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Science & Research: SARIC DiverseForages Project

SARIC DiverseForages Project trial at our Centre for Diverse Farming

Aim: To determine which level of forage plant species diversity provides the best forage, together with benefits for the soil, environment and livestock production.

Partners: BBSRC-NERC Sustainable Agriculture Research and Innovation Club (SARIC) project led by the University of Reading and in collaboration with Duchy College, Rothamsted North Wyke, and Cotswold Seeds/Honeydale Farm.

Duration: 5 years (2016-2020)

Our new FarmED centre for farm and food education, currently being developed at Honeydale Farm, is all about promoting diversity, making it an ideal satellite farm for the DiverseForages Project. The aim of this project is to experiment with a range of forage mixtures with increasing levels of plant species (including grasses, legumes and herbs) diversity in order to determine which provides the best forage, together with benefits for the soil, environment and livestock production.

Data is being collected from a monoculture (Perennial Ryegrass), as well as mixtures containing six, twelve and seventeen species, which will all be compared to fertilised perennial ryegrass (Control) at the multiple sites over the five year period.

The first 2 years have focused on establishment, grazing management and species composition, with measurements of biomass yield and species persistence made on agronomy trial plots throughout South England.

In the third year, there will be more detailed work carried out. This will focus on how the properties of the different forages affect livestock production at the University of Reading's Centre for Dairy Research (CEDAR), assessing data on growing Angus and Holstein steers during grazing over spring, summer and autumn in 2018 and 2019. Nutrition studies will continue during the winters of 2019 and 2020, when cattle are being fed conserved haylage from the three mixtures and the ryegrass control.

Grassland comprises 50 % of the total UK land area and is a crucial resource for the ruminant livestock industries within the

agricultural sector. This grassland is predominantly sown with ryegrass, which is high-yielding species and provides, digestible, quality forage, but is reliant upon the application of sufficient nitrogen fertiliser. It's also susceptible to both drought and water logging. Nitrogen fertiliser is expensive and has a high carbon and nitrogen footprint. Therefore, it is important to consider whether there are viable alternatives to pure ryegrass pasture that are more environmentally friendly, resilient, and productive.

What are the diverse forages?

There are many plants other than ryegrass that can be used for forage including legumes (e.g. clover) and herbs/forbs (e.g. chicory or plantain). Research has shown that grass pasture can be enhanced by the addition of legumes and herbs. Legumes capture atmospheric nitrogen as compounds that are used by the plant, replacing the need for nitrogen fertiliser, and some legume/herb species are deep rooting, improving soil structure and providing resilience to drought and flooding. In this way, mixed species work together to fulfil different ecosystem functions, potentially increasing forage yield of the whole pasture above the yield of any one species sown alone and with less need for nitrogen fertilizer.

Results so Far

Results from the experimental plots will be available after the third year of sampling during the 2019 growing season. Last year the DiverseForages Project team held a workshop to bring together farmers and scientists to learn from each other's experiences of grazing multi-species swards. The farmers present agreed that spring sowing, combined with a firm seedbed produced the best results for diverse forages. Whilst there were mixed opinions over the use of ploughing, all agreed that taking the time to produce a quality seedbed was worth it considering the cost of the seed.

Aiming for long term leys lasting at least 4 years was the predominant opinion of the group, together with a plea for simpler management guidelines from the research community.

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