

Title :

Resource-use efficiency in clover-based systems of dairy production

Abstract:

There has been widespread adoption of clover-based grassland in Ireland in recent years. Clover offers the opportunities to cut costs and greenhouse gas emissions from agriculture. There are three main objectives: (1) to determine differences in resource-use efficiency and greenhouse gas emissions from clover and non-clover based dairy farms; (2) to determine the extent of biological N₂ fixation and the extents of N₂O and N₂ emissions from clover-based grassland used for dairy production and (3) to determine the impact of cow-type and stocking density on the productivity of clover-based grassland. The first objective will be met by collecting a range of data on farms, including use of electricity, fuel oils, lubricants, synthetic fertilizers, concentrates etc. Resource use efficiency and greenhouse gas emissions will be determined using life-cycle assessment (LCA) methodology. The second objective will be achieved by an ¹⁵N tracing experiment tracking ¹⁵N uptake by pasture and gaseous emissions to the atmosphere. The ratio of N₂ to N₂O will be determined. The third objective will involve a systems-scale experiment at Solohead Research Farm with two types of cow: and Holstein Friesian (HF) and Jersey-cross (JX). There will be three stocking densities (cows per ha) of HF: 2.00, 2.25 and 2.50 and three stocking densities of JX: 2.25, 2.50 and 2.75. Along with measurement of milk solids production per ha and other standard production criteria, this experiment will examine the impact of treading damage on clover abundance and survival and productivity of clover-based grassland.

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