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

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INTRODUCTION and OBJECTIVE

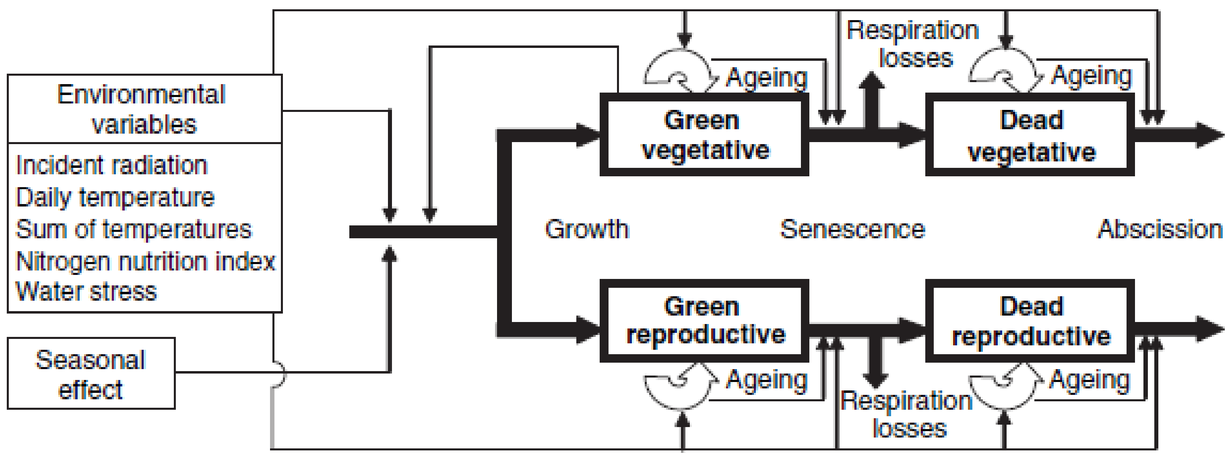
- The classification of grasses into functional groups according to functional traits was proposed to explain among-grassland variability in biomass production and quality (Cruz *et al.,* 2002)
- We developed a model based on this classification to parameterize the type of grassland and predict the dynamics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

Jouven et al., 2006



Three contrasted grassland plots

(INRA Marcenat, Cantal)

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

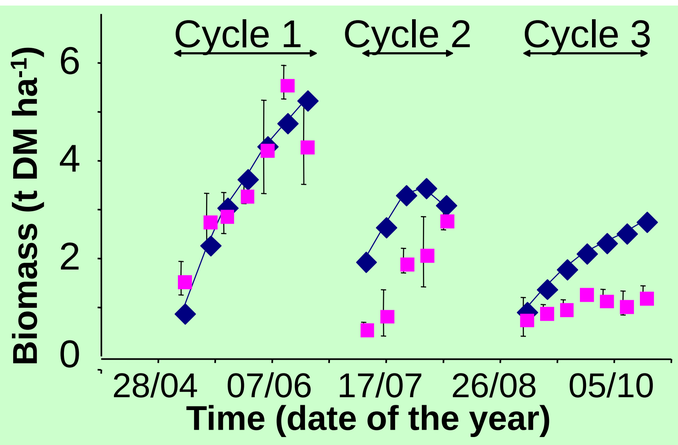
Type B grassland : 68% grasses, dominated by group B (*Dactylis glomerata*) and group b species (*Holcus mollis*)

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

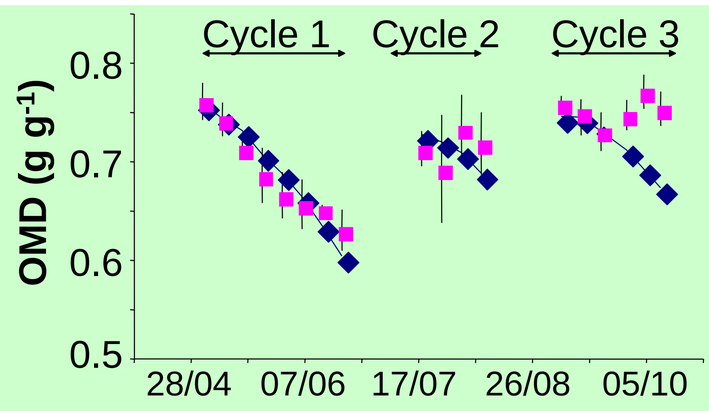
Biomass data for Type A grassland, year 2008

- **Measurements**
- **Simulated data**

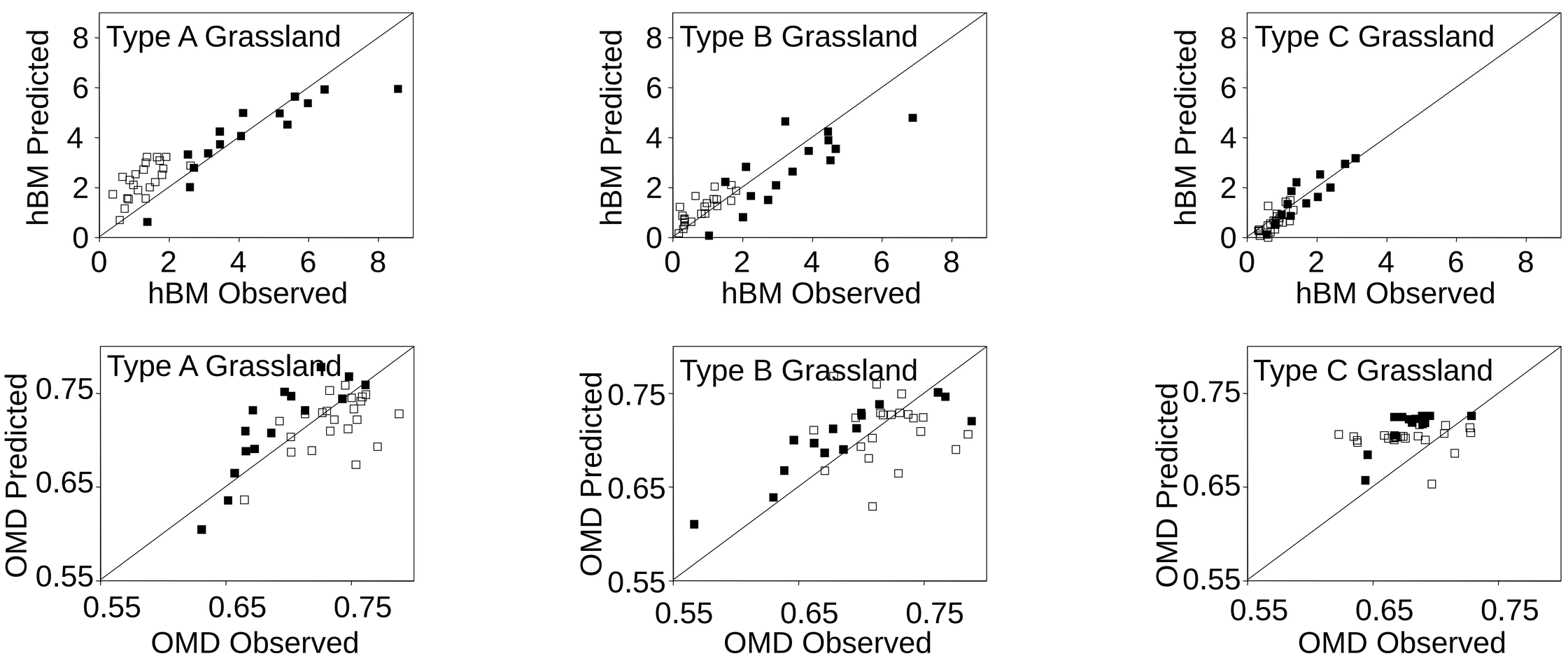


Digestibility data for Type A grassland, year 2007

- **Measurements**
- **Simulated data**



RESULTS



Comparison of observed and simulated harvested biomass (hBM, t DM ha^{-1}) and organic matter digestibility (OMD, g g^{-1}) for the three types (A, B and C) of grasslands.

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

CONCLUSION

- The model performs better for the 1st 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.