

# A simplified method based on the functional composition of the vegetation for characterizing the agricultural services provided by species-rich grasslands



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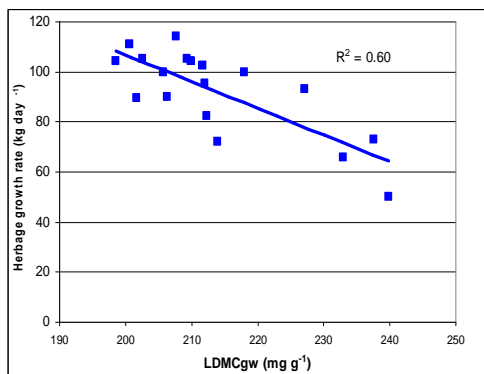
## AIM

- construction of a generic method (grass species-based) for evaluating agronomic services providing by species-rich grasslands: **productivity, temporality of production, flexibility for utilization**
- developpement of a simple method for taking into account dicotyledon species in addition to grass ones

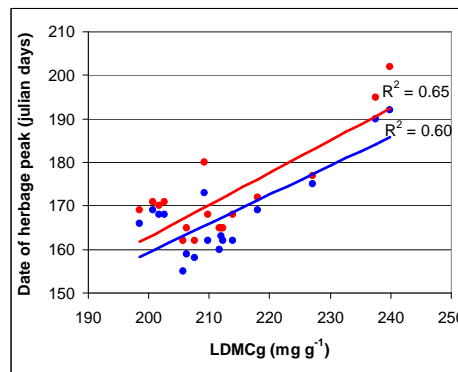
## MATERIAL and METHODS

- grasslands fields in central Pyrenees: 8 plots in 2002 and 18 plots in 2004
- 2 main grass functional types defined on leaf dry matter-based (LDMC) basis (data base)
  - **Acquisitive PFT (low LDMC):** *Holcus lanatus* L., *Lolium perenne* L., *Dactylis glomerata* L., *Festuca arundinacea* (Schreb.), *Poa trivialis* L.; companion dicots species: *Chaerophyllum aureum* L., *Ranunculus acris* L., .....
  - **Conservative PFT (high LDMC):** e.g. *Agrostis capillaris* L., *Festuca rubra* L., *Phleum pratense* L., *Trisetum flavescens* L. (P. Beauv.); companion dicots species (*Centaurea* sp., *Leotodon hispidus* L., *Plantago lanceolata* L).
- there were 5 of the 8 plant communities in 2002 and 15 of the 18 in 2004 that were dominated by acquisitive PFT.
- LDMC was weighted by species abundance (LDMCgw)
- temporality of production was assessed by the date at which herbage peak occurred (Julian days)
- flexibility of herbage used was assessed by an index of plant trait diversity (FD)

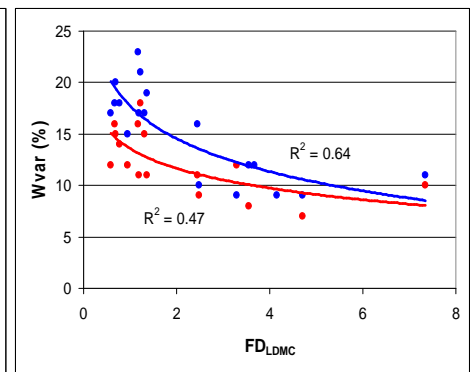
### PRODUCTIVITY



### TEMPORALITY



### FLEXIBILITY



LDMCgw: leaf dry matter content weighted by the grass species abundance

- Grass species
- whole species

Percentage of herbage mass 20 days before the peak in relation to peak mass (Wvar) according to the functional diversity index

## CONCLUSION

- The three agronomic services (productivity, temporality, flexibility), and quality (Duru et al 2010) considered can be appropriately assessed considering the abundance of the grass species for which LDMC is known, and the percentage of dicots species as a whole.
- This allows to assess agronomic services provided by permanent grasslands because relationships between LDMC and main plant features (e.g. flowering time, leaf lifespan) that have an effect upon agronomic properties are genetically fixed and are little dependant of environmental factors.