

# Science for Environment Policy

## High-nature-value grasslands can be maintained by alternating between mowing and grazing

**Scientists recommend policies that alternate between mowing and grazing** to manage Europe's high-nature-value grasslands. This comes after a new seven-year study found that a high plant-species diversity helps grasslands to maintain productivity and to resist depletion of phosphorus caused by livestock grazing and depletion of potassium caused by mowing.

**Grasslands with high levels of [biodiversity](#) are important for Europe** as they support healthy soils and large amounts of wildlife. Extremely valuable and diverse areas are termed high-nature-value grasslands and become part of EU agricultural policy, often being maintained under [long-term management agreements](#). To prevent degradation of high-nature-value grasslands, common practices include mowing the land or grazing with livestock. Land managers are also usually restricted from applying fertilisers.

However, there is scarce evidence on how these different practices affect the nutrient levels of the plants and [soils](#), and therefore the grassland productivity. To address this knowledge gap, in 2004 researchers established long-term experiments at two sites in the White Carpathian Mountains, between the Czech Republic and Slovakia. At each site they divided the grassland into plots, and applied different management treatments: mowing in mid-July, livestock grazing in June and August, or being left fallow (untouched). Seven years later, the scientists assessed the amount of biomass, amount of plant diversity, and the nutrient levels in both the plants and the soils.

The scientists found that plots grazed by livestock showed the lowest amount of phosphorus available for plants in the soil, and plots that were mown had the lowest available potassium. Yet there was no difference in levels of above-ground biomass between grazed, mown and fallow plots.

However, the management treatments did change the biodiversity, as different plants were better adapted to growing in different nutrient conditions. Over time, species composition between the management plots diversified. Grazing was found to facilitate more grasses (plants with shallow but dense root system), while mowing allowed more forbs (plants rooting usually very deep in the soil) to grow.

The scientists suggest that a high level of plant biodiversity in grasslands can help to sustain their productivity over time when little or no fertilisers are used. For example, grasses and forbs provide grasslands with different yet equally important benefits. Forbs can help to prevent shortage of phosphorus by mobilising its reserves from deep soil layers and grasses aid in efficient capture of nitrogen from mineralisation of plant litter on the soil surface or from atmospheric deposition. These nutrients are both important for maintaining the productivity of the grasslands.

Consequently, the scientists concluded that grassland management practices should attempt to facilitate the growth of both grasses and forbs, since they are valuable components of grassland productivity. They recommend a mix of grazing and mowing could be used to encourage co-existence of both forbs and grasses, and to maintain optimal nutrient levels in grassland soil.

As world reserves of superphosphates are quickly decreasing and mineral fertilisers negatively impact ecosystems, the researchers say that agri-environmental measures that encourage higher plant biodiversity could help to sustain stable grassland biomass under low or nil inputs of fertiliser.



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