

# Modelling the dynamics of biomass production and herbage quality of grasslands according to functional groups composition

R. Baumont, D. Andueza, J. Vuattoux, F. Picard, A. Michaud

INRA, UR1213 Herbivores, 63122 Saint-Genès Champanelle, France



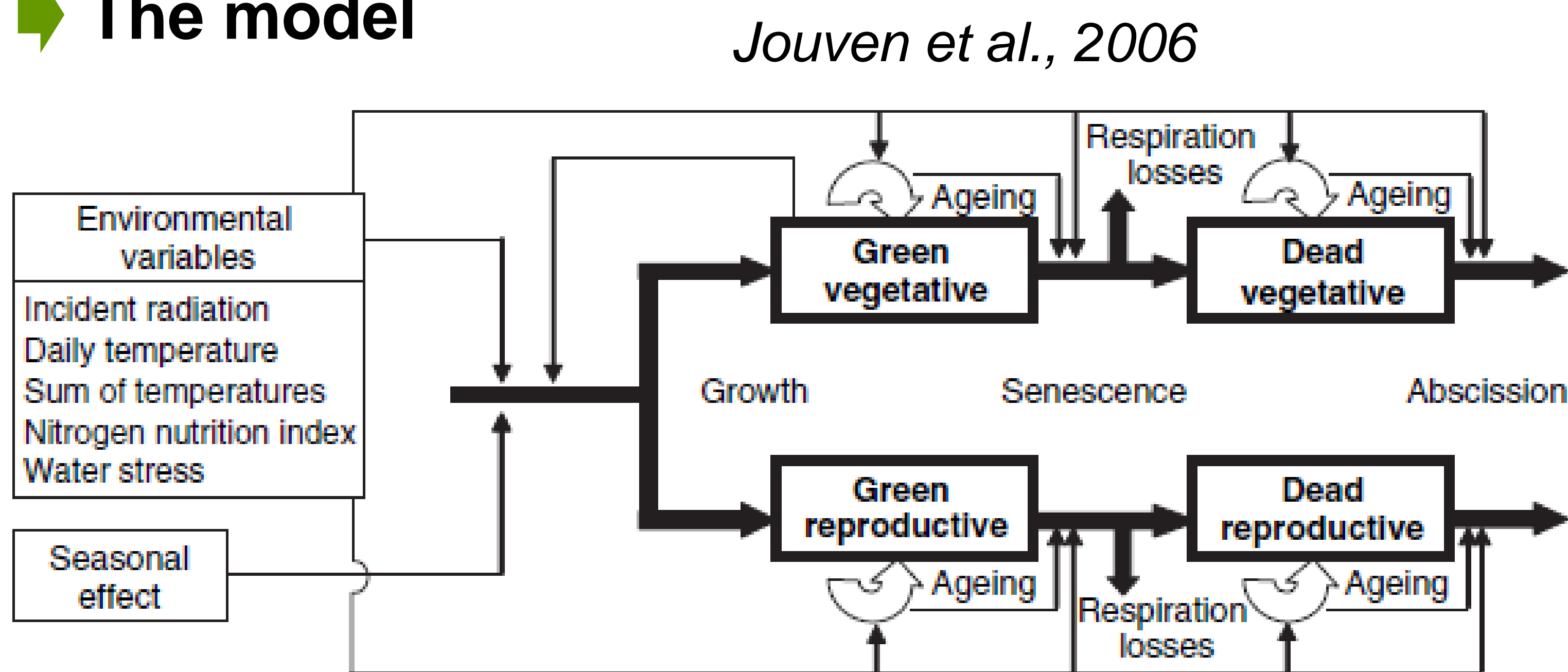
## INTRODUCTION and OBJECTIVE

- The classification of grasses into functional groups according to functional traits was proposed to explain among-grassland variability in biomass production and quality (Cruz *et al.*, 2002)
- We developed a model based on this classification to parameterize the type of grassland and predict the dynamics of herbage biomass, structure and digestibility according to management practices and climate (Jouven *et al.*, 2006).

➔ What is the ability of the model to predict the seasonal dynamics of contrasting grasslands ?

## MATERIAL and METHODS

### ➔ The model



### ➔ Three contrasted grassland plots

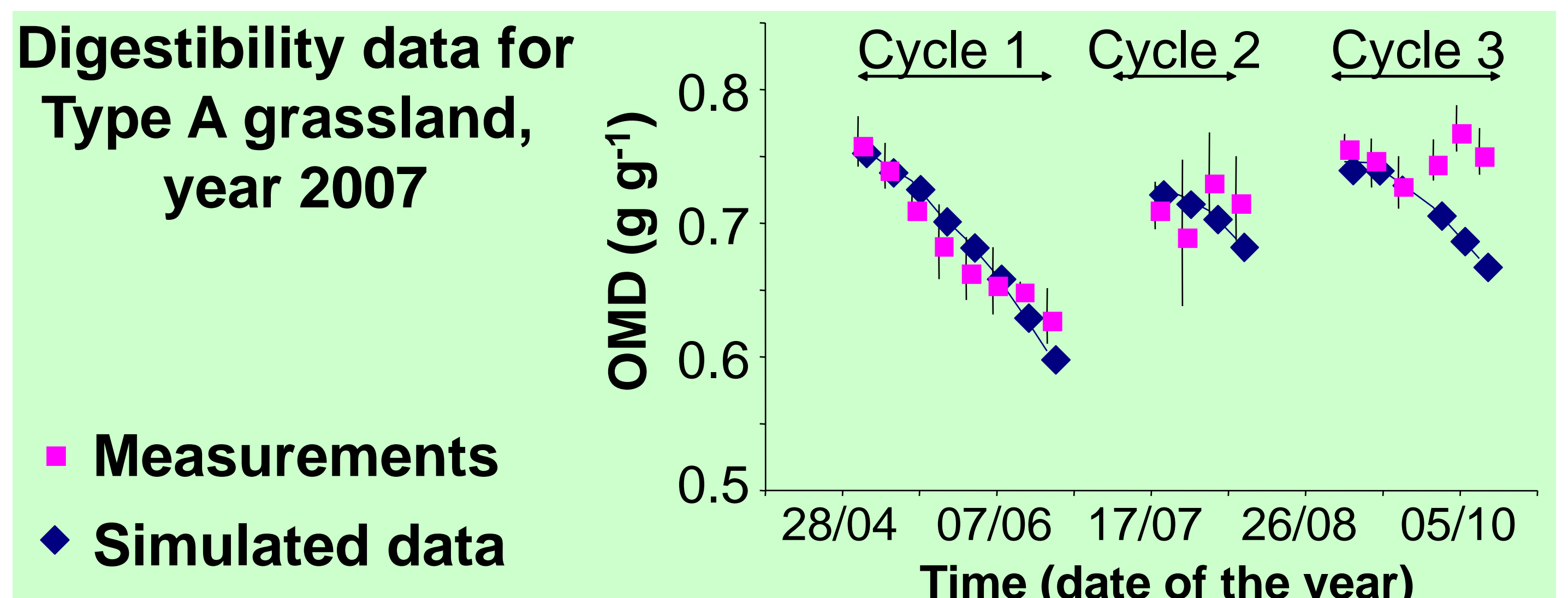
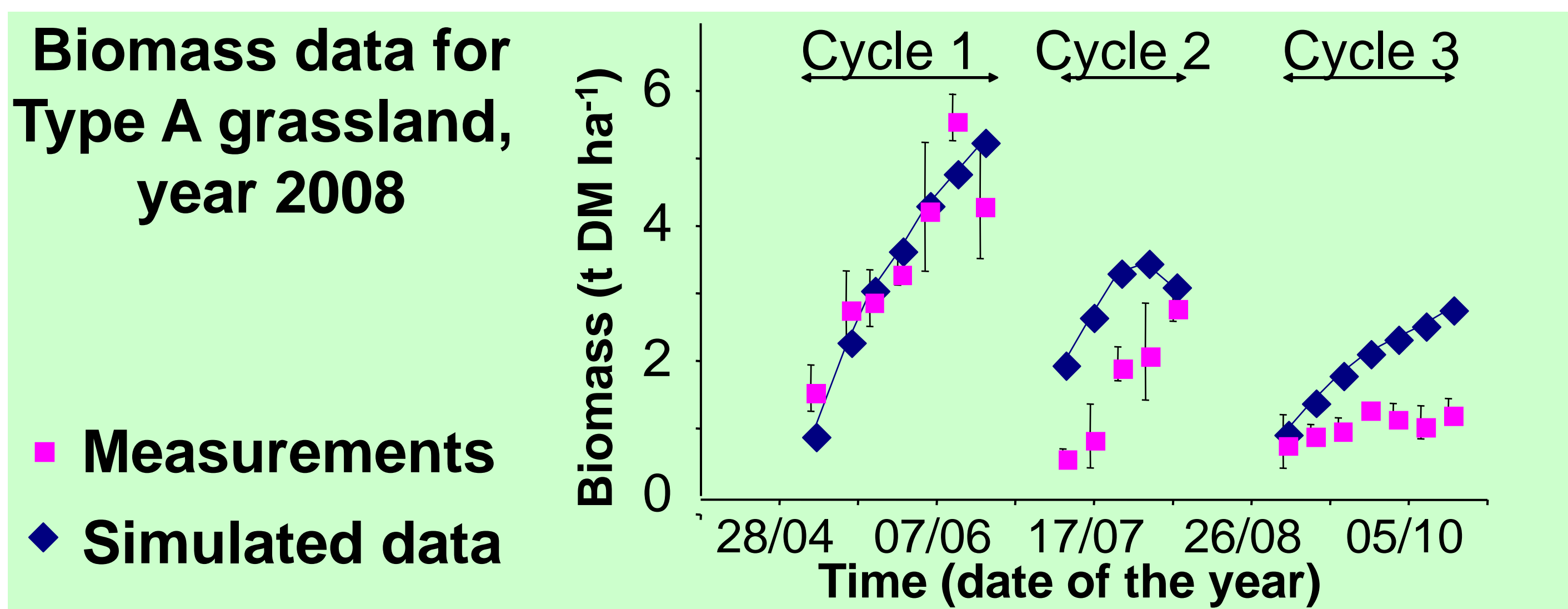
(INRA Marcenat, Cantal)

**Type A grassland** : 86% grasses, dominated by functional group A species (*Lolium Perenne*)

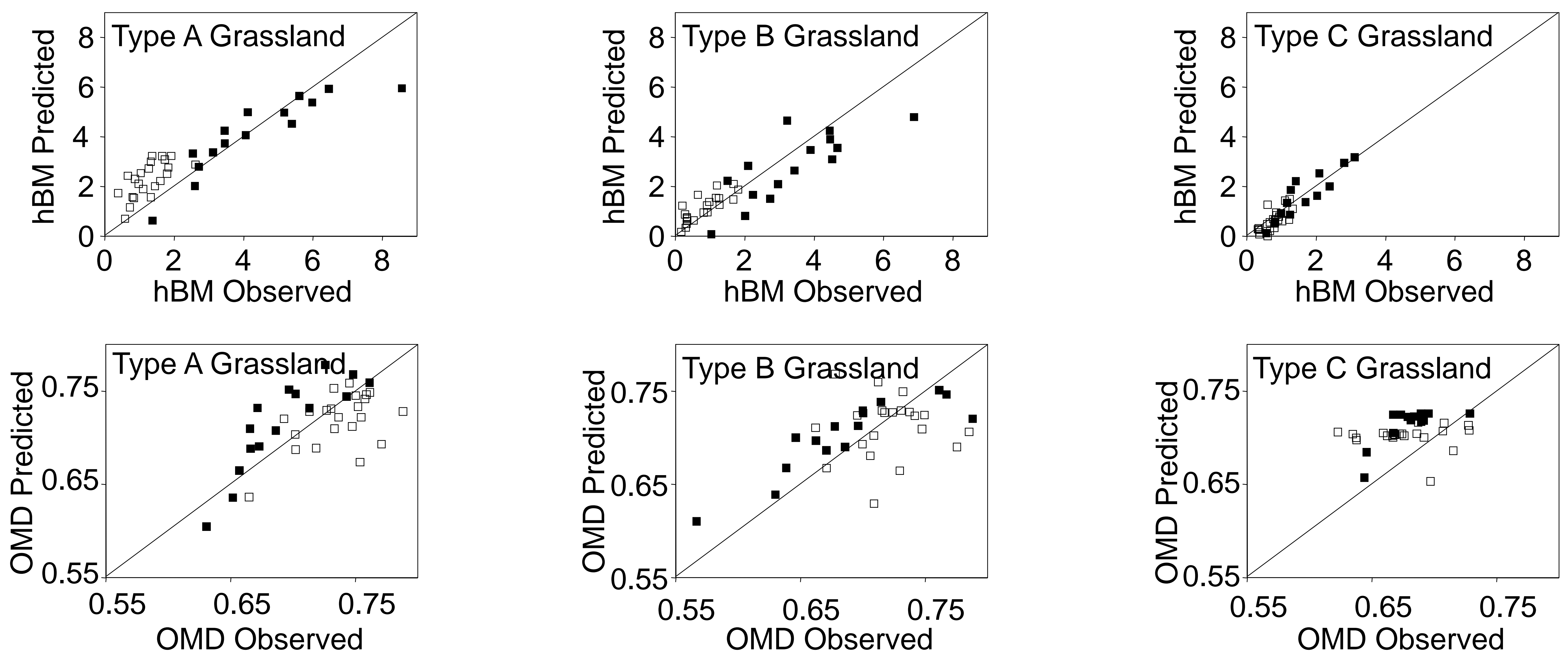
**Type B grassland** : 68% grasses, dominated by group B (*Dactylis glomerata*) and group b species (*Holcus mollis*)

**Type C grassland** : 39% grasses, dominated by group b (*Agrostis capillaris*) and group C species (*Festuca rubra*).

### ➔ Measurements and simulation of biomass and quality over 3 vegetation cycles in 2007 and 2008 for the 3 plots



## RESULTS



**Comparison of observed and simulated harvested biomass (hBM, t DM ha<sup>-1</sup>) and organic matter digestibility (OMD, g g<sup>-1</sup>) for the three types (A, B and C) of grasslands.**

■ : data on the 1<sup>st</sup> growth cycle; □ : data on 2<sup>nd</sup> and 3<sup>rd</sup> growth cycles.

## CONCLUSION

- The model performs better for the 1<sup>st</sup> vegetation cycle than for the following cycles.
- Simulating the dynamics of biomass production better account for the seasonal modulation of growth.
- Simulating digestibility for a wide range of grasslands needs better knowledge on the quality of group b and C species.

