

Title: Strategies to increase white clover use in intensive dairy production systems

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Project Leader: Dr Deirdre Hennessy, Teagasc, Animal and Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork



Abstract:

White clover is the most widely sown legume in temperate regions including Ireland. It is ideally suited to grazing due to its stoloniferous growth habit. The main benefits of incorporating white clover in grass swards are its ability to fix atmospheric nitrogen (N) and make it available for plant growth, increased feed value and higher animal production compared to grass-only swards. White clover fixes atmospheric N through a symbiotic relationship with rhizobia bacteria in the soil. The bacteria infects the root hairs on the white clover plant, forming nodules. The plant supplies the bacteria with energy via photosynthesis and the bacteria fix N and make it available for white clover growth. Over time, provided there is enough clover in the sward, the fixed N will become available for grass growth as white clover leaves, stolons and roots decompose and release the N into the soil.

The content of white clover in a grassland sward tends to be greater in swards receiving no or low N fertiliser input (0-60 kg N/ha) compared to swards receiving 200- 250 kg N/ha. White clover can fix up to 200 kg N/ha, and sometimes more.

In grazed plots (grazed 8-10 times per year) containing high perennial ryegrass content with and without white clover at Teagasc Moorepark, grass-white clover swards receiving zero fertiliser N produced approx. 10.8 t DM/ha (range 8.3 – 13.3 t DM/ha) compared to grass-only swards receiving zero fertiliser N which produced approx. 8.2 t DM/ha (range 7.2 to 9.1 t DM/ha). Annual sward clover content in the grass-clover was 33%, and average crude protein content was 22% and digestibility 80%.

Grazing management is crucial to ensuring white clover persistence. Avoid allowing excessively high pre-grazing herbage masses to accumulate, graze swards at approx. 1,500 kg DM/ha and ensure swards are grazed to 4 cm sward height to allow light to the base of the sward for stolon production and hence white clover persistence.