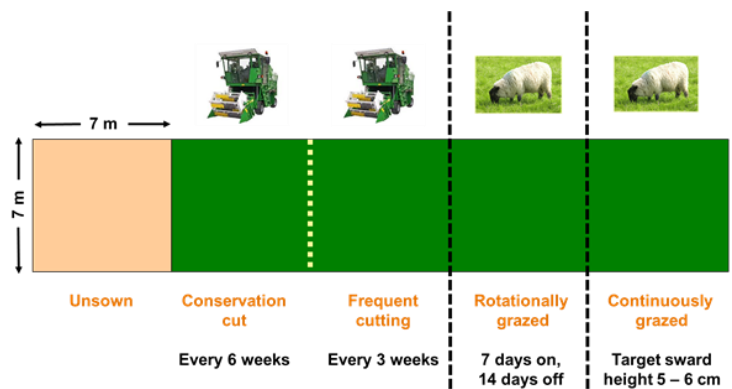


Grasslands for challenging environments

IBERS is currently conducting a multi-million pound research programme, funded by BBSRC, to improve the economic, productive and environmental sustainability of crops in the face of climatic and political change. Related project work with grassland is taking place at four points across a 'Challenge Gradient'. We have sites at altitudes of ~70 m and ~150 m above sea level at Trawscoed, and sites at ~230 m and ~340 m above sea level have been selected at Pwllpeiran. Detailed surveys have shown the underlying soil chemistry and current sward compositions of the different sites was broadly similar, and that the climatic conditions across the gradient are representative of those experienced by 80% of UK grasslands.

Experimental work led by Pwllpeiran staff is testing the effects of multiple stresses on grass and legume mixtures over multiple seasons and years. The two contrasting multi-species mixtures that have been sown are typical of commercial mixtures and have been optimised to deliver 1) high productive performance, and 2) longevity. We are tracking changes in their botanical and chemical composition over time under four different management regimes: 1) continuous grazing; 2) rotational grazing; 3) frequent cutting/simulated grazing (cuts at 3 week intervals; similar to the cutting regime used when testing varieties); and 4) conservation cutting (at 6 week intervals).

The project is using the very latest molecular techniques to monitor shifts within plant populations as well as the impact of the dietary preferences of the stock grazing the plots. This will shed light on plant-to-plant competition and the way different sward components respond to varying frequencies and types of defoliation. The impact on related nutritional value is also being quantified. The results will feed into plant breeding programmes and form the basis of mathematical models giving a deeper understanding of interactions between resource use efficiency, sward yield optimisation and environmental services.



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