

From soil biological fertility to potato health

How to combine agroecological farming practices in a field experiment?

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Study context

- 2018: 2 cropping systems are implemented in Brittany (France), based on 2 different tillage practices

Conventional tillage
(annual ploughing)

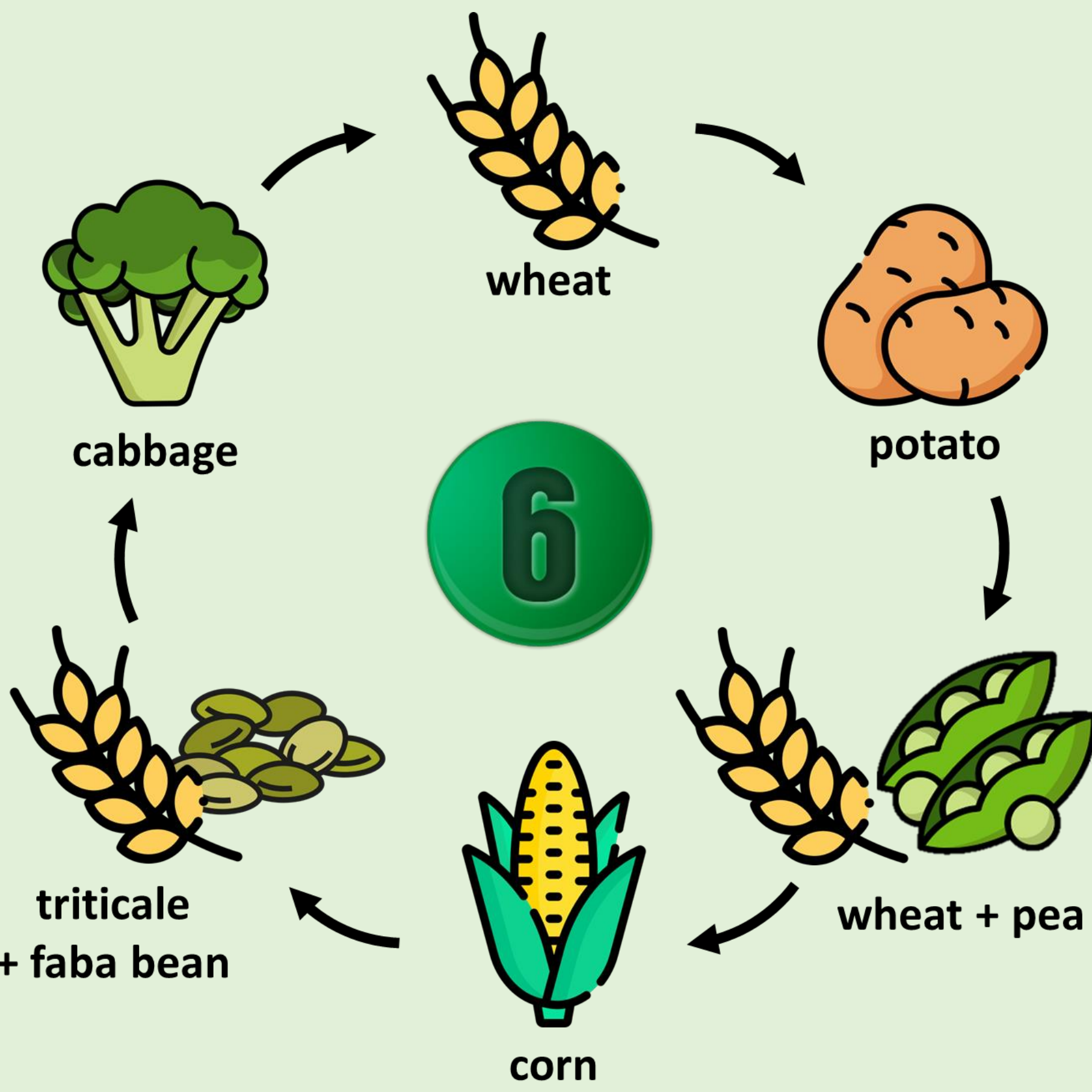


Alternative tillage
(no ploughing)

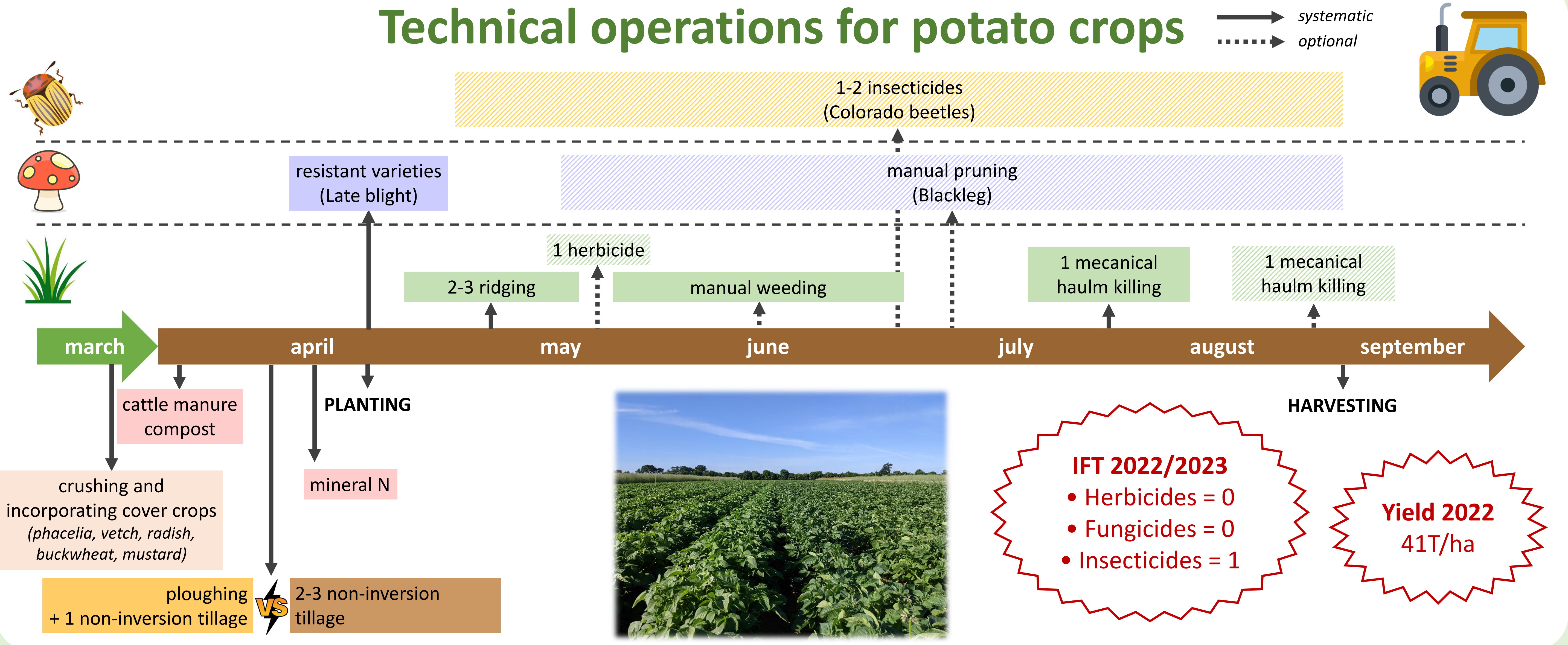
- 6 years crop rotation
- Very low amount of pesticides (only used as a last resort)
- 2 different varieties selected for their low susceptibility to Late blight
- Similar to farming production system (study field = 3ha)

Goal of this long-term experiment

To study the effect of tillage system on soil biological fertility and potato health

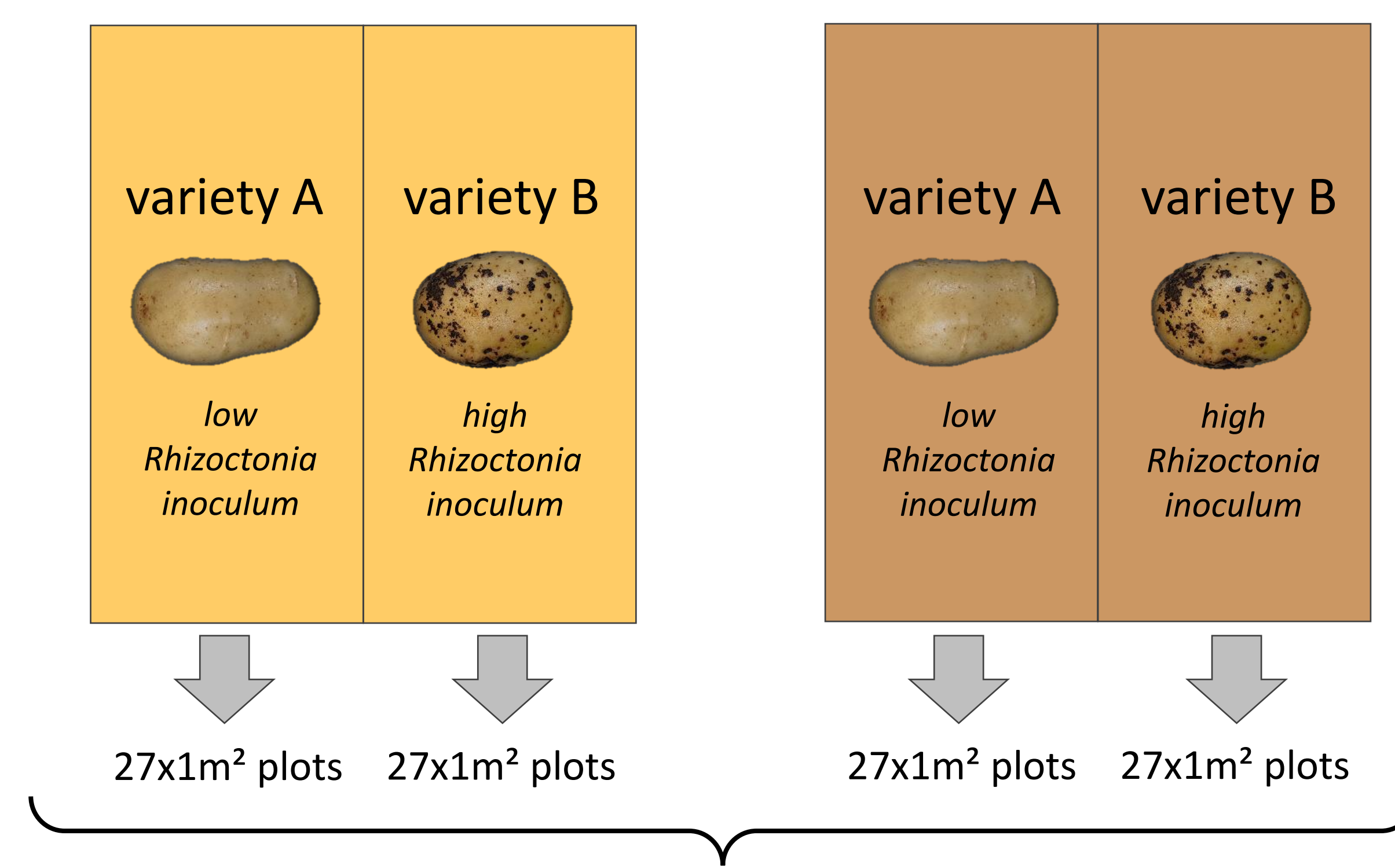


Technical operations for potato crops



Experiment design 2022-2023-2024

Field 1: annual ploughing (0,5ha) Field 2 : no ploughing (0,5ha)



Incidence and the severity of pests and diseases:

- Weekly scoring of pests and airborne diseases : colorado beetles, aphids, wireworms, late blight, blackleg, viruses, early blight, black scurf.
- At harvest, scoring of soilborne diseases and pests : common scab, black scurf, drycore, black dot, silver scurf and wireworms.

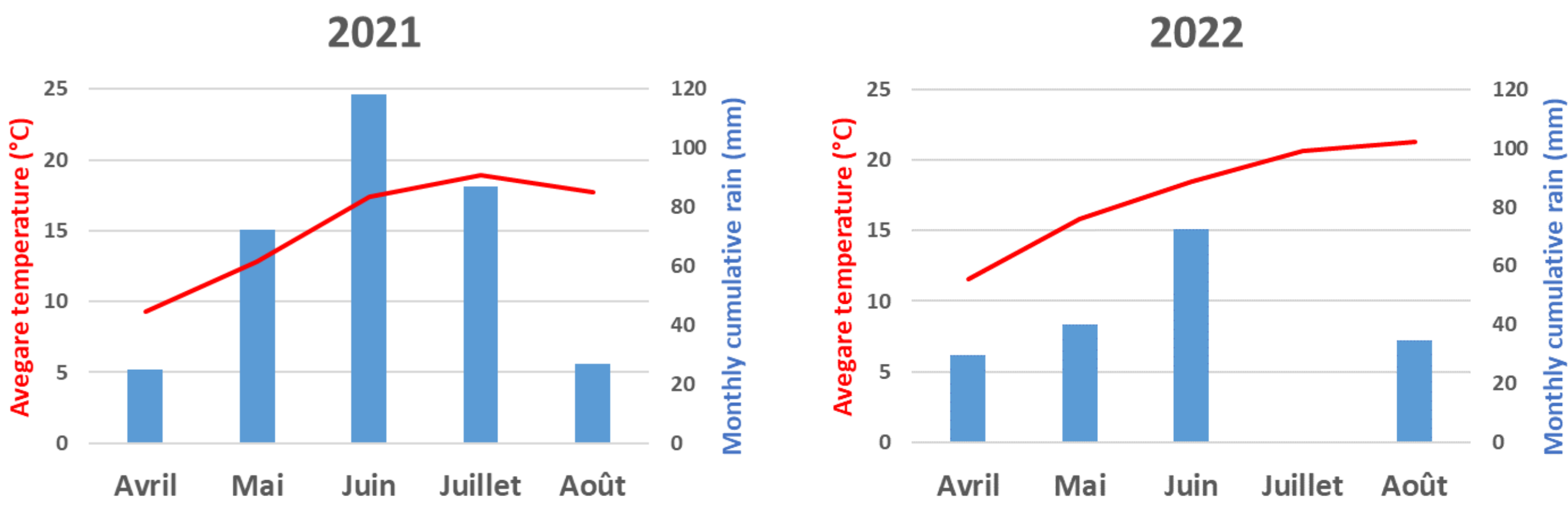
Soil biological fertility:

- Abundance, diversity and activity of macrofauna (arthropods, earthworms), mesofauna (mites, springtails), microfauna (nematodes) and microorganisms
- Soil stability



Main observations*

Weather conditions



Main biological results

- Trend for a **higher regulation** of some potato diseases and pests **in the no ploughing field** (common scab, black scurf, colorado beetle)
- Trend for a **higher biological fertility in the no ploughing field** (earthworms, macrofauna, nematodes, microbial biomass, decomposition speed of organic matter, soil stability)
- **Interaction** with variety and initial inoculum on tubers (for black scurf)
- Results depend on the year and **must be confirmed**

* Complete results are detailed by A. Kroner in an oral communication (session 5 - Integrative approaches)