

Forage legumes in upland grazing systems

Sales of forage legume seeds have increased in recent years for two main reasons. Firstly, legumes such as red and white clover can offer high quality, home-grown source of protein for ruminants. Previous studies at IBERS have demonstrated positive impacts from the inclusion of legumes at key stages of the sheep production cycle; from pregnant ewes, to weaned lambs, to store lambs. The best responses were recorded for red clover, a plant which not only has a high protein content but which contains an enzyme (polyphenol oxidase; PPO) which protects this from breakdown in the rumen and the silo. This significantly improves nitrogen utilisation.

Secondly, legumes are nitrogen fixing, which means they have the ability to convert atmospheric nitrogen into a form that both the clover and companion grass can use, reducing the need for inorganic fertiliser.

However, the uplands present challenges for growing clover that can make current commercial varieties unsuitable. These include acidic soils, reduced soil fertility, variable water availability, lower temperatures, and shorter growing seasons. Recent trials at Pwllpeiran have been testing lines specifically bred for

their cold tolerance, drought resistance and efficiency of nutrient uptake. These lines include material selected from alpine regions around Europe and Asia, as well as novel hybrid lines developed from Caucasian clover.



In another study we are investigating the feasibility of using a less common legume, lotus (birdsfoot trefoil; *Lotus corniculatus*), in upland grazing systems. As with other forage legumes, lotus is high in protein. However, it also contains condensed tannins, which (like PPO in red clover) improves the efficiency of protein digestion, reducing nitrogenous losses to the environment and improving animal performance. They can also reduce methane emissions from ruminants and have anti-parasitic properties for grazing animals. While lotus can struggle to compete with companion grasses in productive lowland areas, the more challenging environment in the uplands could suit it better.

Contact for more information:

Dr David Lloyd

email - dal35@aber.ac.uk

tel - 01970 823196