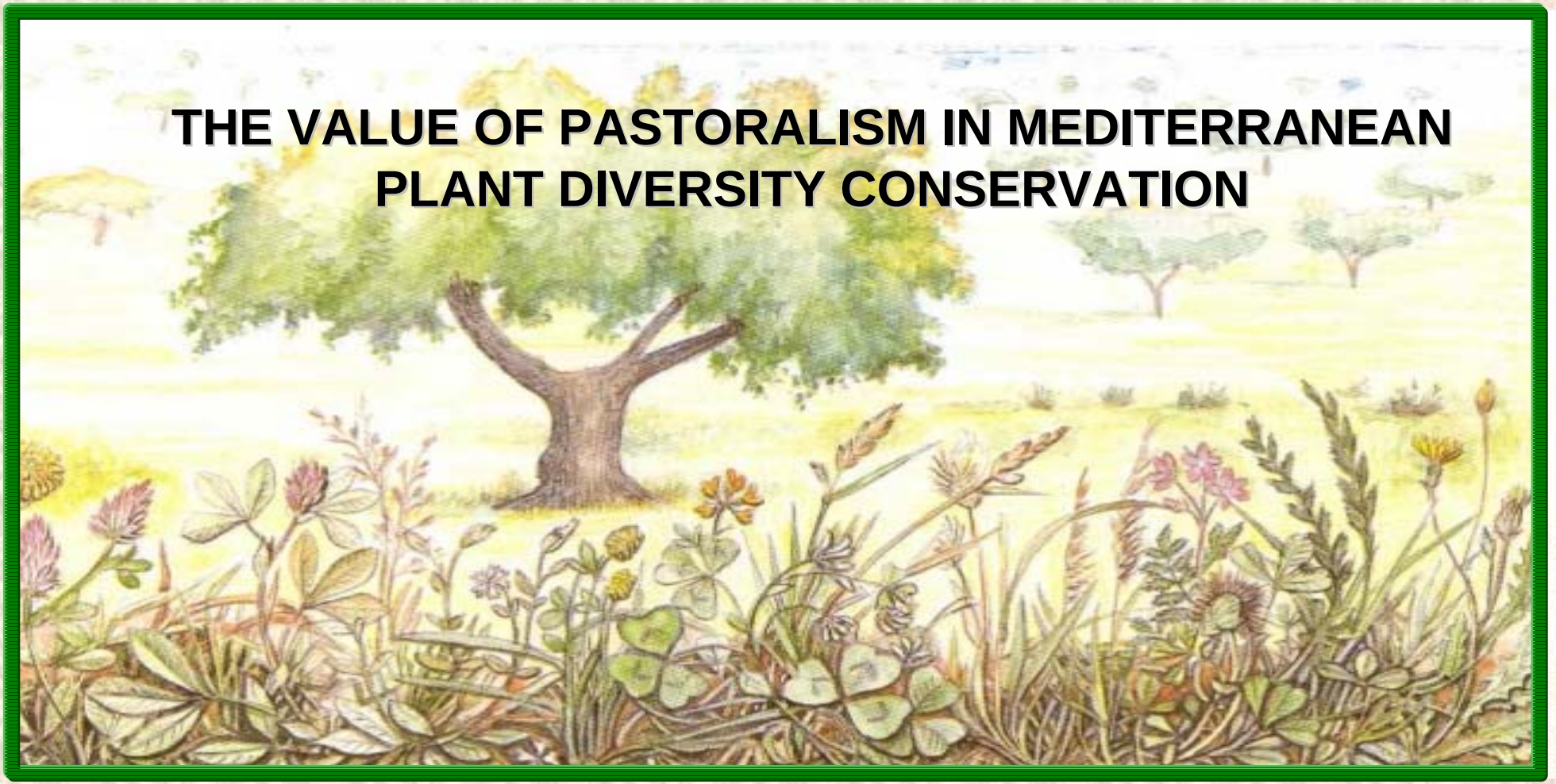
THE VALUE OF PASTORALISM IN MEDITERRANEAN PLANT DIVERSITY CONSERVATION



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Departamento de Ecología
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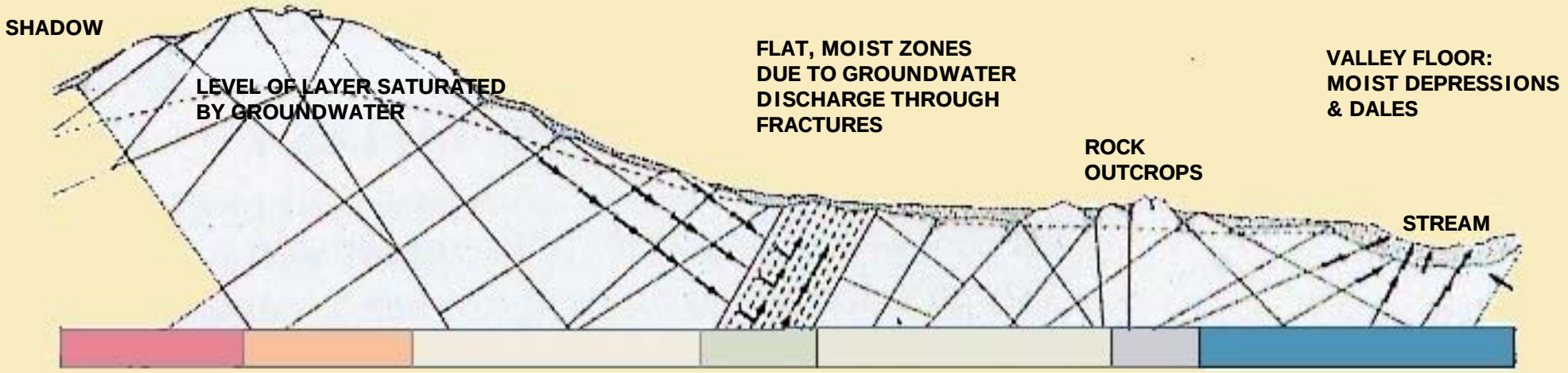
FACTORS RELATED TO SPECIES RICHNESS

- Spatial gradients linked to topography & presence of trees
- Inter-annual rainfall variations = > availability of water and nutrients
- Grassland management activities (ploughing)
- The role of Herbivores: disturbance (defoliation, trampling, grubbing, dung), nutrient availability (dung) and seed dispersal

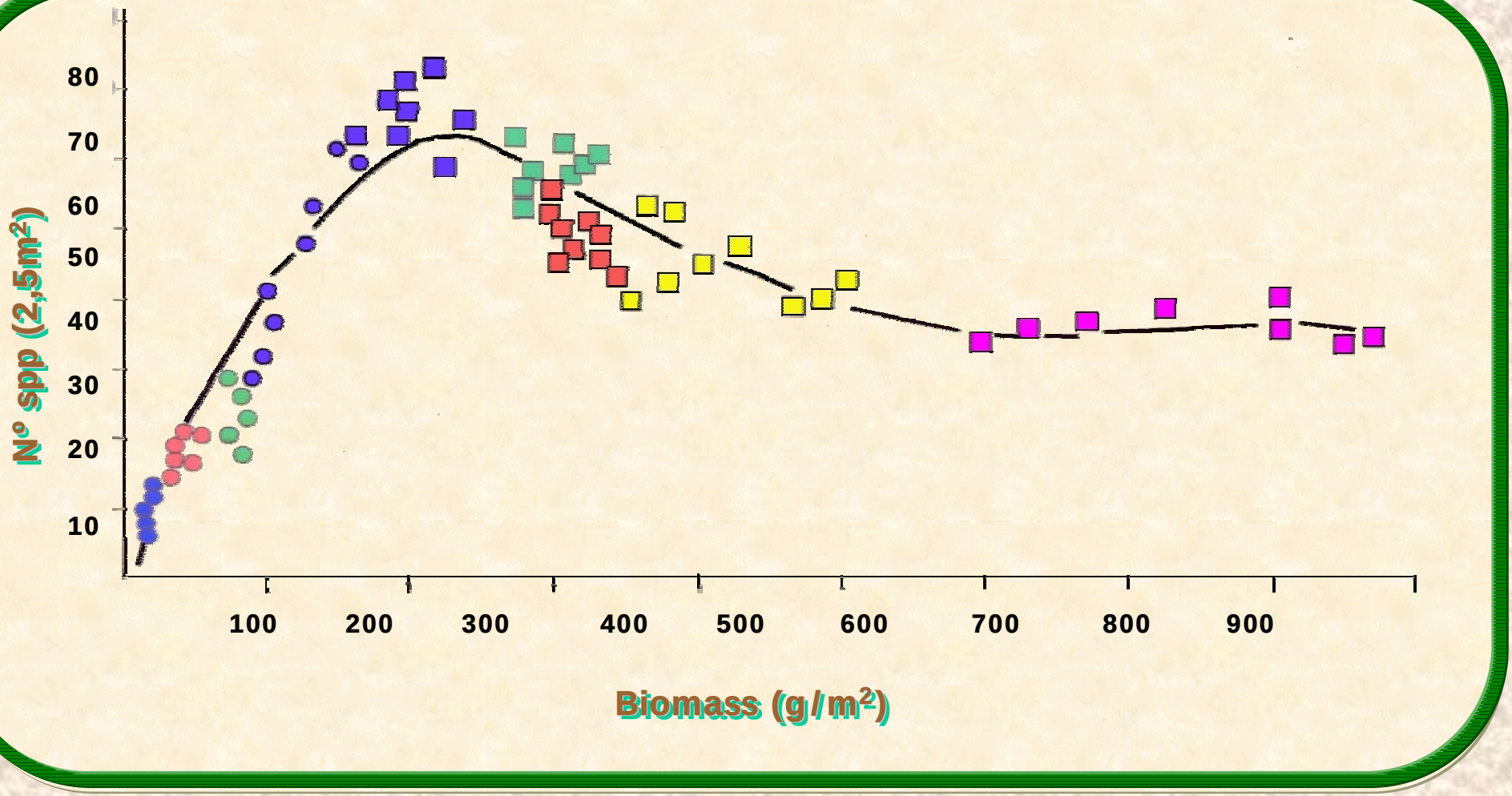
SPATIAL STRUCTURE

SLOPES WITH SHALLOW SOILS

FLAT ZONES WITH RELATIVELY DEEP SOILS

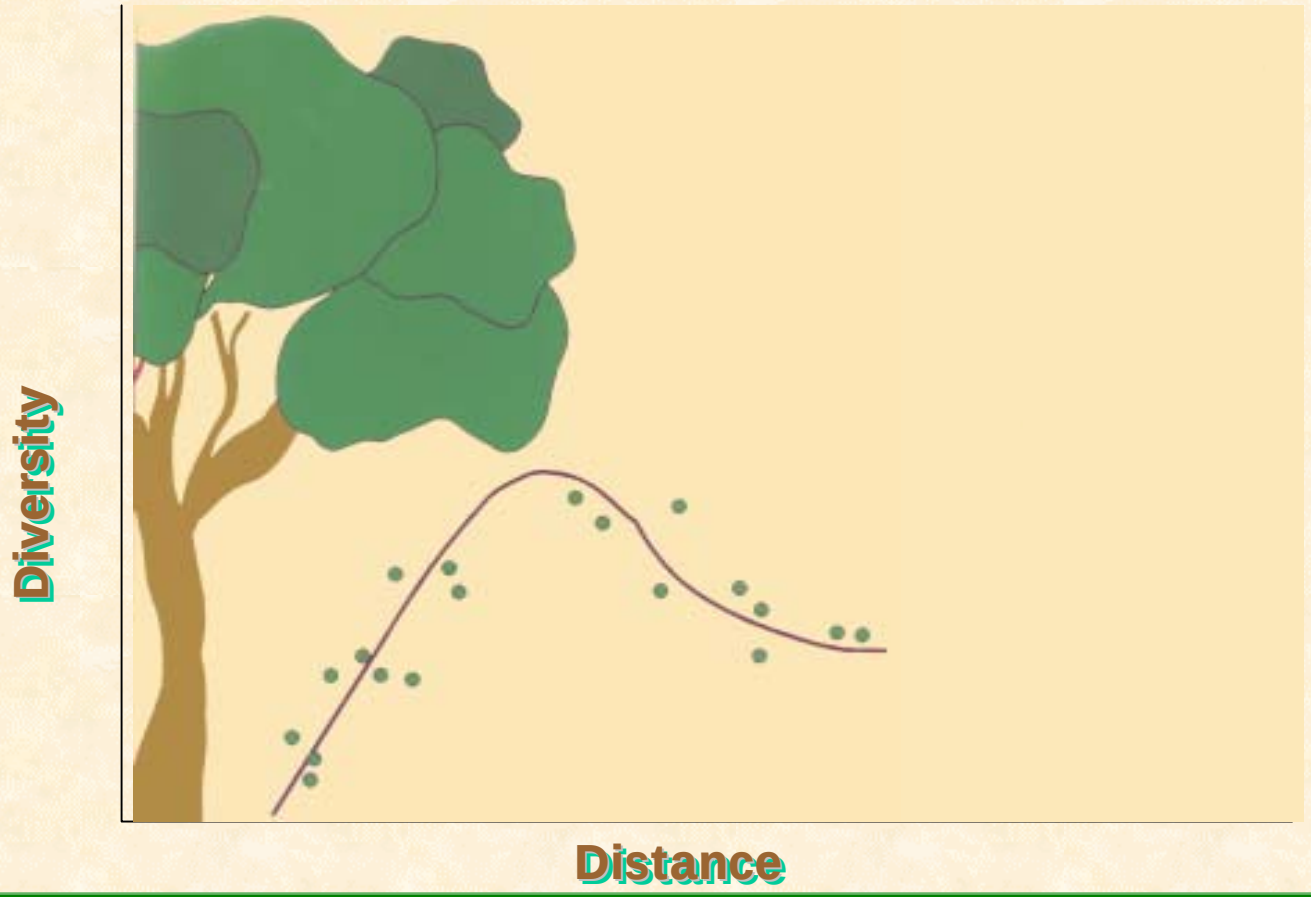


Bernáldez & Peco (1991)



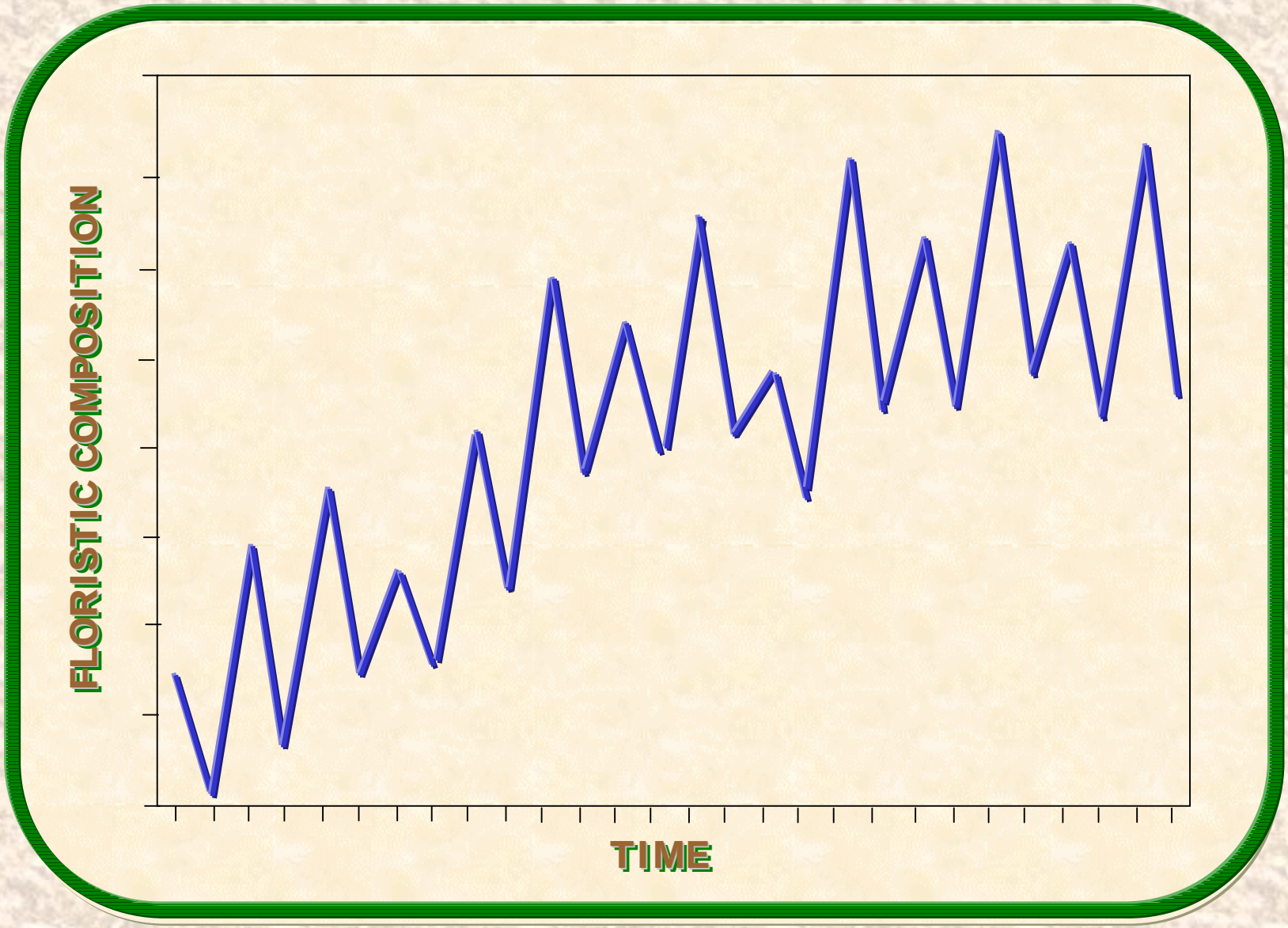
Puerto et al., 1990. J.Veg.Sci.

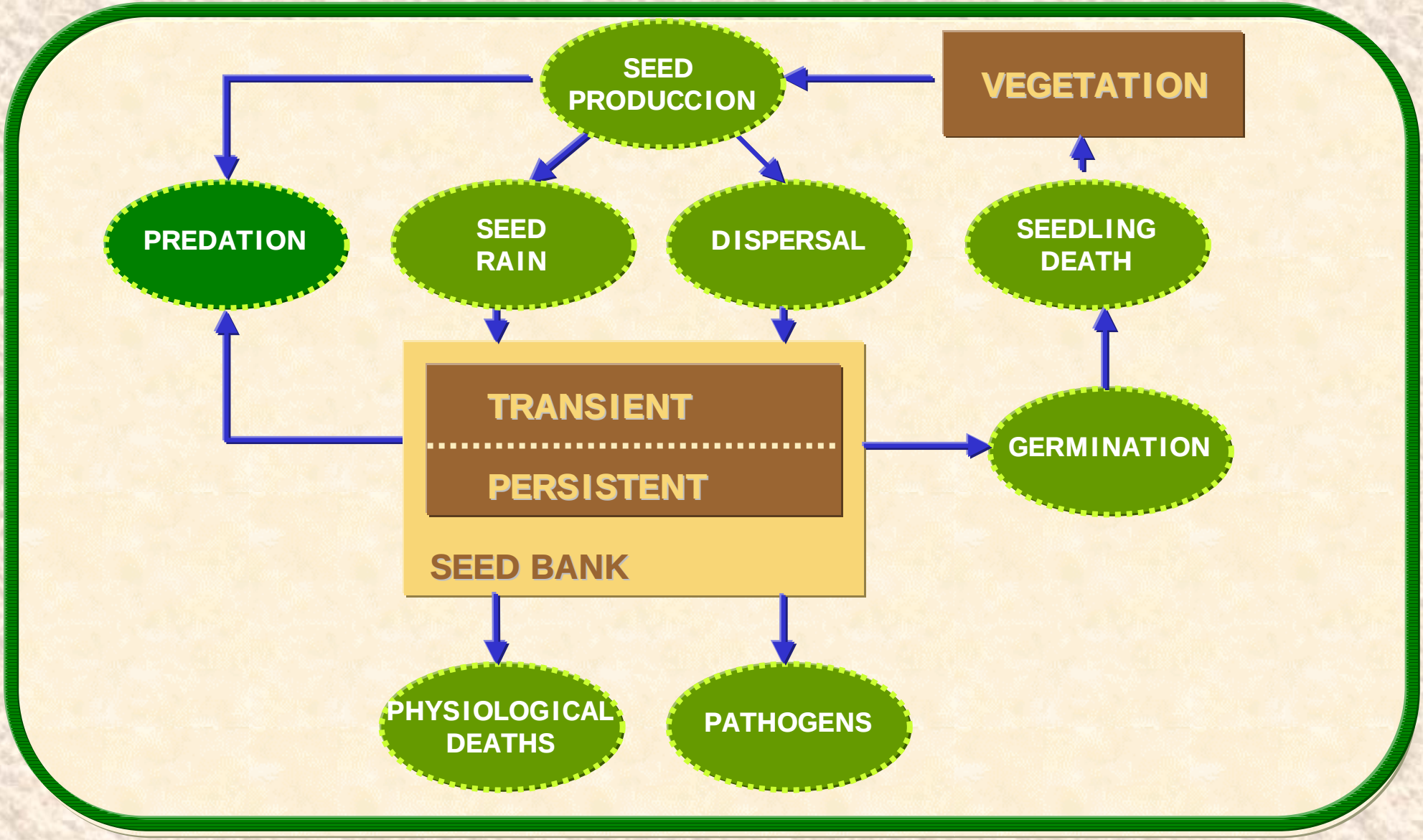
EFFECT OF TREES



Bernáldez et al, (1969) Bol. Soc. Esp. Hist. Nat., 67

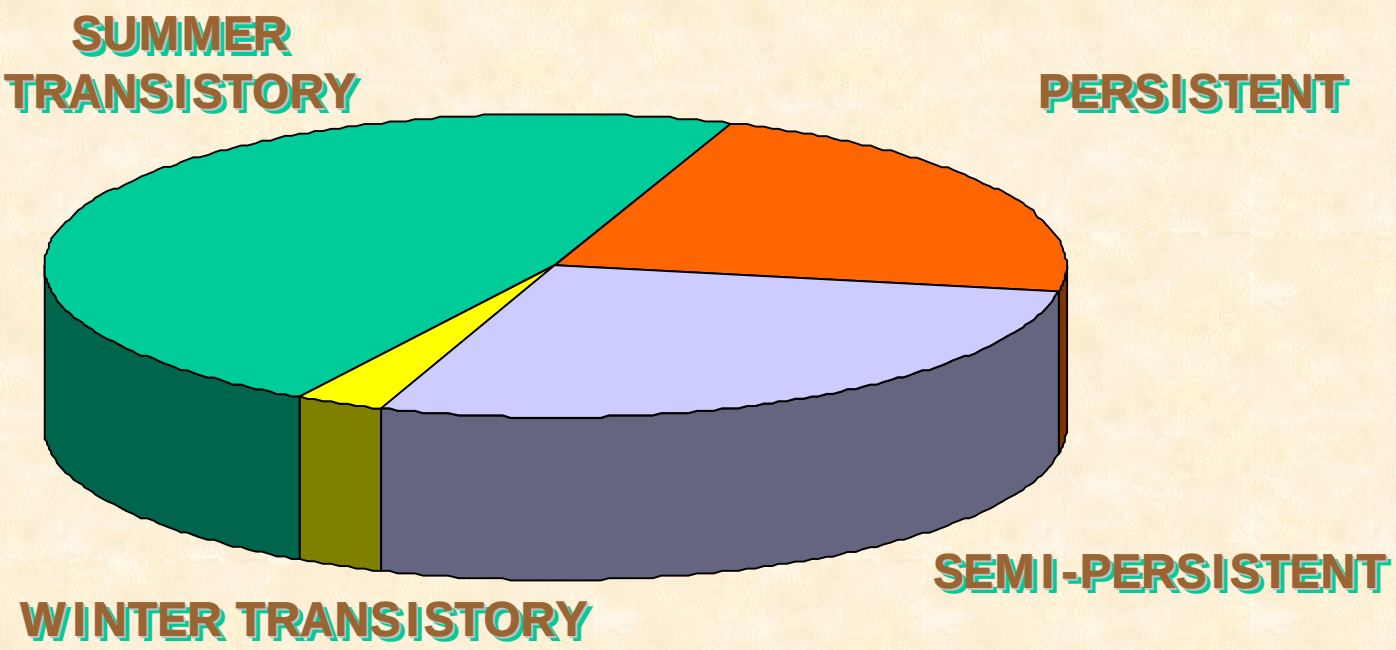
GRASSLAND DYNAMICS





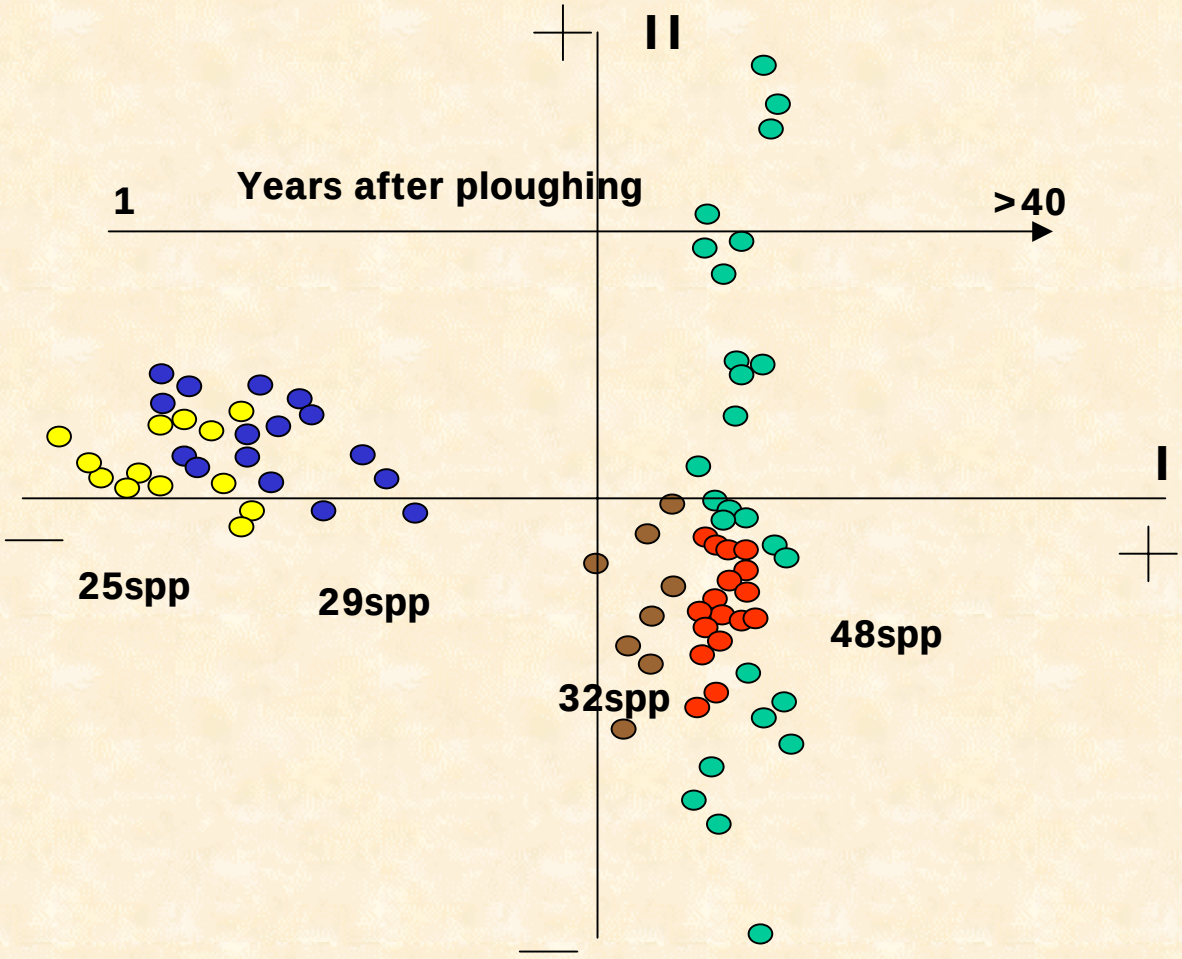
Thompson & Grime (1979) J. Ecol, 67

TYPES OF SEED BANKS IN MEDITERRANEAN GRASSLANDS



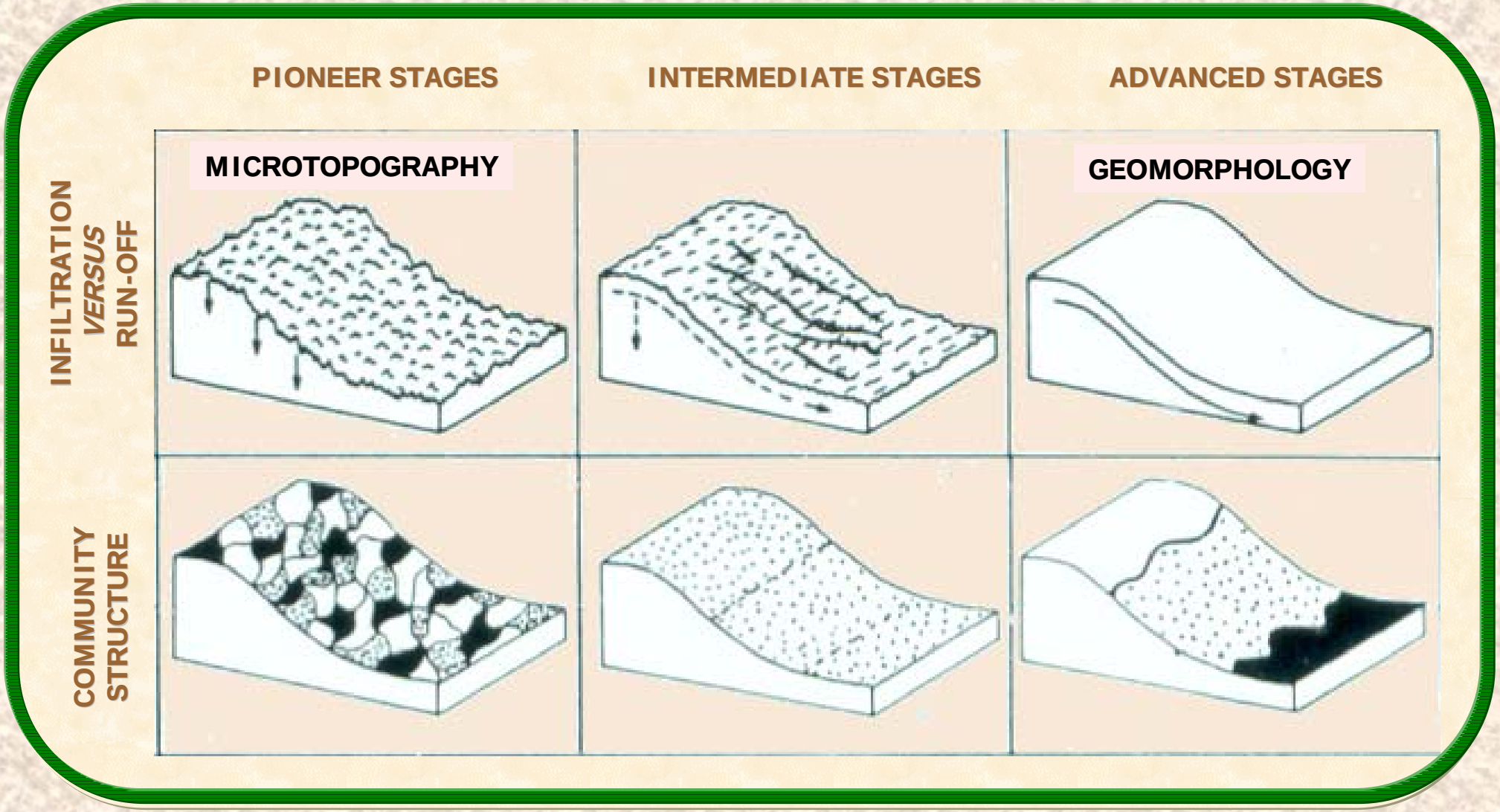
SUCCESION AFTER PLOUGHING

FLORISTIC COMPOSITION AND SUCCESSION



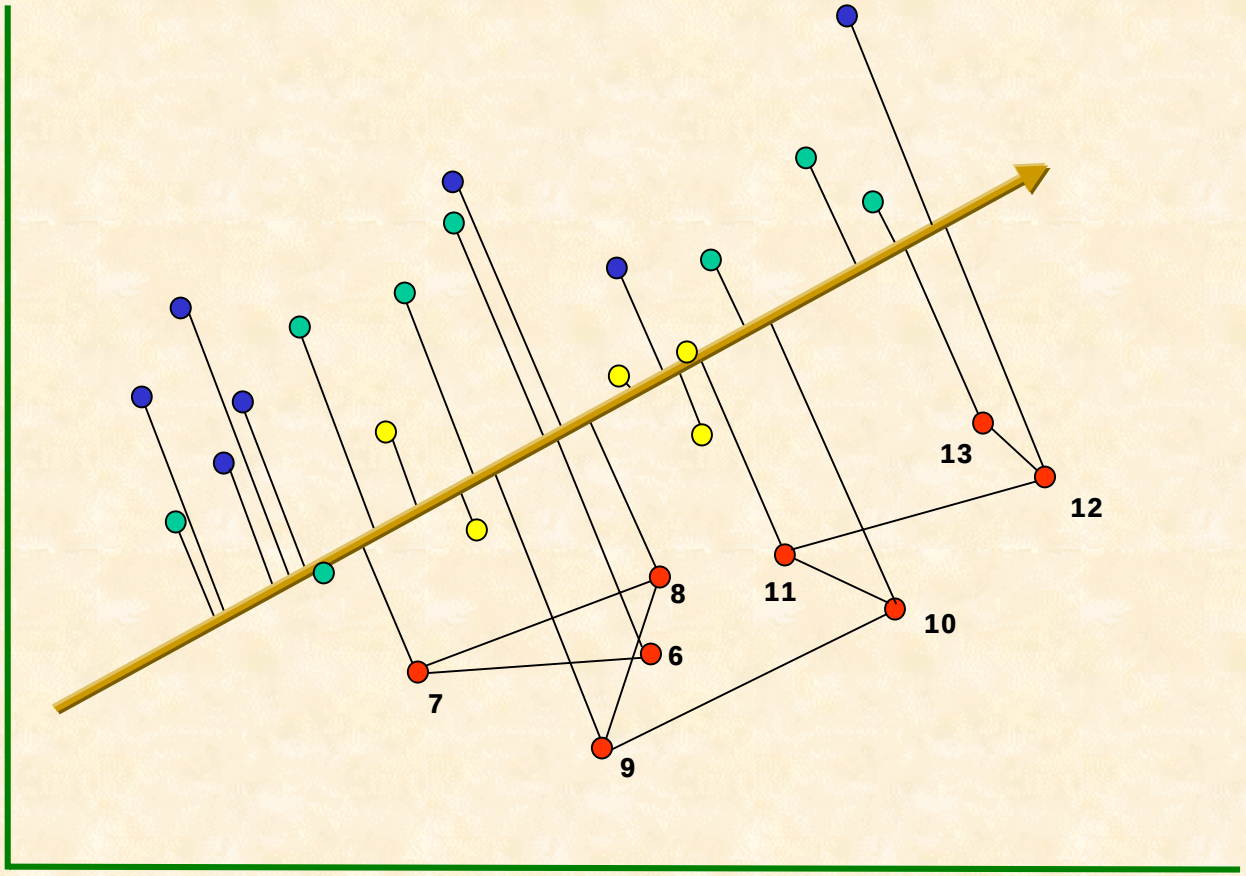
Pineda, F. D., et al. (1981)
Vegetatio 44, 165-176

COMMUNITY STRUCTURE AND SUCCESION



COMMUNITY DYNAMICS

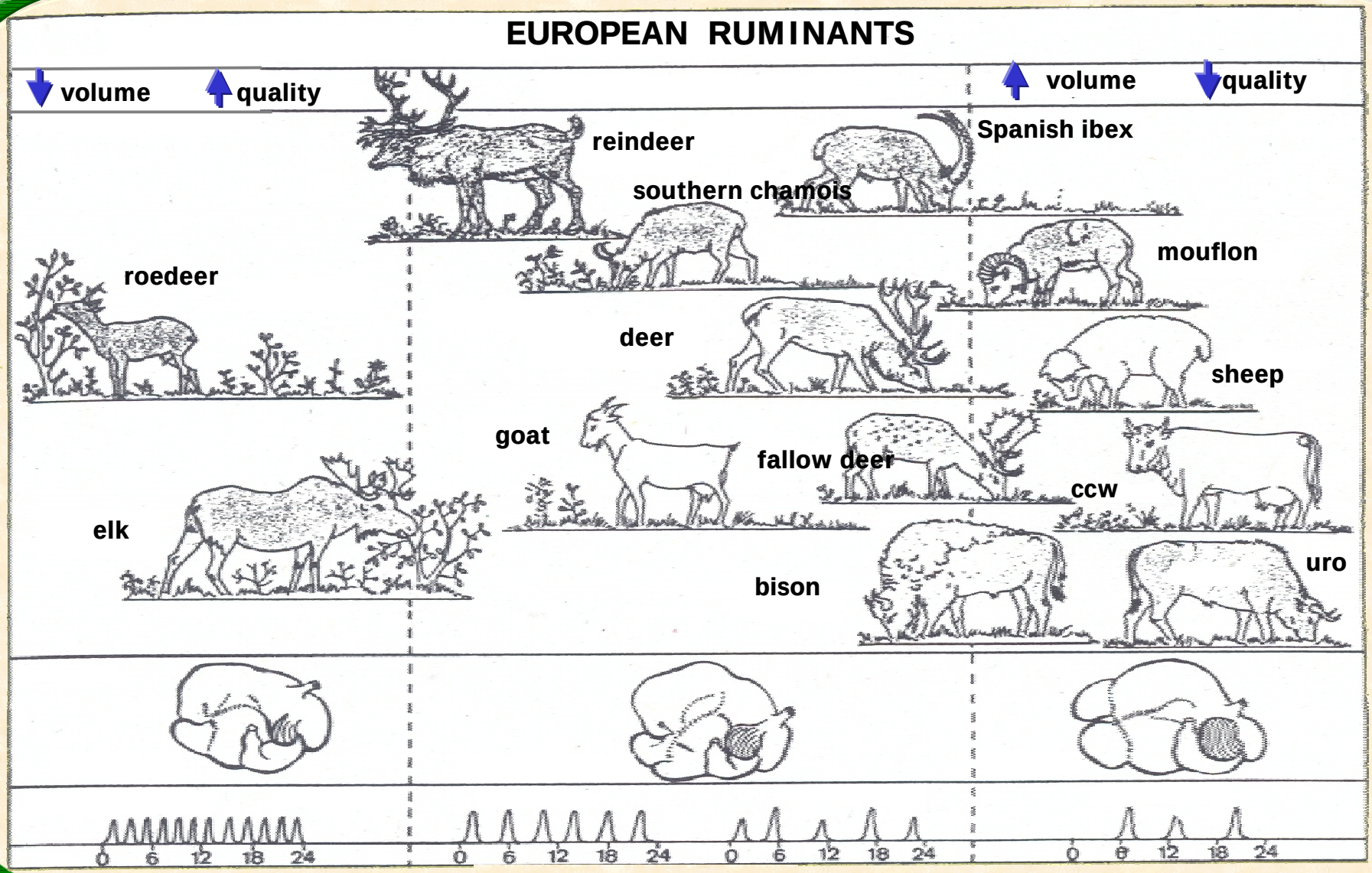
$$D = a_0 + a_1 \text{ SITE} + a_2 \text{ YEAR} + a_3 \text{ SITExYEAR} + a_4 \text{ AUTUMN RAIN} + a_5 \text{ TOTAL RAIN}$$



Peco, B. 1989, Vegetatio, 83: 269-276

ROLE OF LARGE HERBIVORES

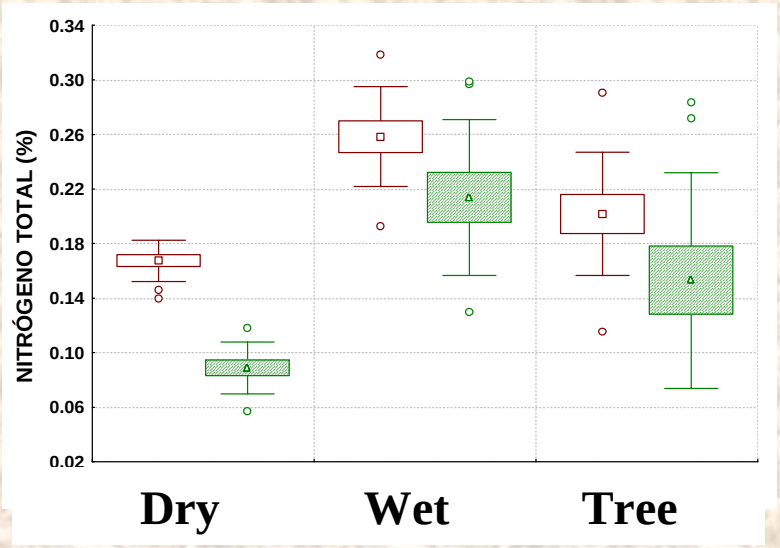
TYPE OF HERVIBORE



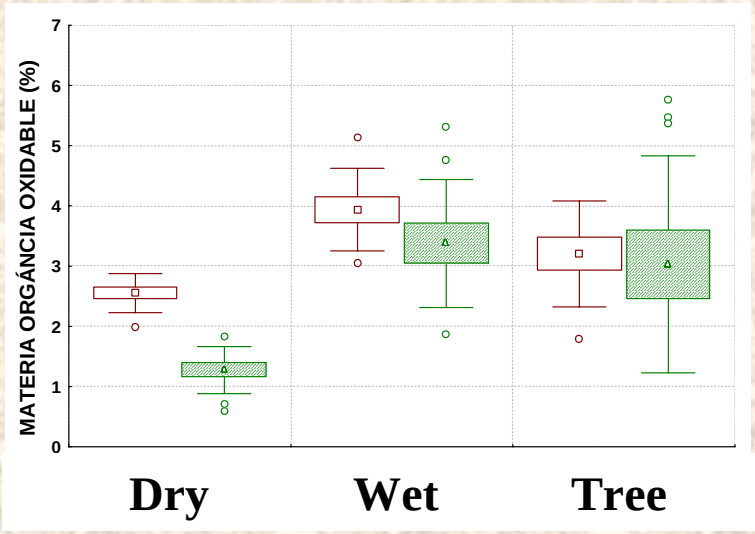
Hoffman (1989) Oecología 78

EFFECT OF GRAZING ON SOILS

Nitrogen



Organic matter

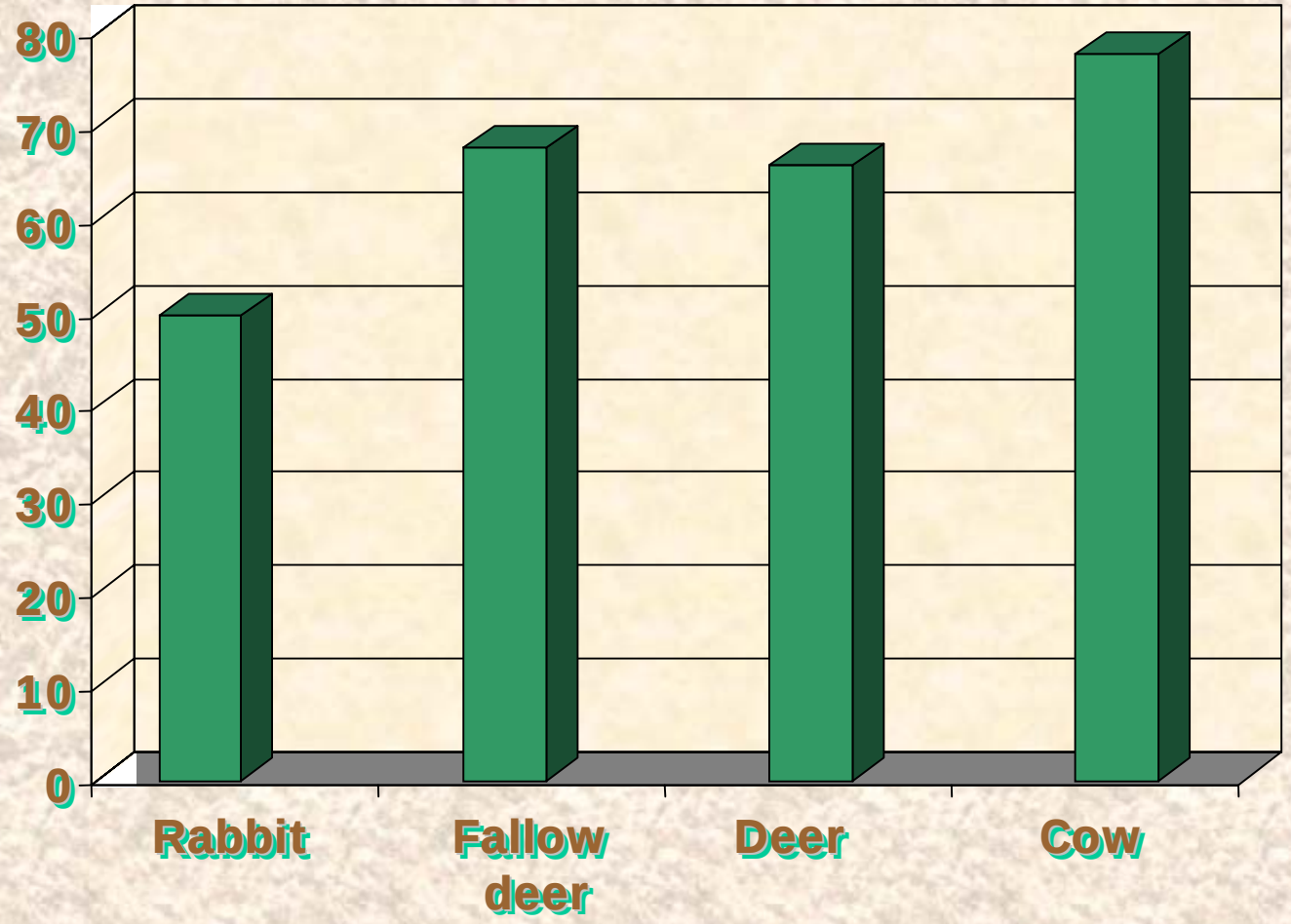


GRAZED

UNGRAZED

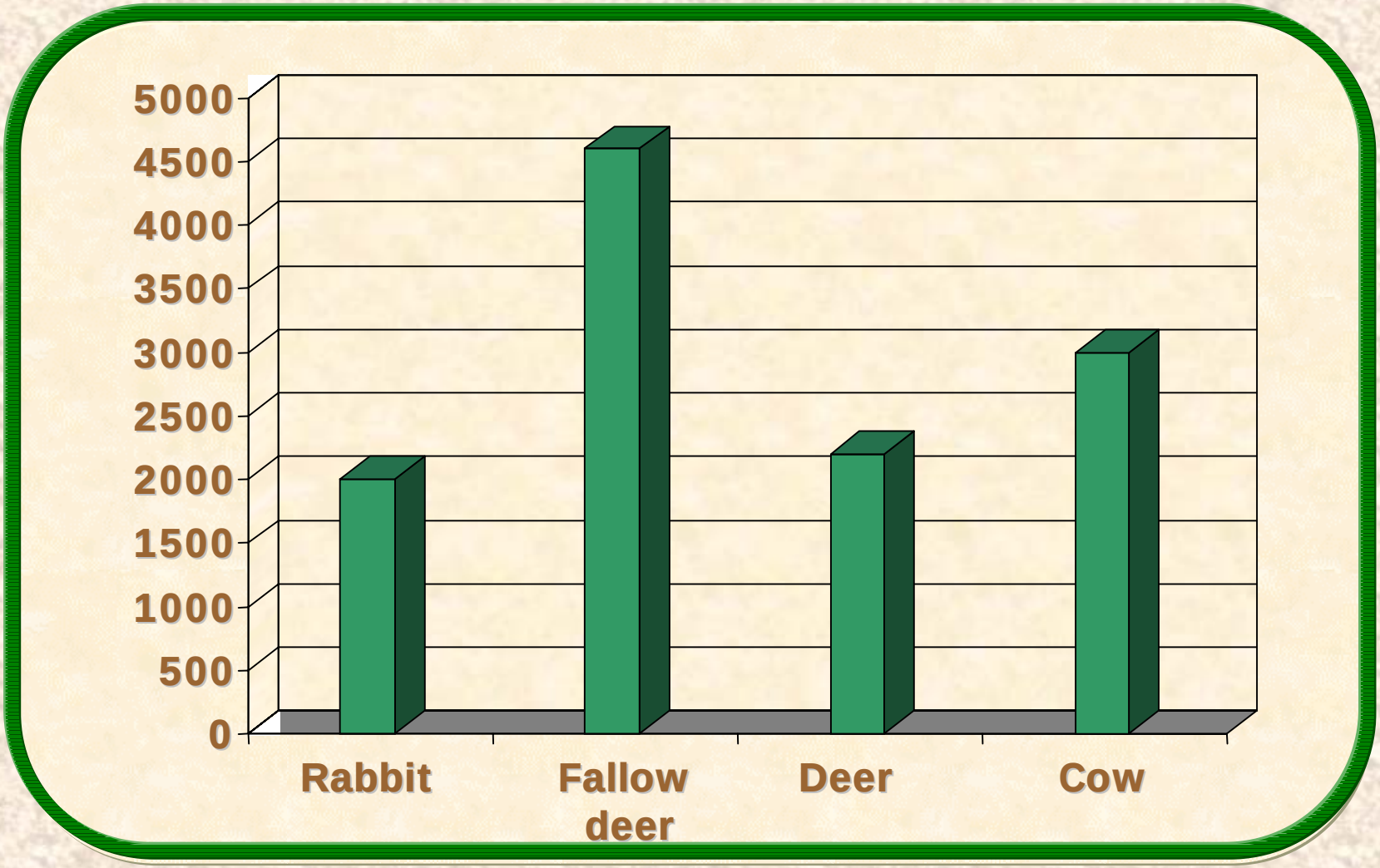

64

SPECIES DISPERSED IN DUNG (312 gr)

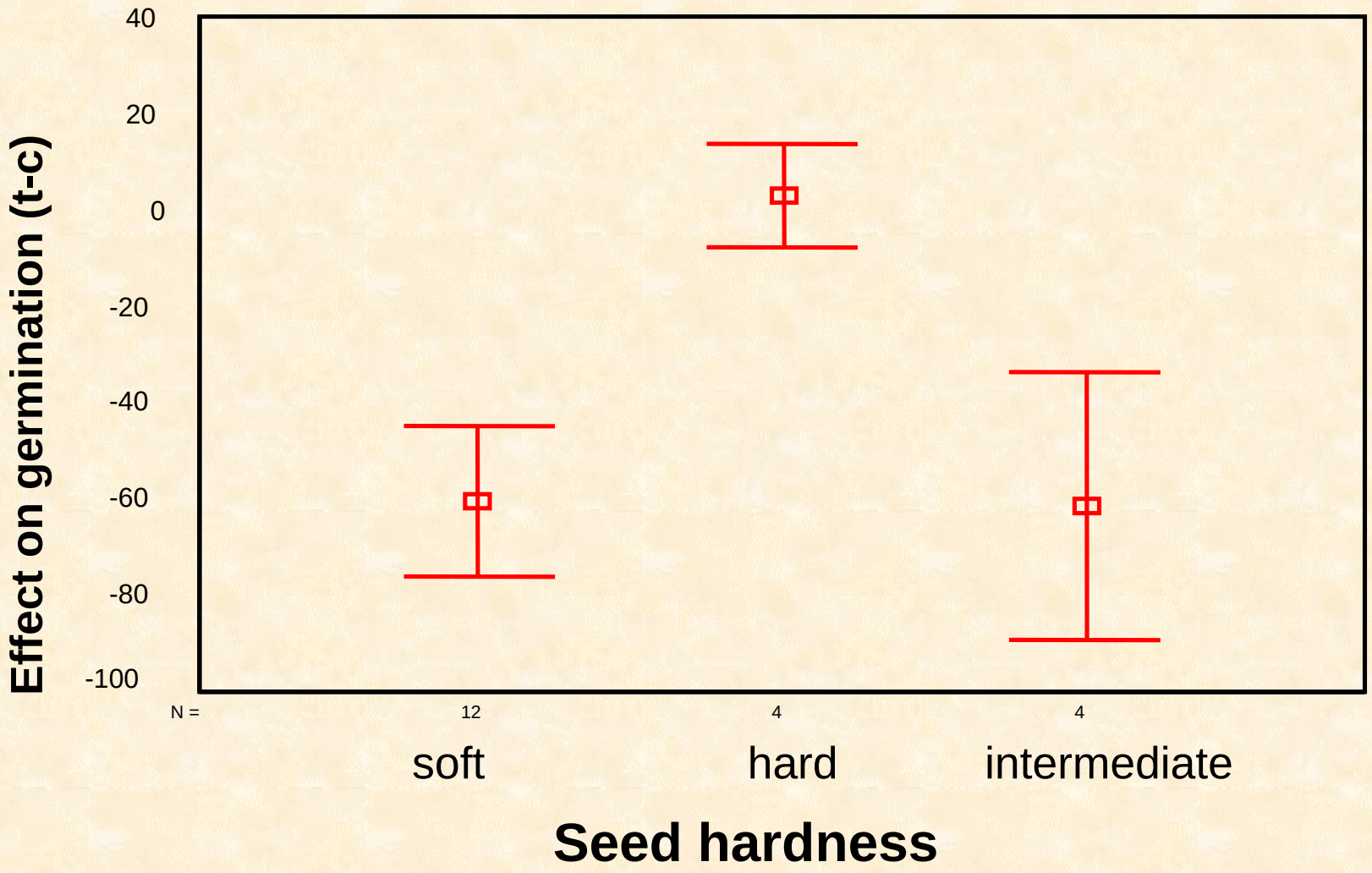


Malo & Suárez (1995), J. Veg. Sci, 6

SEEDS DISPERSED IN DUNG (312 gr.)

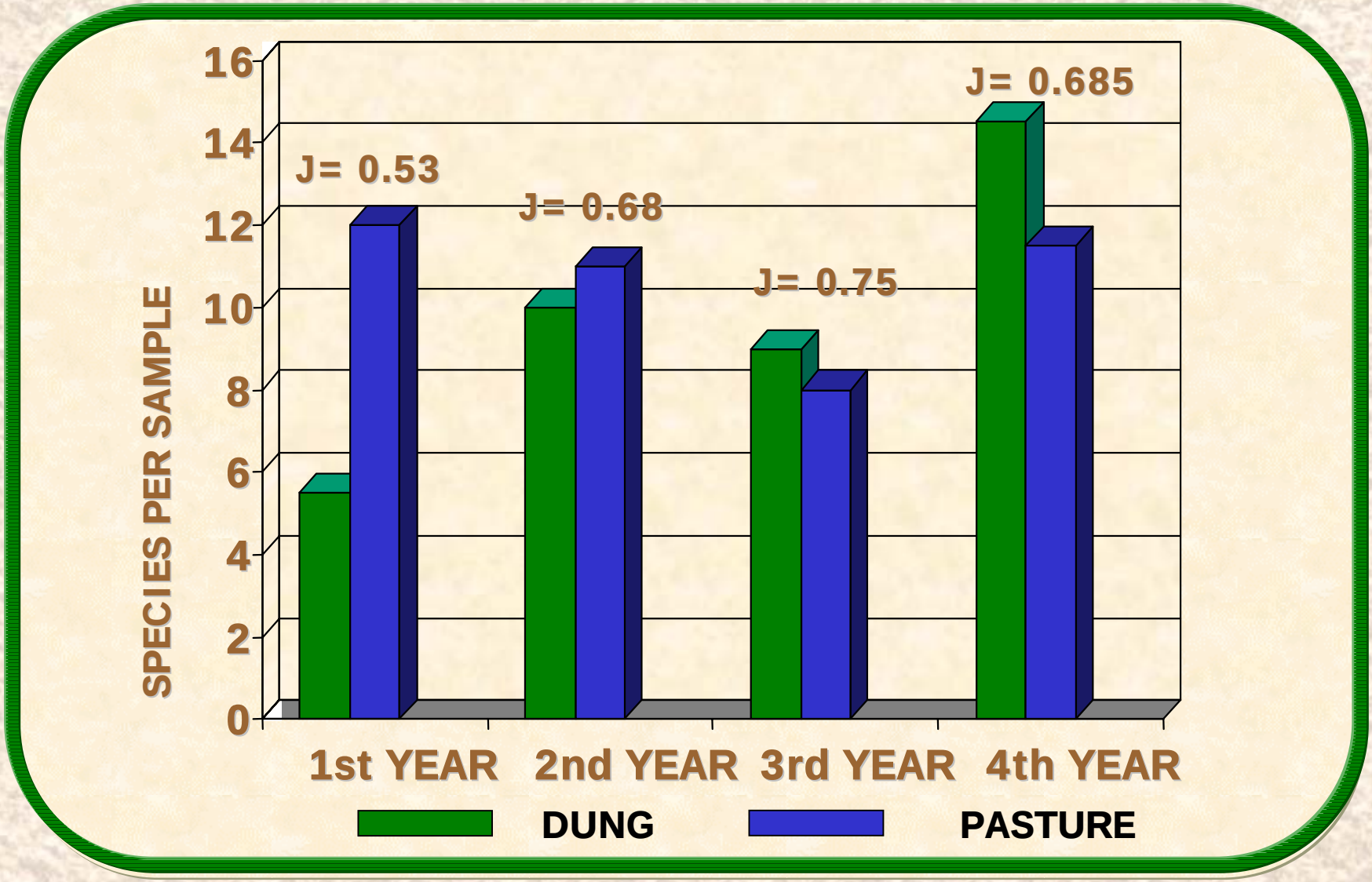


Malo & Suárez (1995), J. Veg. Sci, 6

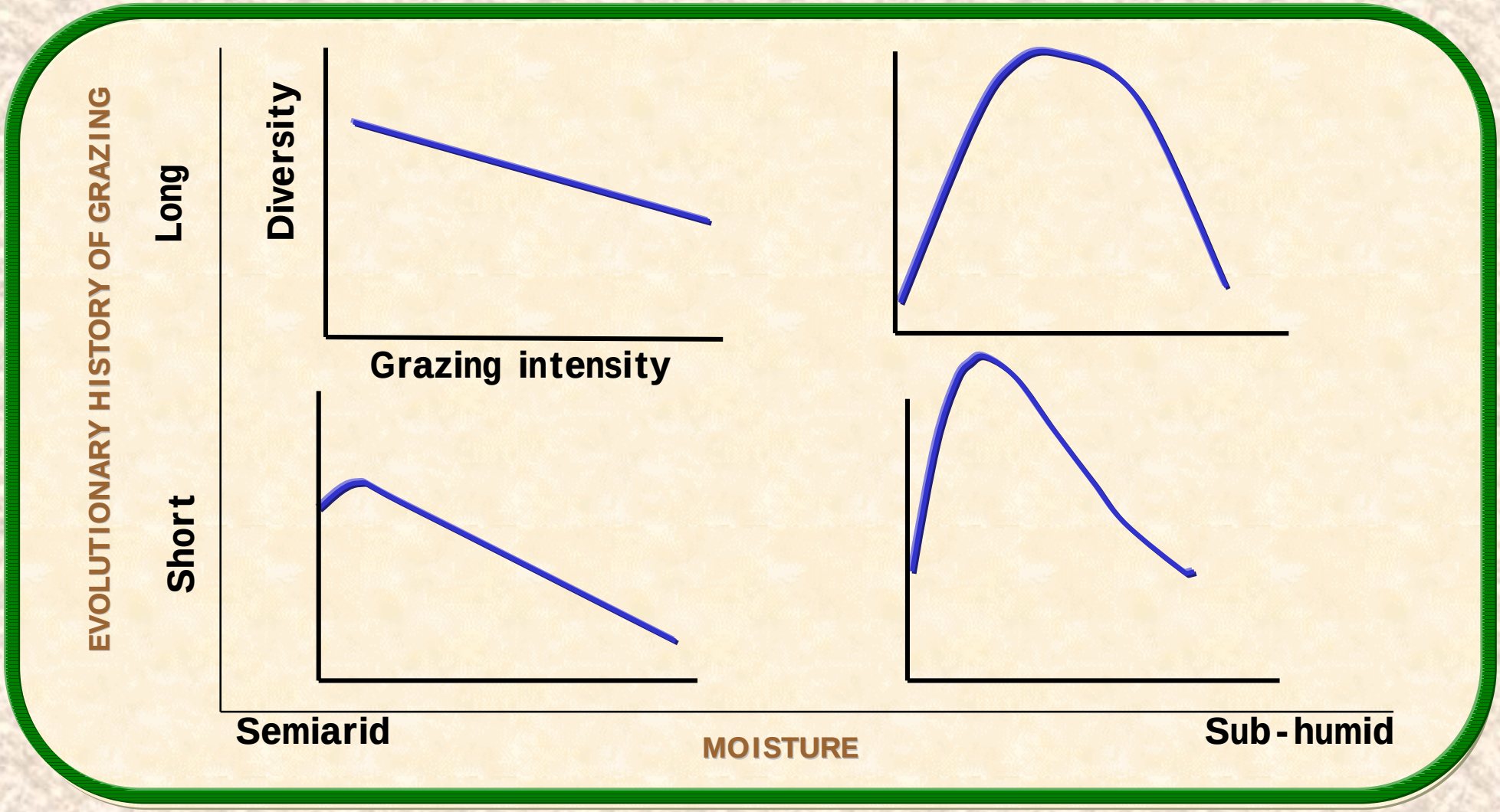


Peco & Merino (2004)

DUNG *versus* GRASSLANDS



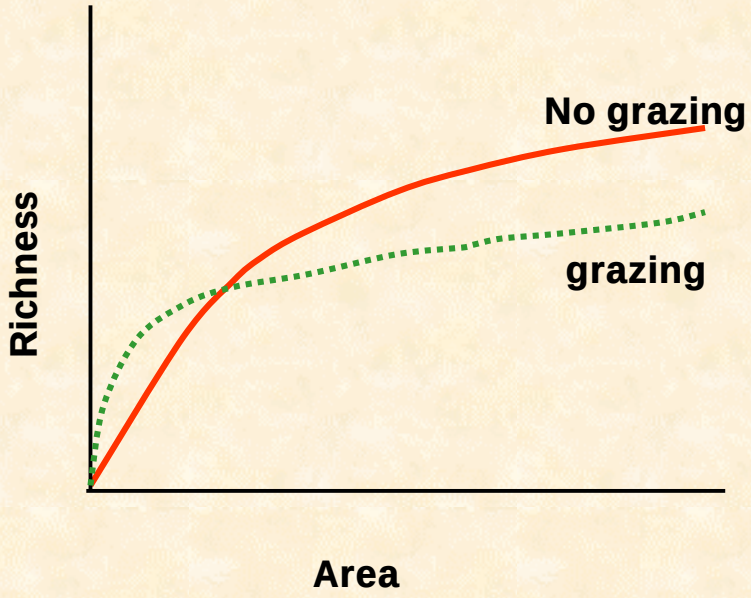
GRAZING & DIVERSITY



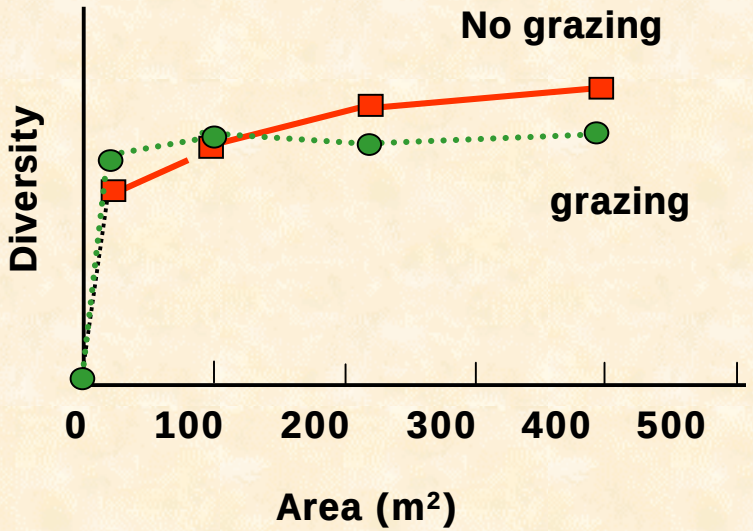
Milchunas et al. 1988, Am. Nat. 132 (1)

SCALE DEPENDENT EFFECT

a) Theoretical ratio

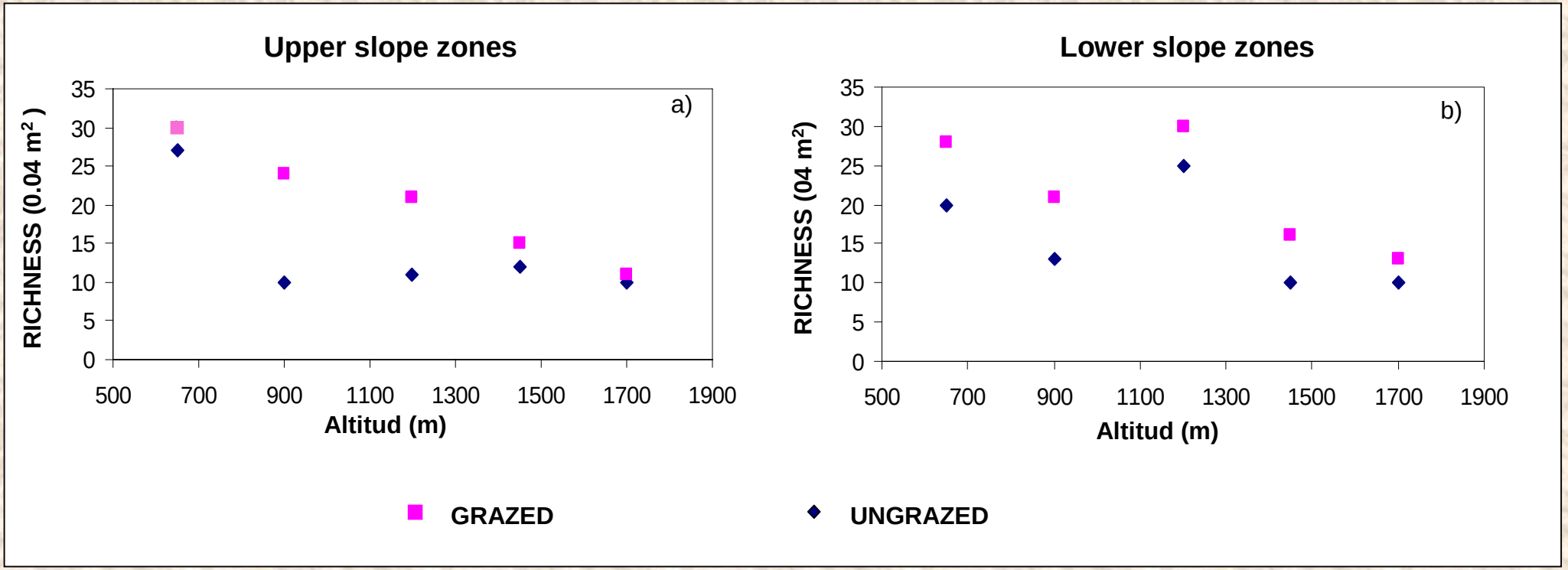


b) Ratio found

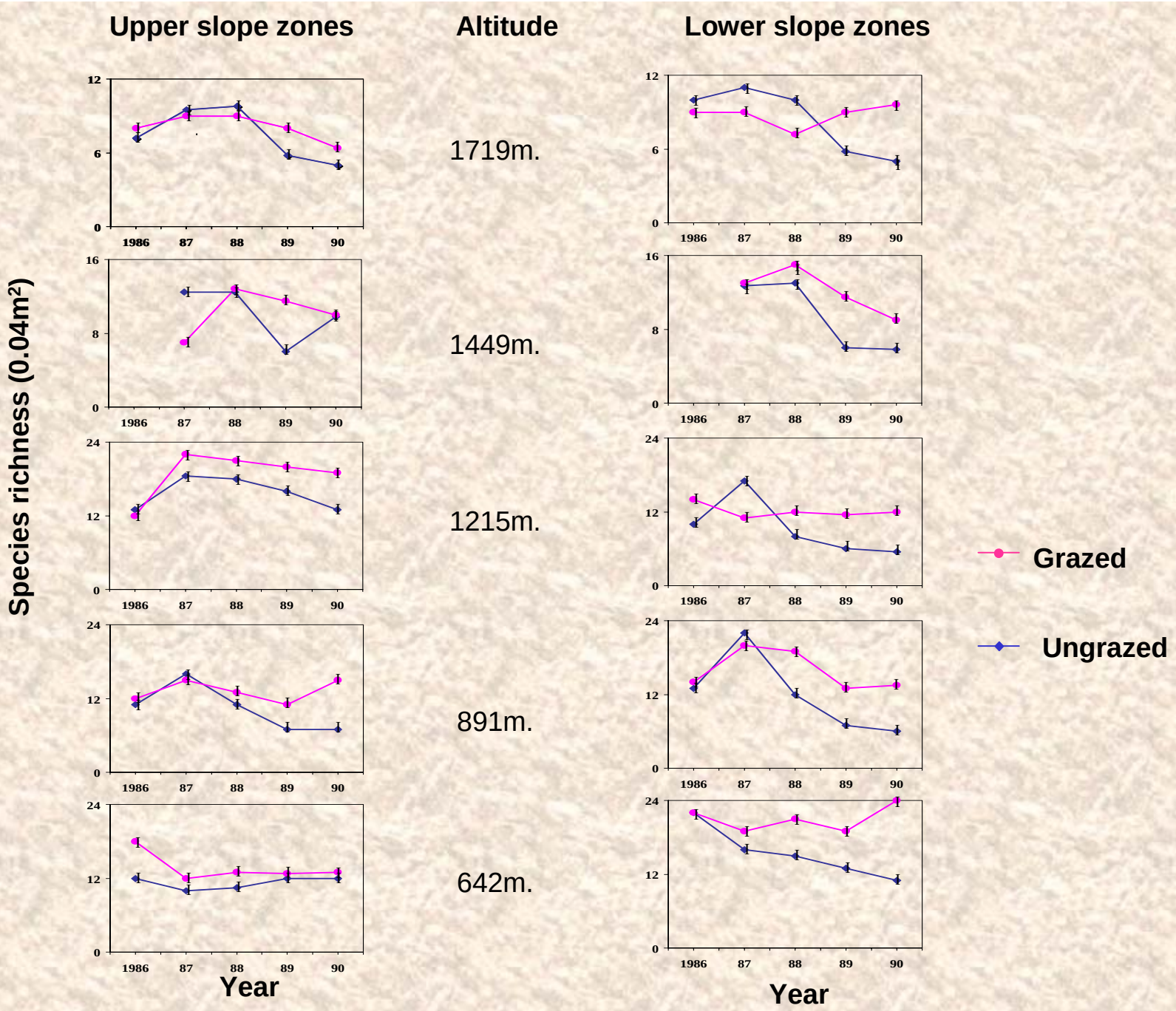


Chaneton & Facelli, 1991
Vegetatio 93

SPECIES RICHNESS AND ABANDONMENT



Peco et al., 1998. J.Veg.Sci .9


Upper slope zones
Altitude
Lower slope zones
Species richness (0.04m²)
1719m.
1449m.
1215m.
891m.
642m.
Grazed
Ungrazed
Year
Year
1986
87
88
89
90

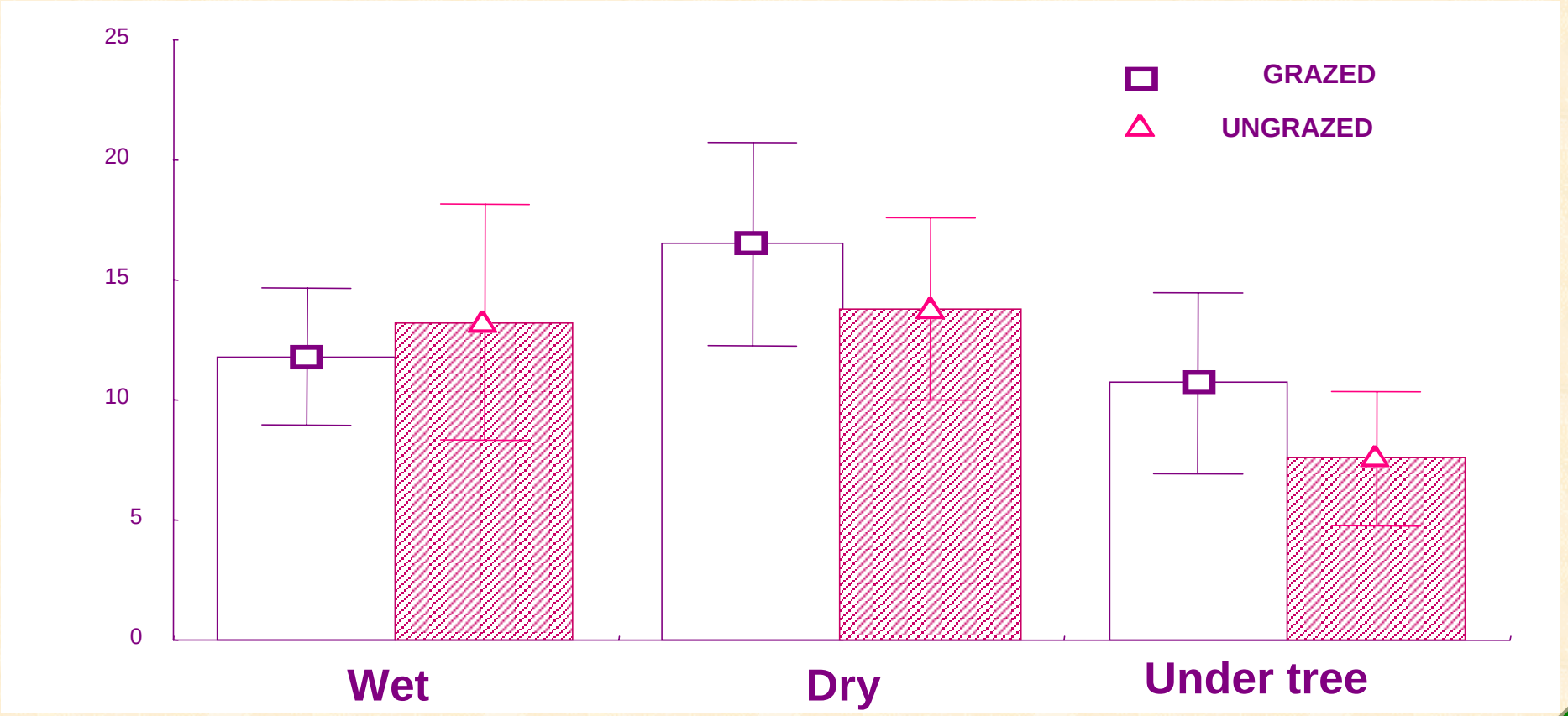
LONG-TERM ABANDONMENT

ABANDONED

GRAZED

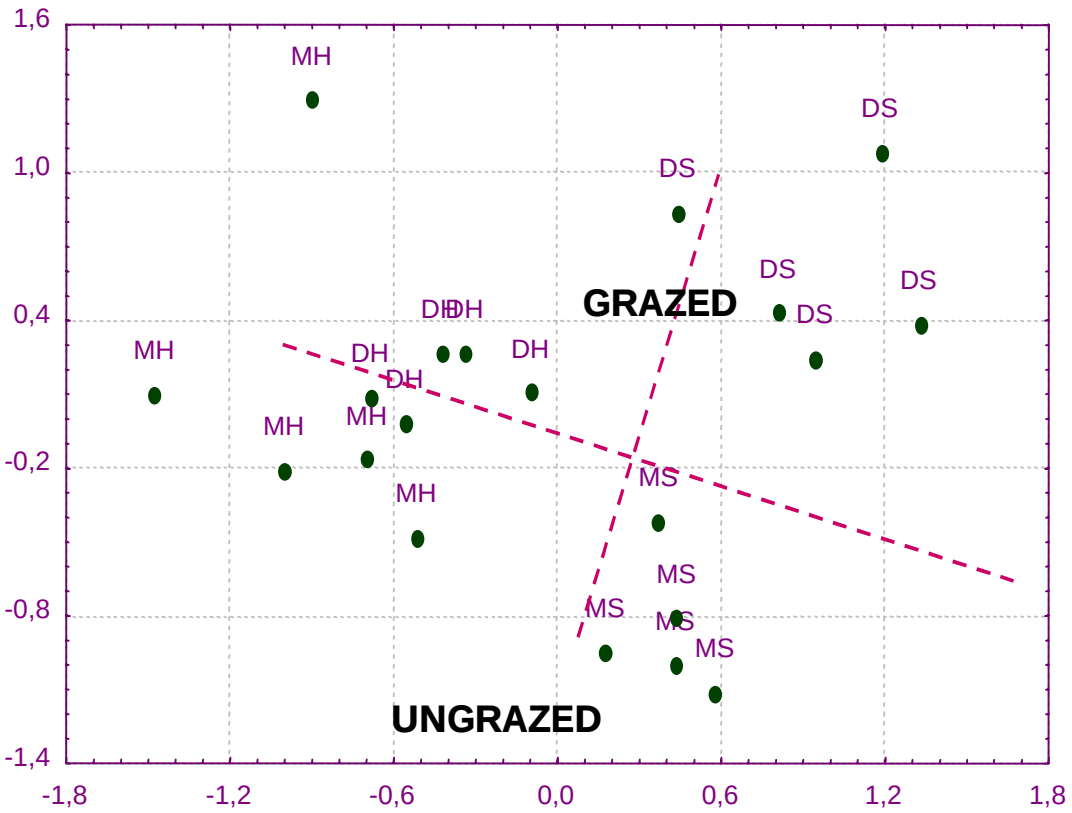
LONG-TERM GRAZING ABANDONMENT

Number of species (0.04m2)



Peco & Sánchez 2003

LONG-TERM GRAZING ABANDONMENT



STRESS=0.15

Jaccard Similarity 51%

Exclusive species:

Grazed: 43

Ungrazed: 66

Peco & Sánchez 2003

CONCLUSIONS

- **In Mediterranean *dehesa* grasslands, species richness is linked to:**
  - **Spatial gradients and periods of water availability**
  - **Low-frequency disturbances linked to traditional farm management**
  - **Extensive grazing**
    - **As a generator of low-intensity disturbances**
    - **As a seed dispersal agent**

CONCLUSIONS

- **Grazing abandonment and species richness is time dependent**

  - **Short term abandonment produces a decrease in species richness particularly in wet microsites. Nevertheless the effect is not always consistent**

  - **Long-term abandonment causes the loss of almost 50% of grassland species in dehesas, but richness at the community scale does not decline thanks to the input of new scrubland-specific species.**

CONCLUSIONS

- **Livestock management plans should therefore include:**
  - **Creation & maintenance of gradients & mosaics**
  - **Diversification of grazing intensity in space & time.**
  - **Use of different species of grazers**
  - **The presence of abandoned areas should also be contemplated for maximizing plant diversity at the landscape level.**