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Branched broomrape (*Phelipanche ramosa* (L.) Pomel) is a parasitic plant that infects many crop and weed species. It is a major pest of winter oilseed rape in France.

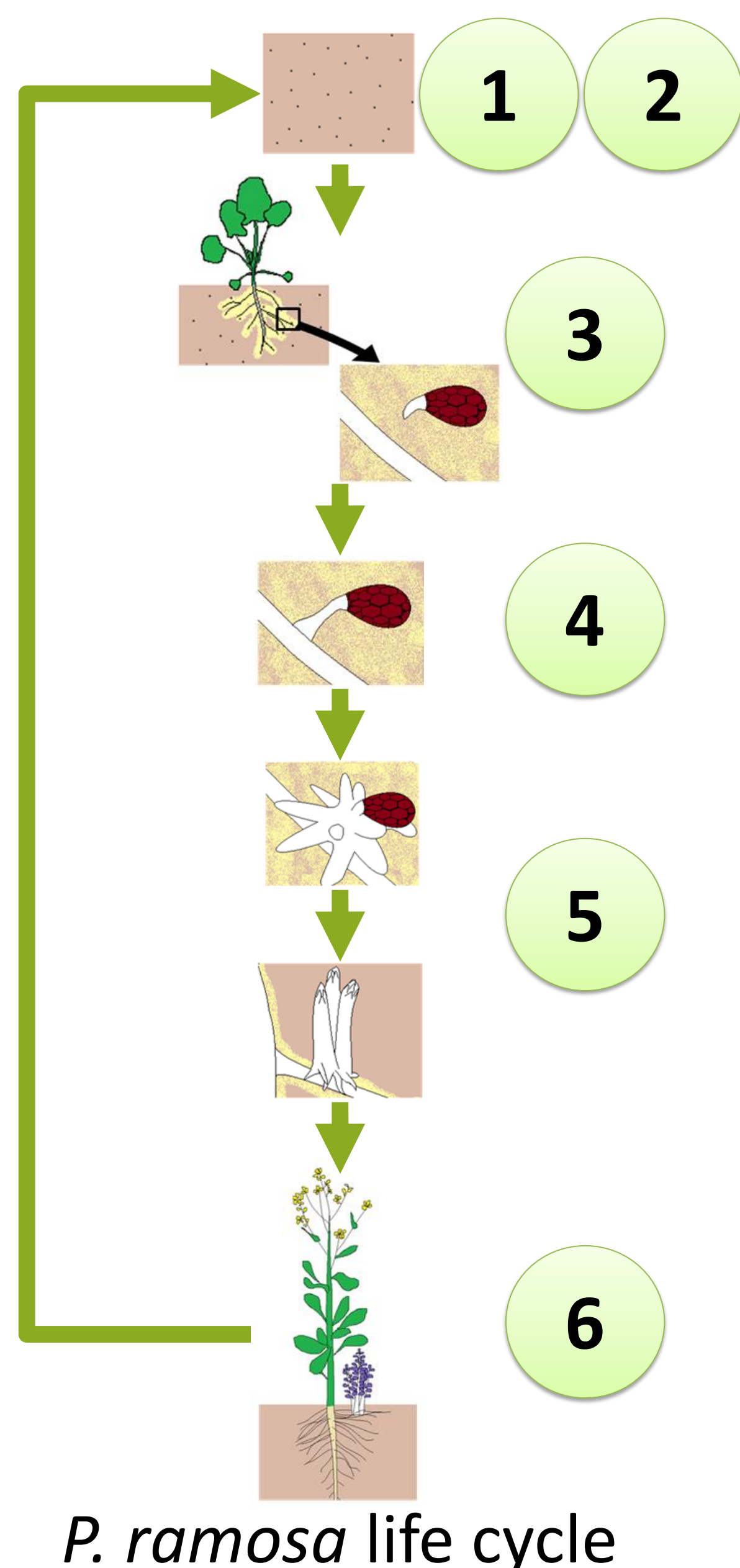
➔ **Objectives** : To model the effects of cropping systems on *P. ramosa* dynamics in interaction with weeds and crops in order to design efficient pest management strategies.

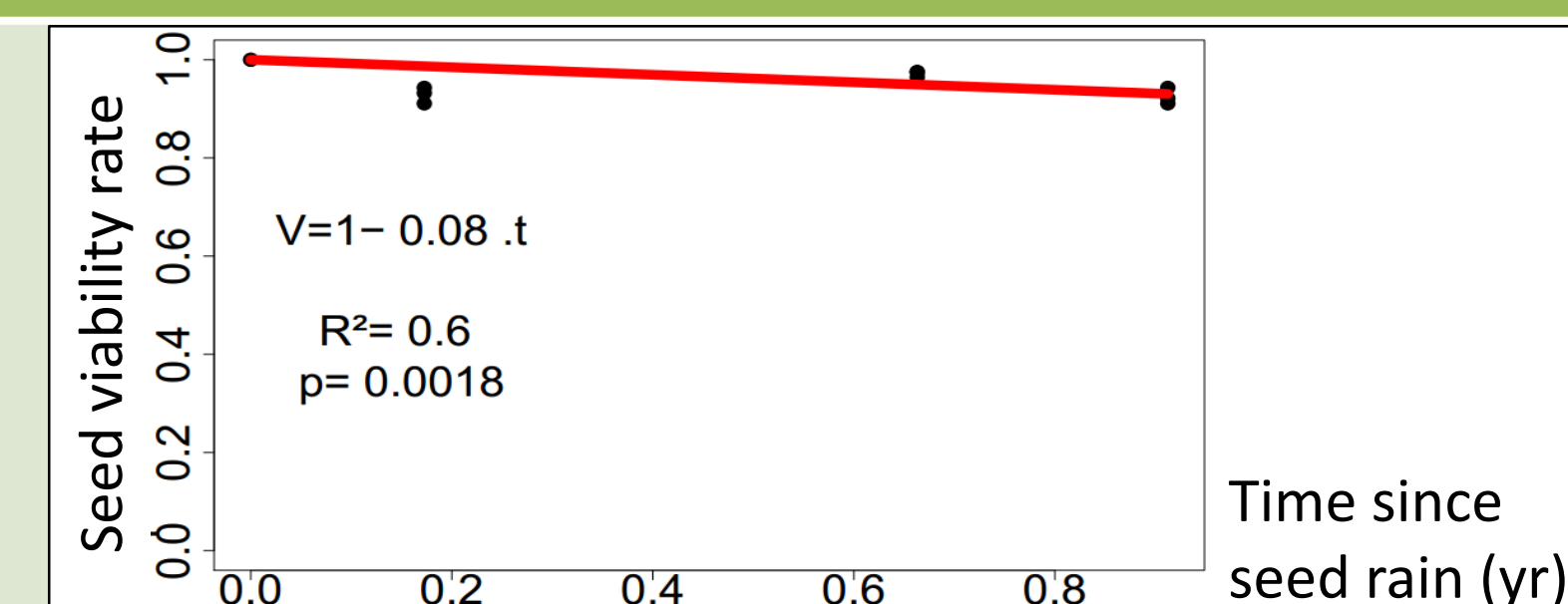
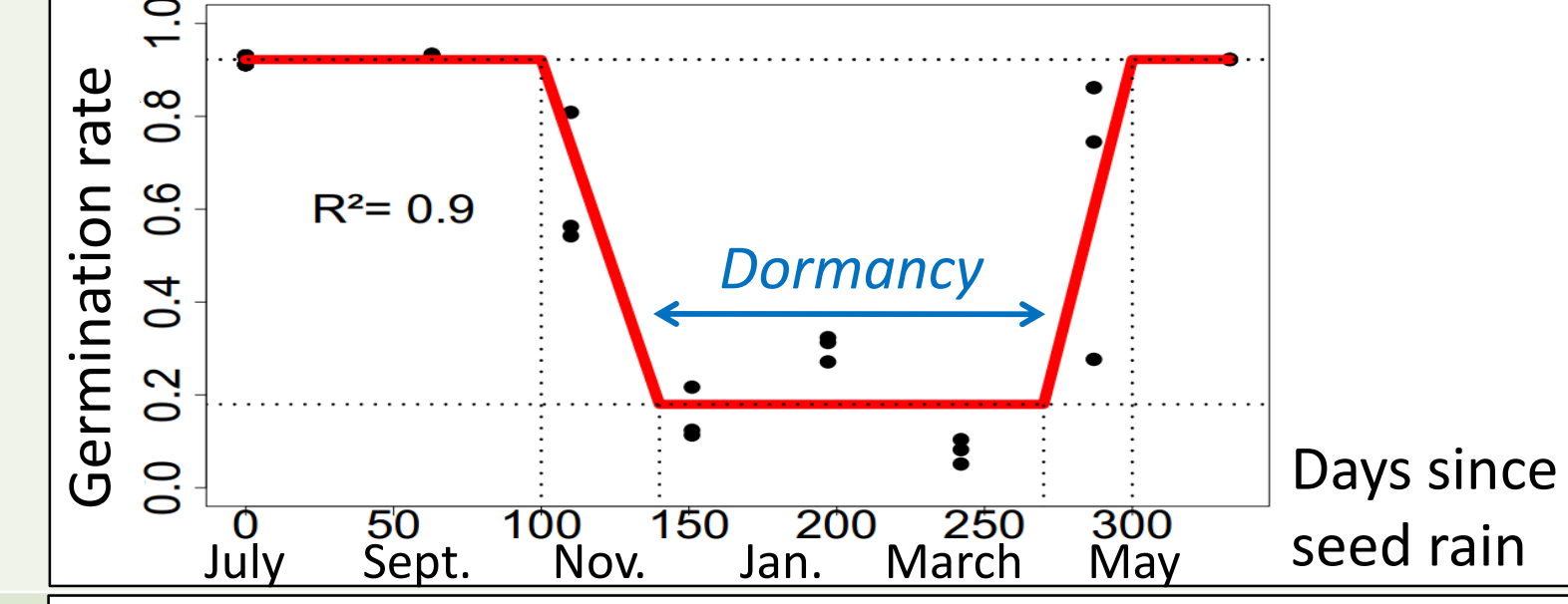
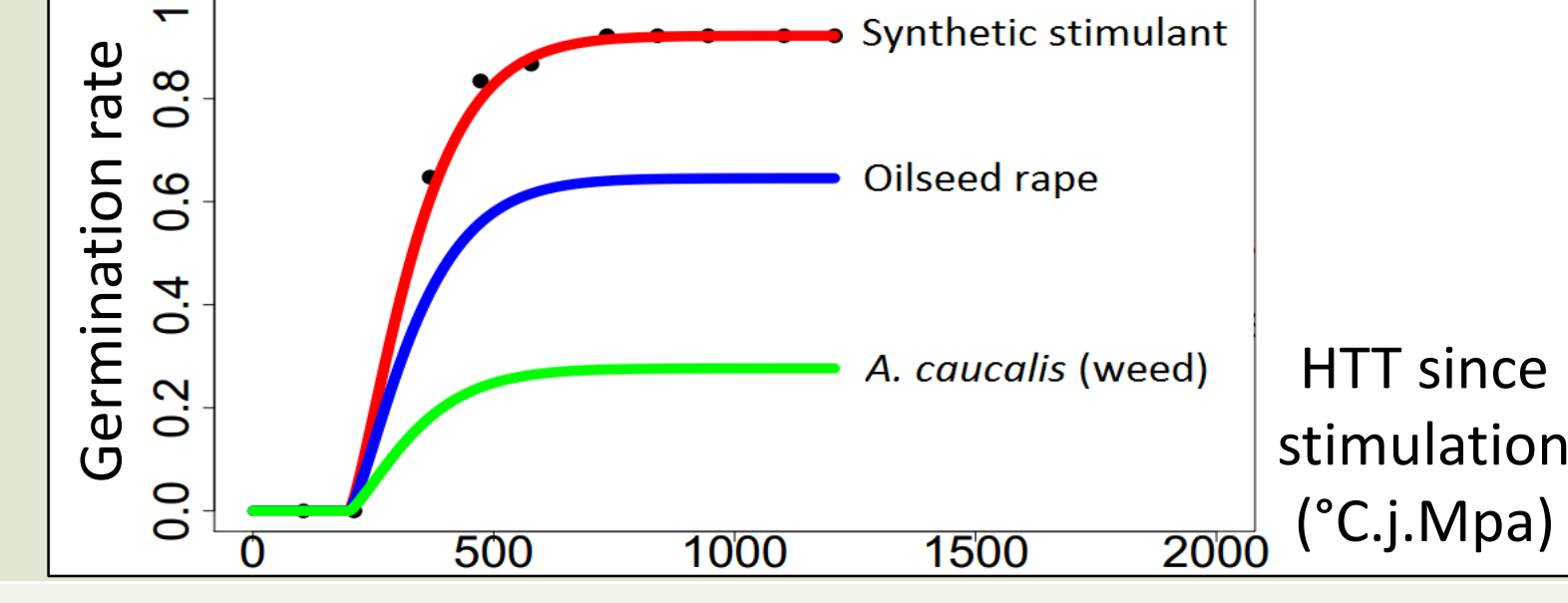
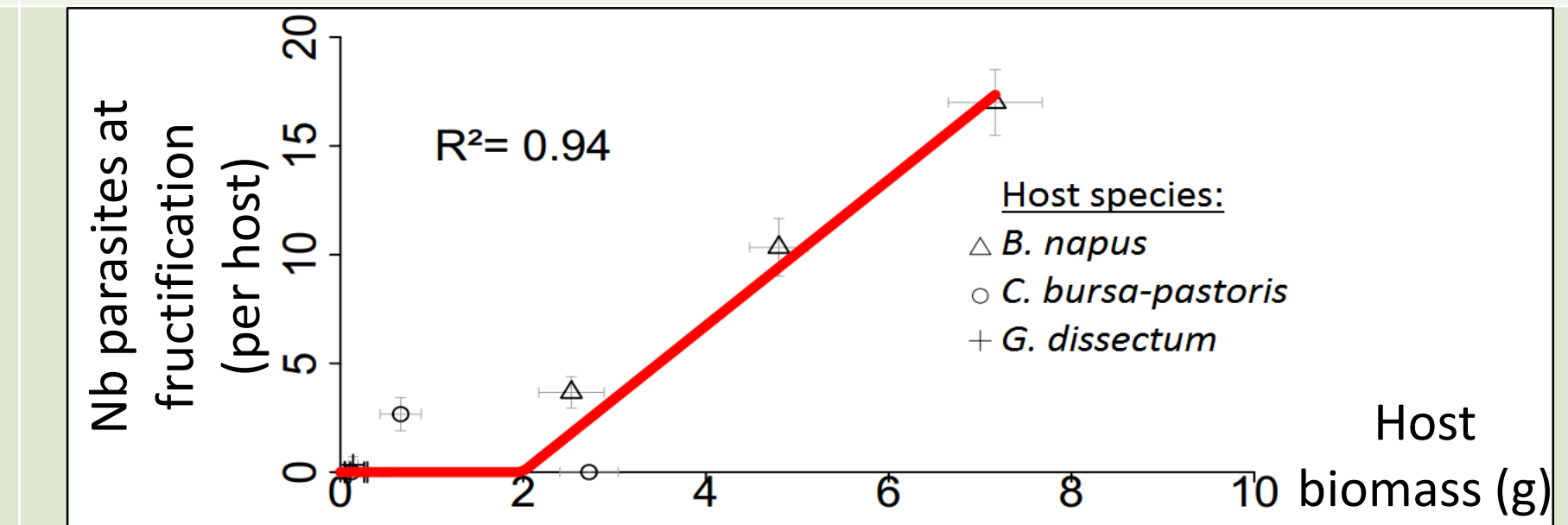
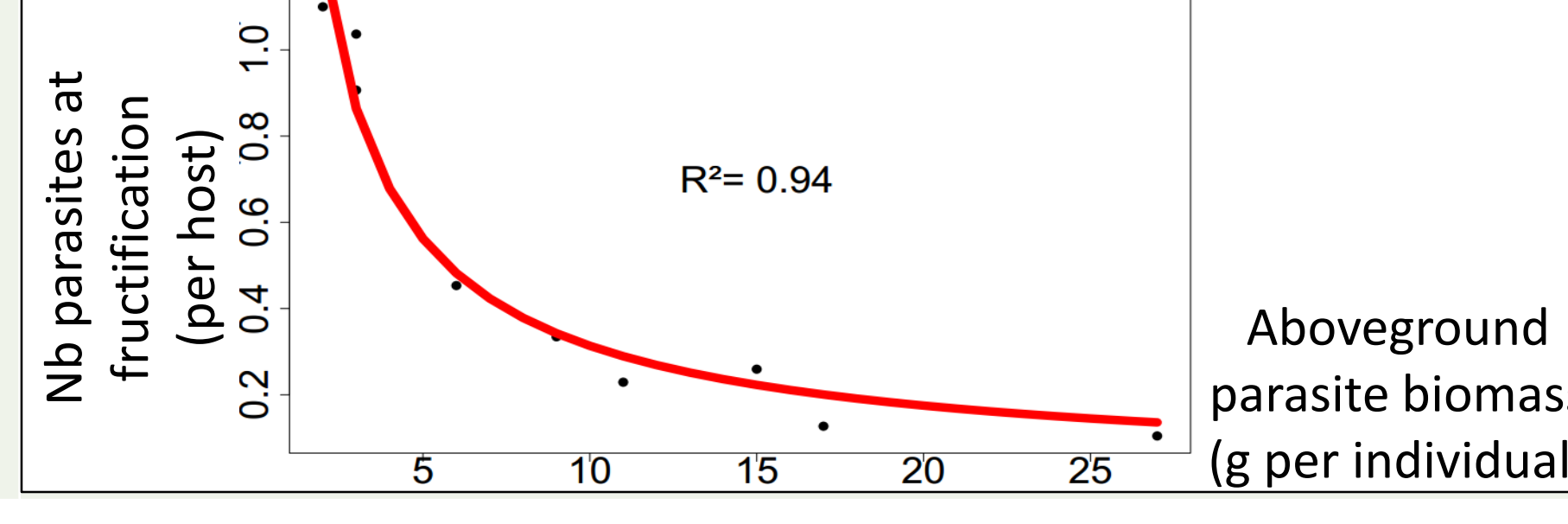
Materials & Methods

- Process-based modelling of *P. ramosa* dynamics as a succession of processes of its life-cycle
- Daily time-step
- Functions and parameters based on literature and experiments

Results

PHERASYS = model of *PHElipanche RAMosa* dynamics in cropping **SYStems** in interaction with weeds



Process	Modelled as a function of	Example
1 In situ seed mortality	• Time since seed rain • Seed age	
2 Seed dormancy	• Days since seed rain • Soil temperature and water potential	
3 Germination (stimulated by host root exudates)	• Stimulating species • Distance from host root • Hydrothermal time (HTT) since stimulation	
4 Attachment on host root	• Distance from host root	
5 Survival on the host to fructification	• Nb. of parasites attached on the host • Host biomass	
6 Seed production and release	• Parasite biomass • Seed/total biomass ratio	

Discussion

- PHERASYS points to potential management improvements:
 - *P. ramosa* seeds display dormancy during winter ➔ delayed crop sowing could reduce infestation
 - Very low annual seed mortality (6-8%) ➔ burying seeds by soil tillage does not deplete seed bank
- Perspectives: to validate the model with field data and to predict parasite effect on crop yield

References

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