Grassland Science Department

Title

Classical and Genotypic methods of increasing grassland productivity through breeding

Abstract

Food Harvest 2020 anticipates that milk quota abolition will result in a 50% increase in total milk production, while improved technologies are expected to result in significant increases in the value of the beef (40%) and sheep sectors (20%). This project will focus on underpinning Ireland's competitive advantage in terms of low cost milk and meat production from grazed grass by 1) setting out new selection tools to achieve optimal breeding and evaluation in perennial ryegrass breeding, and 2) establishing a platform to enhance grass breeding progress and expertise through genomic selection.

In order to have clear grass breeding goals, grass breeders must have strong, direct links with agronomists, animal nutritionists and animal production research scientists. Such links are vital to ensure breeding objectives are in line with the requirements of grass based animal production systems. Recent research at Teagasc indicates that free leaf lamina, a sward structural characteristic, is an important component of grazed swards, resulting in increased DM intake by grazing livestock and improving the quality of the feed offered. This project will investigate the potential to introduce sward structural characteristics into grass breeding objectives. Cultivar persistency, longevity, and lifetime performance must be quantified to establish the effectiveness of breeding objectives in delivering highly productive, persistent grass cultivars. Investigation of the performance of cultivars and longevity in real commercial farm situations (>100 farms) will provide additional information on the effectiveness of breeding programmes in delivering highly productive persistent cultivars. Genomic selection has been used successfully in dairy cattle breeding in recent years; expertise from dairy cow geneticist will assist in exploring the potential for implementing genomic selection in the perennial ryegrass breeding in Ireland. The introduction genomic selection into perennial ryegrass breeding could potentially increase annual genetic gain by 50%, as this gain is additive it would be expected to achieve significant positive economic implications for the Irish ruminant sector.

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