Grassland multiple use to develop naturalistic tourism in Mediterranean Italy

Pardini A., Argenti G., Bianchetto E., Sabatini S., Staglianò N., Talamucci P.

in

Ferchichi A. (comp.), Ferchichi A. (collab.).
Réhabilitation des pâturages et des parcours en milieux méditerranéens

Zaragoza : CIHEAM
Cahiers Options Méditerranéennes; n. 62

2004
pages 453-456

Grassland multiple use to develop naturalistic tourism in Mediterranean Italy

A. Pardini, G. Argenti, E. Bianchetto, S. Sabatini, N. Stagliano and P. Talamucci
DiSAT, Università di Firenze, Piazzale delle Cascine 18, 50144 Firenze, Italia

RESUME – *"Usage multiple des pâturages pour le développement touristique dans l'Italie méditerranéenne". La diversification de l'usage des ressources est répandue dans les systèmes pastoraux méditerranéens. Une large variabilité réduit l'efficacité mais elle favorise la stabilité écologique par rapport aux systèmes les plus spécialisés. La gestion du territoire doit être planifiée dans le but de développer le tourisme et de tisser des liens entre l'économie urbaine et rurale. Face à ces attentes, un essai a été conduit sur pâturages, forêts et coupures de combustibles dans l'Italie du Centre en appliquant une gestion économe basée sur l'adoption d'une charge animale inférieure à la charge potentielle et des interventions mécaniques fortement réduites. L'amélioration des aspects touristiques a été aussi examinée. Les résultats obtenus ont prouvé qu'on peut assurer l'entretien et à la diversification des systèmes pastoraux grâce à une exploitation animale au niveau "minimale" et à la fauche, avant l'été, de l'herbe non utilisée. De plus, ce type de gestion favorise les activités touristiques.*

Mots-clés : *Coupures de combustible, pâturage minimal, biodiversité, gestion du territoire*

Introduction

Animal stocking rates in pastures have been decreasing in most of Italian territory for decades, especially because of the progressive industrialization and urbanization. Grazing with lower stocking rates than potential level contributes to an insufficient management of the resources and a degradation of the vegetation. This problem is important also in other European Countries (Talamucci *et al*., 1996; Rigueiro *et al*., 1999; Rochon and Goby, 1999; Spatz and Papacristou, 1999).

Moreover, biomass accumulation in pastures must be avoided because it causes productivity and quality reduction and increases fire hazards. Botanical changes lead to shrub encroachment and transitional degraded stages toward forest before a good tree layer is grown again. Transitional shrubland is usually not interesting for landscape beauty. Pasture management is therefore necessary even when these resources have lost economic interest for forage production. Unfortunately intervention cost often causes abandonment and lack of control of environmental risks or fragmentation of management efforts that are not planned.

Common solutions suggest the increase of pasture productivity by sowings or oversowings, fertilizations and new cultivar introduction. Unfortunately there is scarce interest to adopt these interventions when animal numbers are already very low. However pastures get nowadays a new importance for their biologic, recreational and cultural functions. Many farms already make use of pastoral areas to organize trekking and back horse riding. These uses require a management especially planned for tourist uses.

This research is evaluating the possibility of conserving a diversified and multi-purpose pastoral system by minimal management with animal grazing as suggested by Talamucci *et al*. (1997).

Materials and methods

A trial has been carried out in a private farm of Coastal Tuscany. Climate is Mediterranean with annual rainfall 680 mm and average air temperature 14.6℃. Summer rainfall is 95 mm only and is the main limit to vegetation productivity.

The rearing system was based on local cattle and horse breeds. Rotational grazing was applied to native pastures partially derived after 5 years abandonment of subterranean clover sown pastures (97

ha, 12.3% of total area), firebreaks sown with subterranean clover (60 ha, 7.6%) and a thinned oak forest (630 ha, 80.1%).

The number of grazing animals was strongly reduced to only 44 cattle and 15 horses. These numbers are equivalent to 22% of the Livestock Units (LU) raised in the farm ten years ago (Pardini *et al.*, 1993). The study area had undergone a minimal management for 5 years before the start of the trial. New incomes came from naturalistic tourism initiated after the restructuration of some of the buildings scattered in the surrounding area and used for tourists overnights.

A preliminary calculation of the potential animal stocking rate was done using a specific computer program (Pardini, 2000). When compared to the current stocking rate it suggested that the current number of grazing animals corresponded to a quarter of the potential. For this reason grazed areas and not grazed ones controls were fenced to allow stocking rates of 0.3 LU, comparable to the ones currently applied in the farms. Grazing was allowed in the forest from December to February and from June to September; in firebreaks and pastures for the rest of the year.

Changes in botanical composition, productivity and tourist opinion of the area were studied. Measurements were done only in summer (maximum fire hazard season) from 1999 to 2000. Grazed and not grazed areas were considered in all the three forage resources.

- Botanical composition was monitored in summer by 10 linear transects in each line was 20 m long with one sampling point every 20 cm. This data was used to calculate plant richness and the Shannon biodiversity index.

- Biomass : 10 samples of annual growth per resource in June, inside exclusion cages. Only herbaceous and low shrubby vegetation were considered.

- Sward height was calculated in summer as the average of maximum heights at every sampling point of the linear transects.

- Tourist opinion was observed from interviews to 50 customers, comprising landscape beauty estimates and suggestions for improvement).

- ANOVA was done on all data sets.

Results and discussion

Botanical composition and biodiversity index in summer

The total plant richness found in August in the three forage types reached 58 species. Species are not listed for simplicity and only their number in each resource is reported (Table 1).

Table 1. Number of plant species and Shannon index of biodiversity in the 3 forages resources. Data refer to August 2000

	Species number		Shannon index	
	Grazed areas	Not Grazed	Grazed areas	Not grazed
Thinned forest	27 a*	26 a	1.30 a	1.09 a
Sown firebreaks	39 a	31 b	1.33 a	1.10 b
Native pastures	35 a	28 b	1.25 a	0.91 b

*Means in the same row followed by a common letter are not significantly different at the 5% level.

Plant richness remained the same in the grazed or not grazed forest. However, biodiversity index was reduced where grazing was not allowed. Unpalatable shrubby species (e.g. *Juniperus communis, Erica scoparia, E. arborea, Cistus salvifolius, Sarotamnus scoparius, Spartium junceum*) were spread more in the not grazed area while herbaceous legumes presence (e.g. *Trifolium* spp., *Vicia* spp.) was reduced. These results suggest that botanical richness was reduced slowly, probably because grazing was limited to only short periods and had a reduced effect.

Plant richness remained higher into both grazed firebreaks and pastures in comparison to ungrazed areas. Biodiversity was also maintained higher values under grazing. There was a diffusion of *Lolium multiflorum* and, especially, of *Cynodon dactylon*. These results suggest that grazing, even at a low animal stocking rate, contributed to maintain good vegetation condition.

Biomass

Biomass in June was low in the forest but there was little difference between grazed and ungrazed areas (Table 2), probably due to the late start of grazing on old vegetation that had lost palatability.

Table 2. Biomass (DM t.ha^{-1}) in June (average of years 1999 and 2000)

	Grazed areas	Not Grazed
Thinned forest	0.5 a*	0.6 a
Sown firebreaks	4.5 b	6.3 a
Native pastures	3.9 b	6.1 a

*Means in the same row followed by a common letter are not significantly different at the 5% level.

Biomass was high in firebreaks and pastures but there was little difference between the two resources. Grazing reduced biomass of firebreak vegetation to 71.4% of the amount present in the ungrazed area. Grazing reduced biomass to 63.9% in the pasture. These reduction rates of fuel biomass can be considered as good under so extensive grazing management.

Sward height

Sward height in the forest was slightly higher that in firebreak and the pasture but vegetation was much more heterogeneous with low herbs and scattered taller shrubs (Table 3). Grazing had a consistent effect on the vegetation and on the average of the three resources, it reduced sward height to one third of ungrazed areas. Short sward height is preferable because it warranties reduced risks of flame transmission from grass to shrubs and then to the trees.

Table 3. Sward height (cm) in August (average of years 1999 and 2000)

	Grazed areas	Not Grazed
Thinned forest	15 b*	43 a
Sown firebreaks	12 b	39 a
Native pastures	10 b	38 a

*Means in the same row followed by a common letter are not significantly different at the 5% level.

Tourist opinion of the area and suggestions

Tourists appreciated much more grazed than the not grazed ones and their preferences scored a general esthetic aspect (100% of the interviewed expressed this preference), because of the easier walking (88%), easier back horse riding (22%) and reduced risks of snakes (12%). Tourists also suggested some possibilities to improve the beauty of the site and quality of the touring services. They included equipment of resting areas (100%), higher naturalistic education of guides (98%), improved conditions of trekking lanes (73%) and more modern equipment of gates set to control grazing animals (53%).

Conclusions

Minimal grazing maintained vegetation productivity and land beauty in better conditions than no grazing. Fire ignition and flame diffusion risks were decreased by animals that reduced fuel biomass and herbage height. Trends of slow changes in vegetation also persist if minimal grazing is applied.

However these might be further limited and eventually reversed by integrating agro-silvo-pastoralism and land use planning. It will be important to concentrate animals and management efforts especially for maintaining good conditions in farm areas considered attractive for tourism. On the contrary, the new introduction of forest can be managed in other parts of the farm where pasture and tourism are not important. Interviews with tourists suggest that links between rural economy and naturalistic tourism can be developed, especially if agronomic means of management will be used together with other land care actions and training of the guides.

References

Pardini A. 2000. *Pascoli e foraggere tropicali e subtropicali.* Ipertext CD-Rom, version 2.1. Publ. Europlanet Informatica S.r.l., Florence. Comprises Euro-Alleva. computer program (Italian-English).

Pardini A., Piemontese S., Argenti G. 1993. Limitazione degli incendi boschivi con il pascolamento di bande parafuoco inerbite in Toscana. *L'Italia Forestale e Montana,* 6, 342-352.

Rigueiro Rodriguez A., Mosquera Losada M.R., Lopez Barreiro M. 1999. Production and sown species evolution of different pasture mixtures growing under birch (*Betula alba*). In: *Grasslands and woody plants in Europe*. EGF conference Vol. 4, 403-408.

Rochon J.J., Goby J.P. 1999. Relations between the herding system of goats and the production of milk and the effect on the environment in south France. In: *Grasslands and woody plants in Europe*. EGF conference Vol. 4, 409-412.

Spatz G., Papacristou T.G. 1999. Ecological strategies of shrubs invading extensified grasslands: their control and use. In: *Grasslands and woody plants in Europe.* EGF conference Vol. 4, 27-38.

Talamucci P., Argenti G., Pardini A., Piemontese S., Staglianò N. 1997. Use of annual self-reseeding legumes in an oak forest in Central Italy. *Proceedings of XVIII Int. Grassl. Congr.,* Canada, n. 1, 6,3-6,4.

Talamucci P., Argenti G., Pardini A., Scarpelli P., Staglianò N. 1996. Examples of high pastures management with minimal stocking rate in an area of Italian Alps. *IX meeting of the group FAO-CIHEAM on Mountain Pastures,* Banska Bystrika (Slovacchia), 20-23 June 1996.