

# Influence of different management treatments on functional diversity in the semi-natural grassland communities

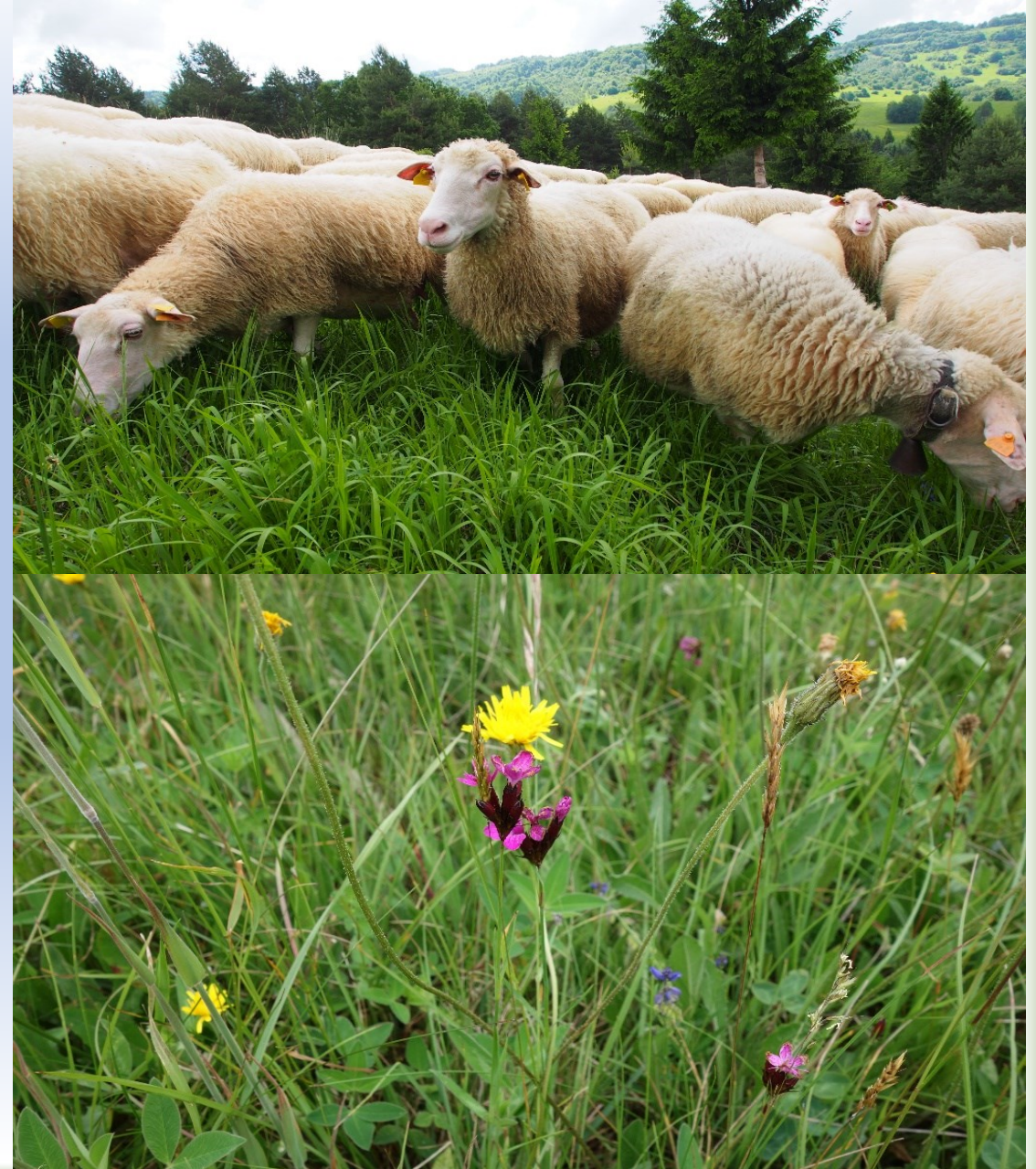


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# Aims of study

- To compare the structure of functional traits across the management regimes during the 7 years of experiment
- How the different management treatments affect the representation of functional traits and how they it changes across the time line?
- How the soil nutrient content is affected by different management treatments?





# Methods





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- Permanent plots in the Poľana Mts. (since 2009)





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# Methods

- Treatments

Grazing

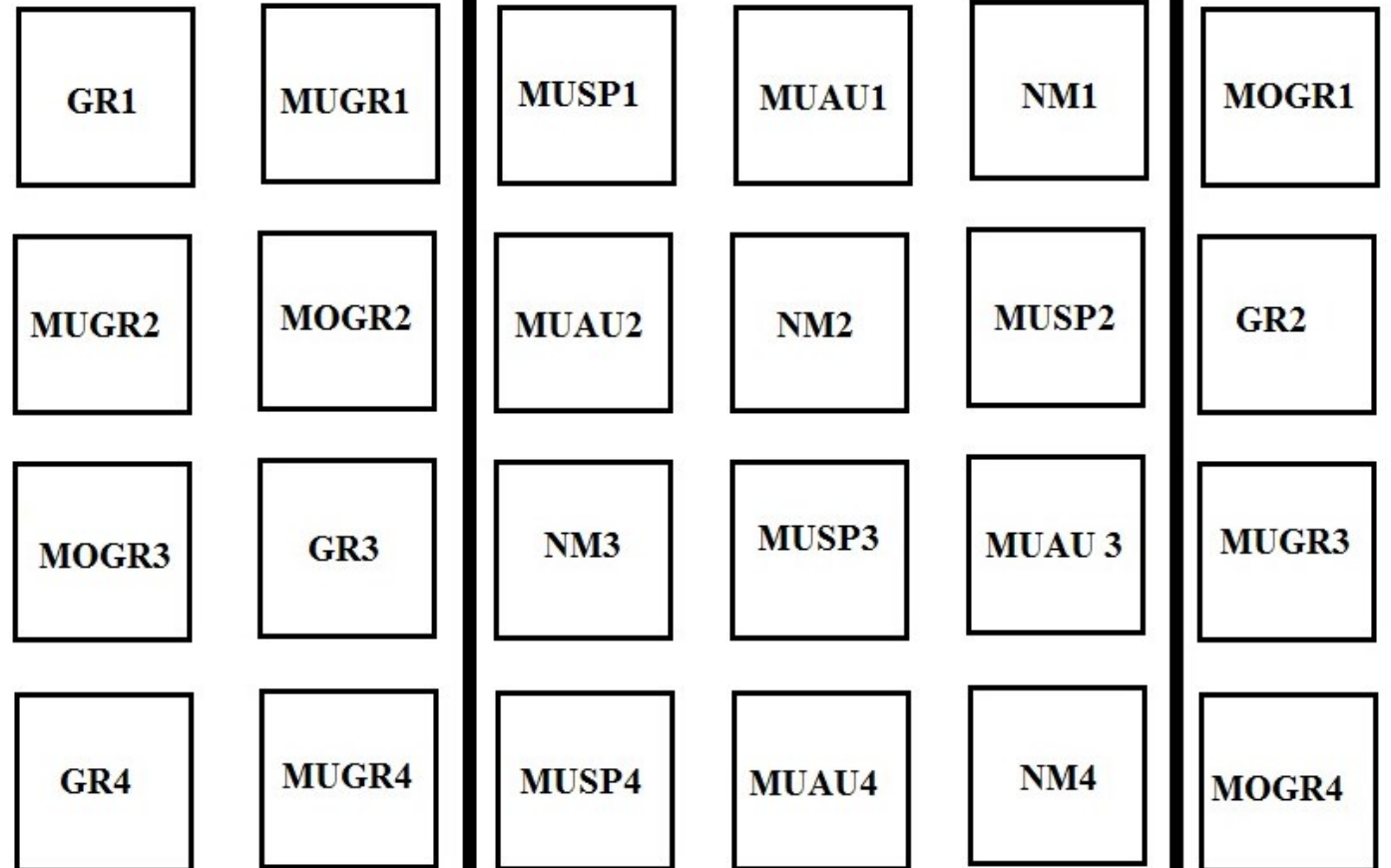
Grazing + mulching in autumn

Grazing + mowing in autumn

Mulching in spring

Mulching in autumn

Unmanaged plots





# Methods

- Treatments
  - Grazing
  - Grazing + mulching in autumn
  - Grazing + mowing in autumn
  - Mulching in spring
  - Mulching in autumn
  - Unmanaged plots
- Matts grassland communities of the *Violion caninae* alliance
- Extensively grazed by cattle and sheep June - September





# Methods

- Treatments
  - Grazing
  - Grazing + mulching in autumn
  - Grazing + mowing in autumn
  - Mulching in spring
  - Mulching in autumn
  - Unmanaged plots
- Sampling
  - Plot size: 2x2 m
  - Species frequency data
  - 16 plots / 10x10 cm
- Soil sample
  - 200 g / plot
  - Soil P, N, humus, C:N ratio
- Matts grassland communities of the *Violion caninae* alliance
- Extensively grazed by cattle and sheep June - September

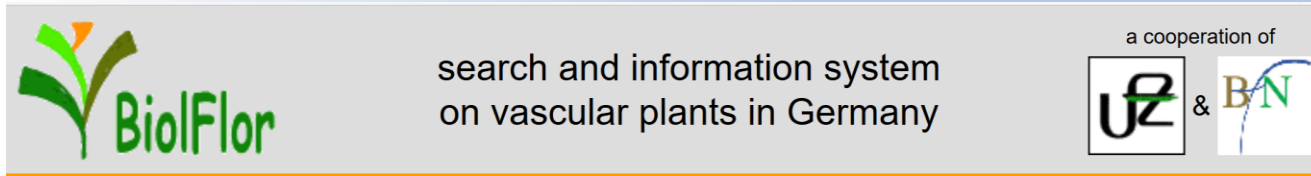




# Methods



- Studied traits:  
Canopy height, SLA, LDMC, Leaf distribution, Raunkier life form, Growth forms, Grime strategies, Plant life span, Type of reproduction, Lateral spread, Storage organ, Age of flowering, Seed Bank, Seed mass



search and information system  
on vascular plants in Germany

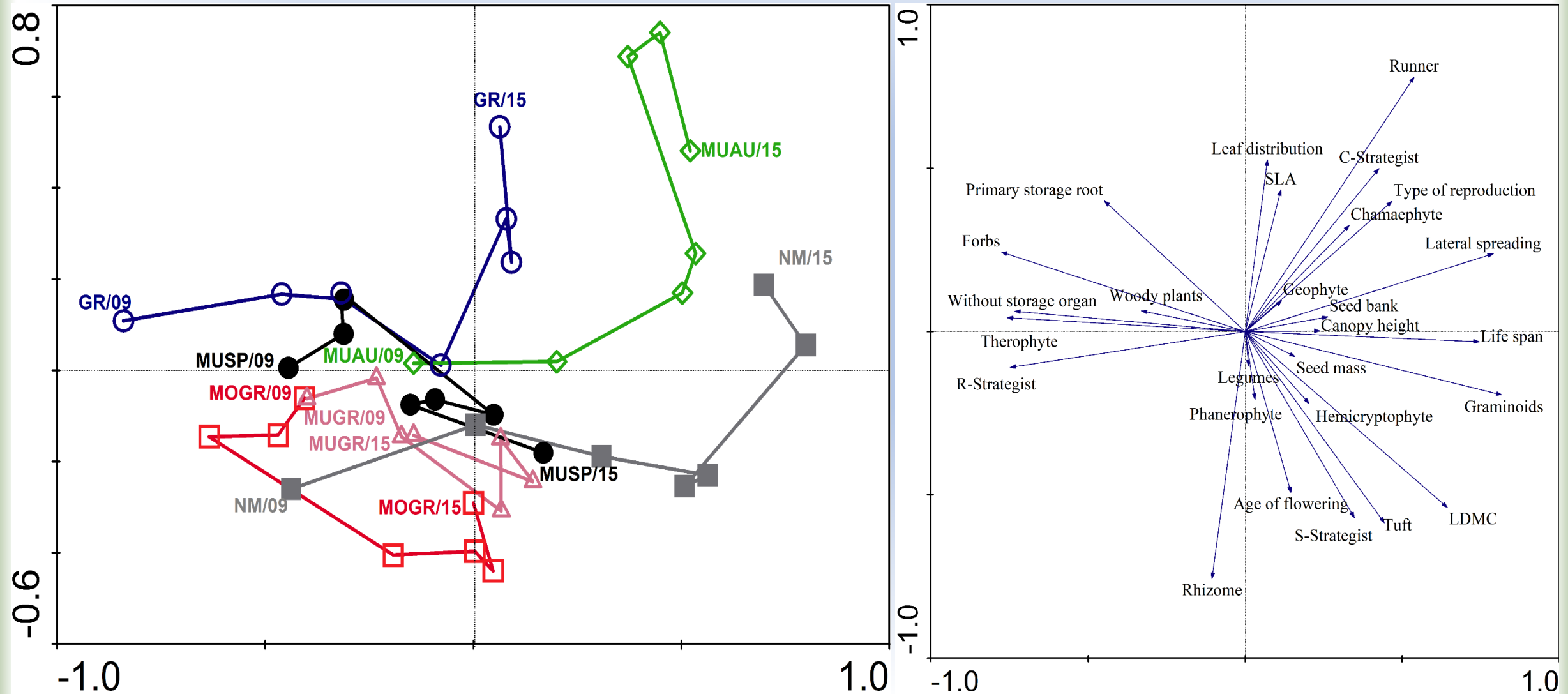


- CWM  
The average of standardized trait values in community weighted by the frequency of the species
- Data analyses
  - PCA
    - Temporal changes in functional composition
  - Repeated measurements ANOVA
    - Effect of particular treatments in time on the functional traits
  - The one-way ANOVA
    - evaluation of soil components



# Results

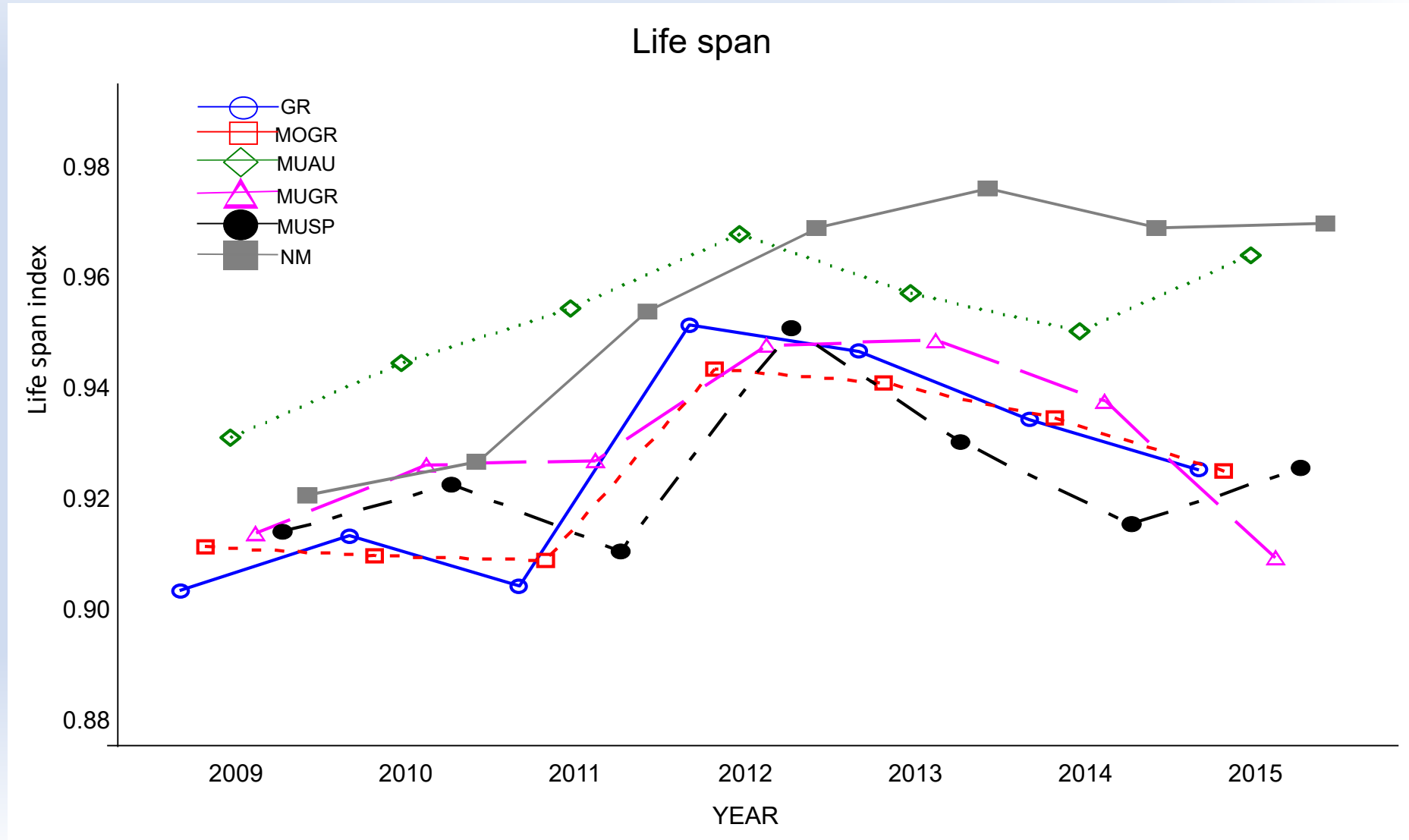
## PCA – Relation and changes in functional traits accros management regimes during 2009 – 2015





# Results

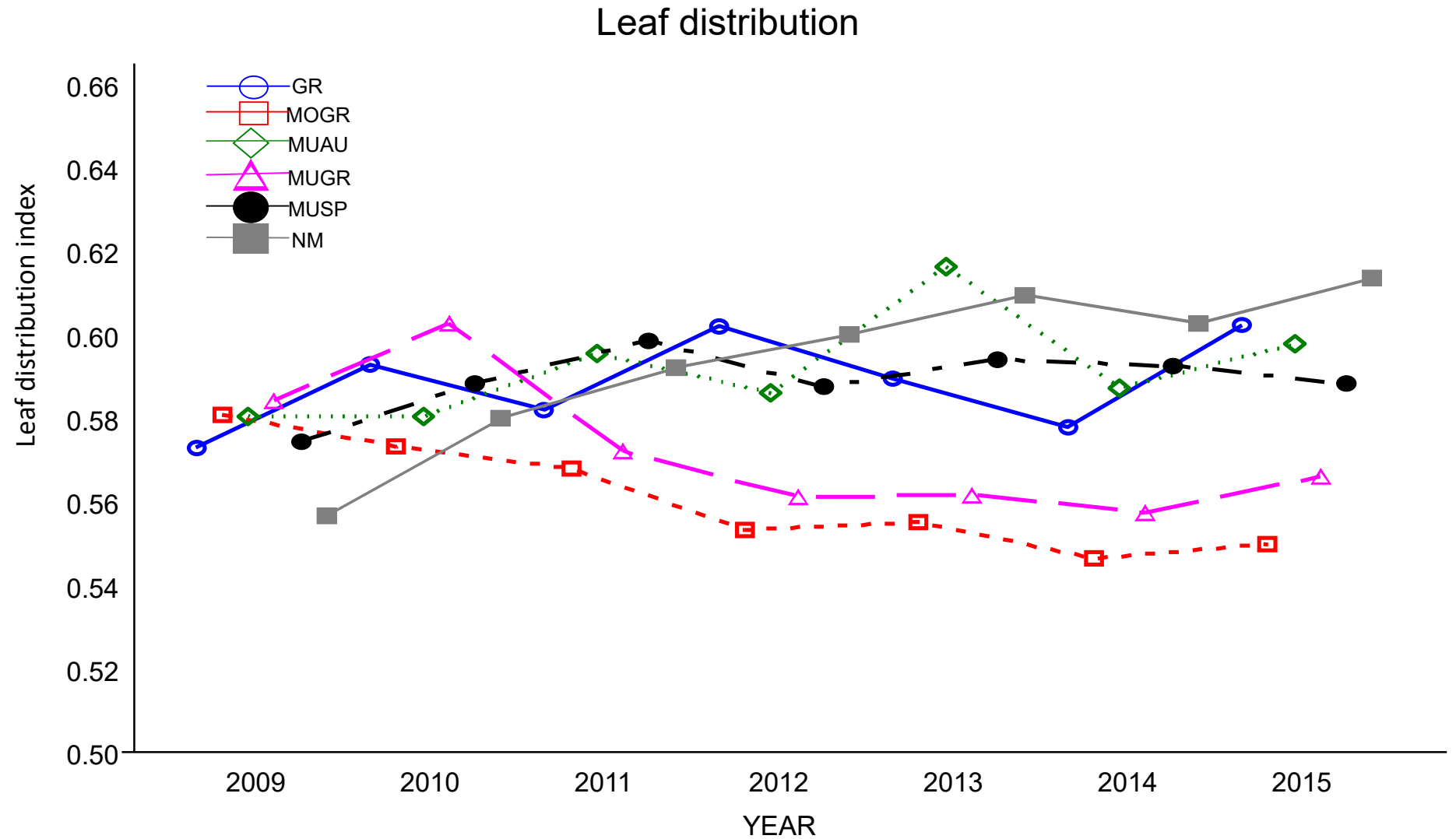
- Life span ( $p = 0,015$ )





# Results

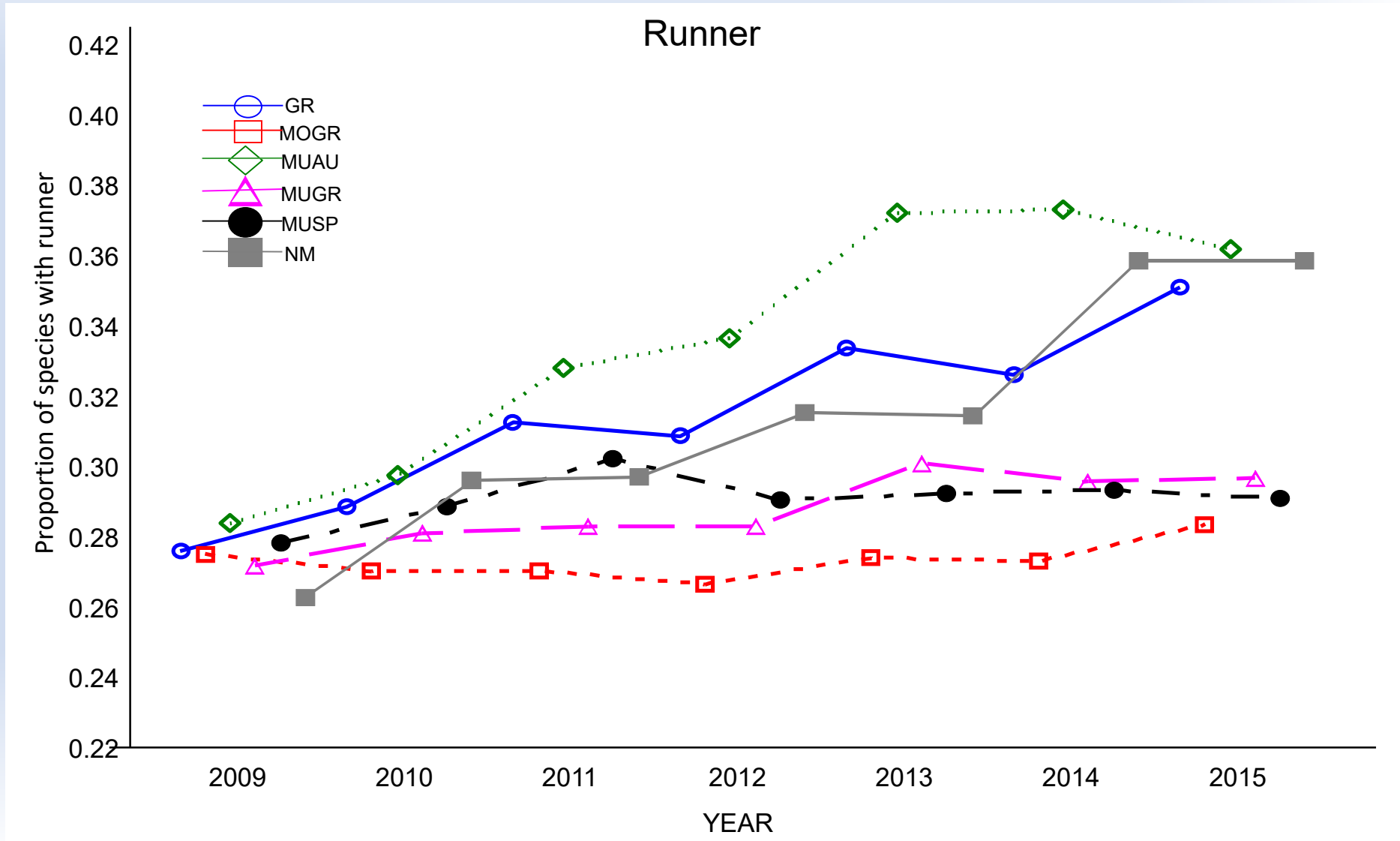
- Leaf distribution ( $p = 0,043$ )





# Results

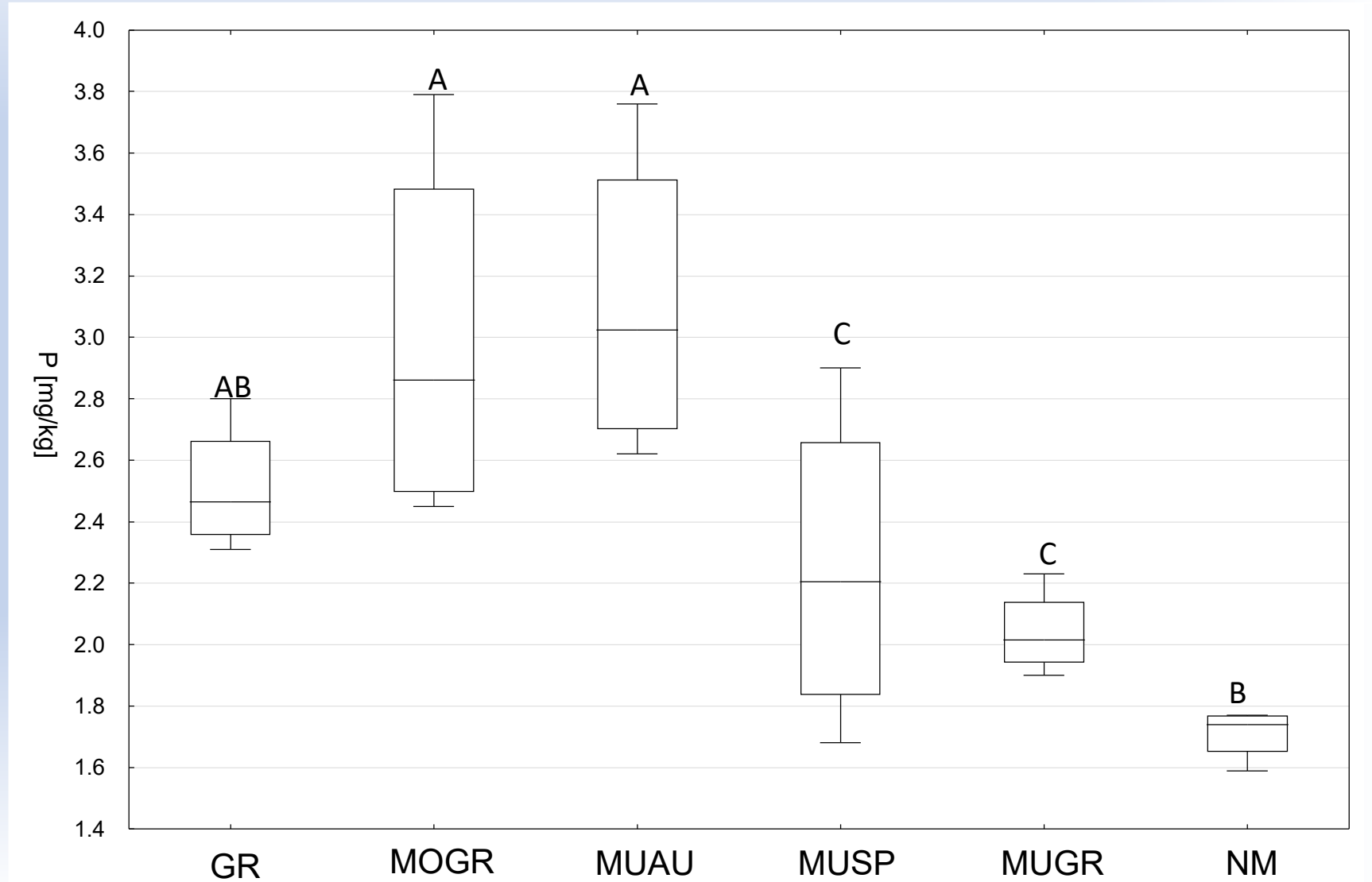
- Runner ( $p = 0,020$ )





# Results

- Phosphorous ( $p = 0,0008$ )





# Conclusion

- Autumn mulching – just for short time (1 – 2 year)
- Mulching – temporal solution to prevent spreading of shrubs and trees
- Negative trend of mulching
- Mulching is acceptable only in combination with grazing
- Decreasing trend of grazing intensity – combination with mowing/mulching
- Key factor: term of mulching

