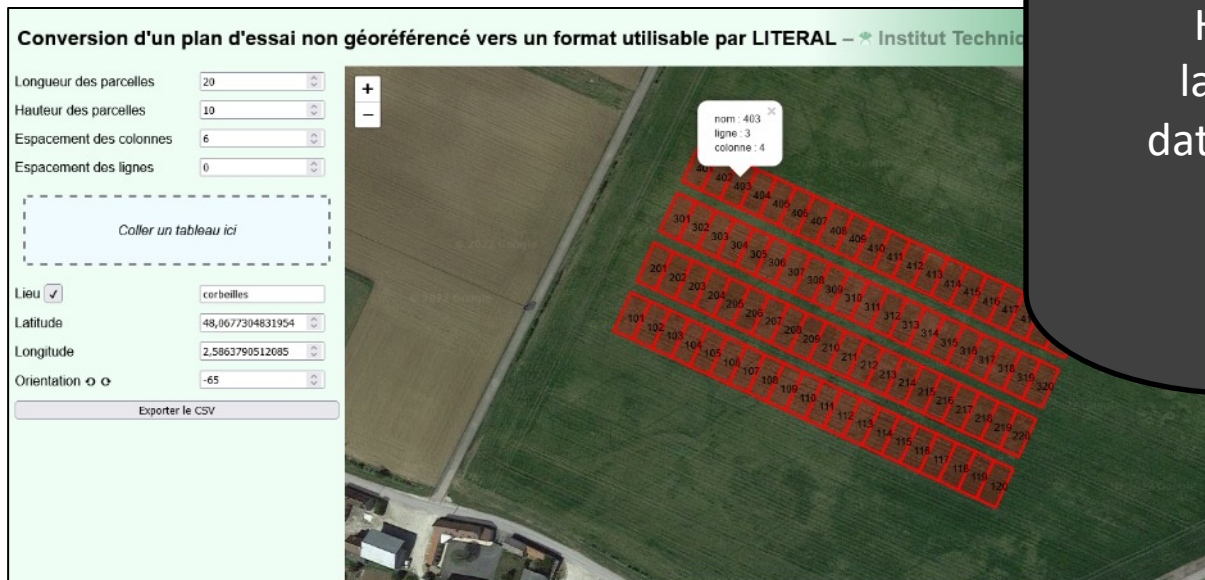
Conversion d'un plan d'essai non géoréférencé vers un format utilisable par LITERAL – Institut Technic

Longueur des parcelles: 20  
Hauteur des parcelles: 10  
Espacement des colonnes: 6  
Espacement des lignes: 0

Coller un tableau ici

Lieu  corbeilles  
Latitude: 48,0677304831954  
Longitude: 2,5863790512085  
Orientation  $\theta$ : -65

Exporter le CSV



What about temporal monitoring ?

- High frequency
- High resolution
- Few plots

→ IoT sensors : connected cameras

CERCOCAP : disease modeling

with surveillance coupling

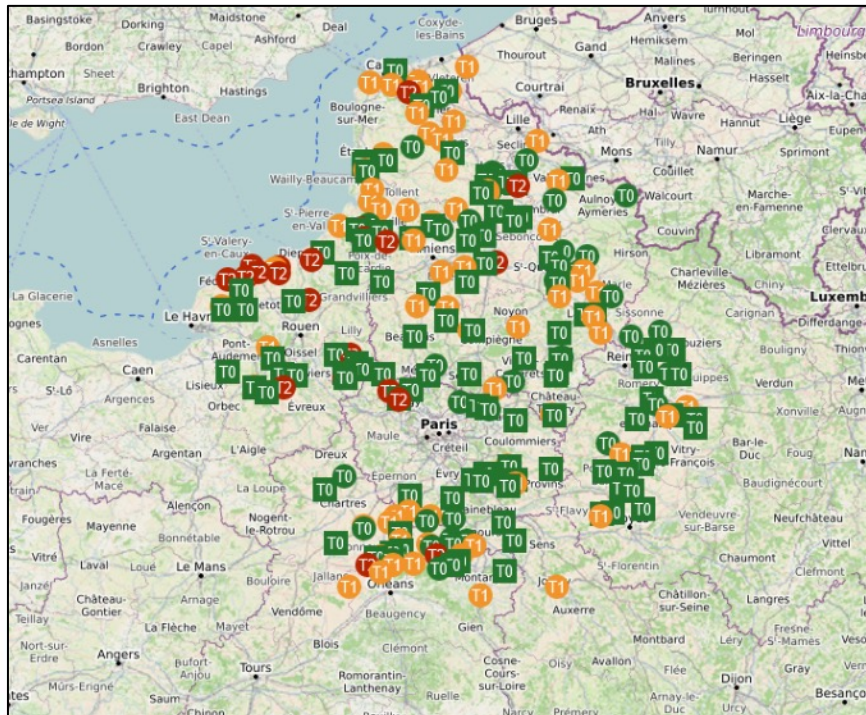
- High resolution (5MP)
- Several shots / day
- 3G transfer

➔ Automated solution





- Images of the top of canopy
  - Data for disease quantification
- ➔ Enhance classic monitoring



# Conclusion & perspectives

Specific needs

balance

Versatile & ergonomic solutions

Automated monitoring challenge :

- Trap plant for pests (weevils)
  - Susceptible varieties for diseases
- Early warning for farmers



Thanks for your attention  
& your questions

for more details :

