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ClieNFarms EIP-AGRI Practice Abstracts

White clover in the Irish pasture-based system

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The first steps to mitigating nitrous oxide emissions from pasture-based ruminant production systems are establishing there are tools and options to reduce the amount of chemical nitrogen (N) used to produce herbage for livestock to graze.

In Ireland, there are targets in place to reduce N fertilizer use by 25% by 2030. White clover is a legume species that fixes N from the atmosphere through biological nitrogen fixation making it available to the plant. This means that the quantity of chemical N required can be reduced and consequently nitrous oxide emissions can be reduced. Irish research shows that chemical N fertiliser application can be reduced by up to 40% in grass-white clover swards that have an average sward clover content of 20%, without negatively affecting herbage production. Reducing chemical N fertiliser application will reduce the carbon footprint of milk and meat products, as well as absolute emissions.

Compared to grass-only swards, Irish and international research shows that white clover leads to increased herbage quality, dairy cow dry matter intake, nitrogen use efficiency, milk production and live weight-gain. On dairy farms, grass-white clover swards have been reported to have increased net profit by €108-404/ha compared to grass-only swards due to reduced chemical N fertiliser use and increased milk solids production per cow. Therefore, clover is not only important for reducing emissions but also for increasing animal performance and profitability.

Establishment and persistency of white clover within the sward can be a challenge on farm. Farmers should have a plan in place to establish white clover in all paddocks over a five-year period using both re-seeding and over-sowing. Average annual sward clover content in each paddock should be at least 20%. To improve establishment, soil pH should be greater than 6.5 and a minimum soil index of 3 for P and K. Grazing management is also key for establishing white clover, the sward must be grazed tight in the first year to allow light to reach the base of the sward for stolon production. Care must also be taken to minimise the risk of bloat in paddocks with high clover content.



Figure 1: White clover swards on an Irish pasture-based dairy farm. Source: Teagasc.



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