

## Extensive sustainable grazing



Extensive sustainable grazing is based on a stable animal density below or equal to a sustainable stocking rate. It represents a management practice that protects grazing land from soil erosion by maintaining a moderate annual vegetation cover and is useful to reduce rainwater runoff, and soil erosion.

## Soil threats: soil erosion, land degradation, and desertification



Grazing pressure has an effect on both soil properties and vegetation cover. When the number of animals grazing a pasture exceeds the land's grazing capacity, a marked decline in natural vegetation occurs. Soil erosion rates increase as vegetation decreases. A vegetation cover of 40-50% is a critical threshold below which accelerated soil erosion occurs. Soil compaction resulting from animal trampling has a secondary negative impact by degrading soil structure, reducing the infiltration rate, and accelerating soil erosion.

## Scientific evidence from experiments in Crete



Soil erosion	Extensive overgrazing	Extensive sustainable
Runoff (mm /year)	22.8 (0.7)	11.4 (1.0)
Sediment loss (g/ m <sup>2</sup> / year)	21.5 (0.8)	11.1 (1.2)

Experiment to measure soil erosion rates under extensive sustainable grazing and extensive unsustainable grazing. The photo shows an area highly degraded by past extensive overgrazing accompanied by accelerated soil erosion rates and resulting in shallow soils. Today it is protected by decreasing the number of animals to a sustainable rate.

A three year experiment, carried out in Crete has shown a significant decrease in surface water runoff and sediment loss under extensive sustainable grazing compared to extensive overgrazing (numbers in parenthesis correspond to standard deviation) (Kairis et al., 2015).

## Location of demonstration site



The demonstration event organized in collaboration with the ELGO-DIMITRA Organization, Institute of Olive Groves, sub-Tropical Plants and Vines located in Chania, Crete (Address: Avenue Soudas 131, Chania, Crete), on July 4, 2019.

## Further details about extensive sustainable grazing

Extensive sustainable grazing can be achieved by grazing control management. This practice aims to establish an equilibrium between herbivores and the resource base of the rangeland so that sustained production is ensured. It can be achieved by regulating the number and type of livestock and the timing and duration of their grazing in a pasture.

Extensive unsustainable grazing is one of the most diffused land management problems at the global scale and is especially associated with marginal, depopulated and disadvantaged rural areas whose landscape is dominated by pastures, low value-added cropland and fallow land. Extensive unsustainable grazing is a key factor in the degradation of agro-forest Mediterranean landscapes. Grazing intensification induces serious problems in the ecological functioning of Mediterranean grasslands. Extensive overgrazing is regarded as a serious environmental pressure on natural areas and a well-known determinant of desertification risk, especially in areas where morphology, climate, vegetation cover and soil are unsuitable for intensive agricultural use.

A standard way of estimating grazing intensity is to consider the Stocking Rate (SR), namely the number of animals per unit area during the grazing period as a benchmark to assess grazing sustainability. If SR is higher than its grazing capacity (sustainable stocking rate) then overgrazing occurs. Extensive sustainable grazing occurs when the number of animals grazing the land is equal or lower than sustainable stocking rate.

Extensive sustainable grazing is associated with lower water runoff, reduced sediment loss, a higher amount of water stored in the soil and lower soil temperature. Extensive overgrazing can be characterized as a driver of land degradation in southern Europe and points out the contribution of sustainable management of pastoral landscapes in the mitigation of desertification risk.

### References

Or. Kairis, Ch. Karavitis, L. Salvati, A. Kounalaki, C. Kosmas. 2015. Exploring the Impact of Overgrazing on Soil Erosion and Land Degradation in a Dry Mediterranean Agro-Forest Landscape (Crete, Greece). *Arid Land Research and Management*. <http://www.tandfonline.com/loi/uasr20>



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