

James Small, The Mendips, North Somerset



Soil protection and livestock production; Biodiversity benefits from intensive grassland

James Small is a livestock farmer on the Mendip Hills in Somerset and is currently investigating the benefits of extensive grassland systems on environmental management and production efficiency.

James' family farm lies on a limestone plateau above the head of the Cheddar Gorge in North Somerset. The 263 hectares include grassland, Sites of Special Scientific Interest (SSSIs). James currently runs a 100 plus head of cattle alongside 1400 breeding ewes on a share farm agreement. The farm also contract grazes the surrounding nature reserves through the summer months.

James, working alongside the Somerset Wildlife Trust has been trialling the legume and herb rich grass leys for three years to investigate the benefits of intensive grassland systems to produce high quality silage.

The legume and herb rich grass ley

The grass ley contains a range of grasses, legumes and herbs which are sown as temporary leys for livestock feed. The range of grasses, herbs and legumes has a variety of benefits for the soils:

- Improved soil structure due to the diversity of rooting depths and variations in growth rates. For example chicory develops much deeper roots than other species in the mix, breaking down any issues such as compaction within the soil profile and accessing nutrients from lower levels of the profile. Soil structure is vitally important for the sustainability of the soil. Good soil structure enables good crop development and the most efficient nutrient absorption and uptake from the crop. Well-structured soil allows the free movement of air and water through fissures (cracks) between the structural units. Improved soil structure also benefits other aspects of the natural capital through diminished water run-off and sediment loss into nearby waterbodies.
- Improved root structure enables improved water absorption and water retention capabilities.
- Improved biological function. This is important to good quality soil and factors such as the increase in earthworms show that the soil quality as a 'living organism is improving thus sustaining life. The grass Legume and Herb rich grass ley has improved the soil through the variety of factors:
 1. Lower nitrogen application. The species mix can currently be sustained with lower levels of inorganic and organic fertilisers.
 2. Increased organic matter. There have been some positive benefits on the soil biology within the short period of time; however James expects that with continued use of the grass ley then the organic matter will improve alongside the soil structure. James has noticed an increase in earthworms which is a key indicator of improved soil biology.
 3. Silage and forage yields. These have increased significantly since the implementation of the grass ley system.

Improving soil organic matter	Stronger root structure due to the range of species Reduction of nitrogen application
Reducing the risk of soil erosion	Stronger, deeper root structure
Reducing compaction on land	Lower number of 'passes' due to reduced nitrogen application Improved soil structure= increased permeability.

Practical application

The seed mix is easy to use and was successfully established during farm trials using either deep or shallow cultivation techniques. As the legume and herb rich grass ley seed mix contains many small-seeded varieties, the best results were obtained when the mix was broadcast sown into a fine and firm seed bed, which offered good contact between seed and soil and led to a more even plant distribution.

Productivity benefits

The legume and herb rich grass ley has produced high yields over the last three yields. The silage has shown to have good growth rates, been of good quality and is easily chopped to ease digestion.

Wider Environment and future benefits

The legume and herb rich grass ley was primarily implemented to explore the benefits of developing a landscape scale network to the wildlife of the Mendips and North Somerset. James leaves a 6 meter buffer strip around fields adjacent to the SSSI's so that a varied plant structure promotes the continuity of wildlife resources.

James rents land out to local outdoor pigs producers, as he looks to investigate the impact of outdoor pigs on his land with hope to see positive benefits due to the high levels of nitrogen in pig manure. James is currently investigating the ability of the grass ley to condition soil alongside outdoor reared pigs.

The legume and herb rich grass ley has shown to benefit the soil and its biodiversity in a range of ways. It acts as a soil conditioner and has integrated well into the farming system by producing high quality forage for the cattle alongside benefiting the wider environment. The Legume and herb rich grass ley has shown that you can improve and protect your natural resources alongside productive and profitable agriculture.



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