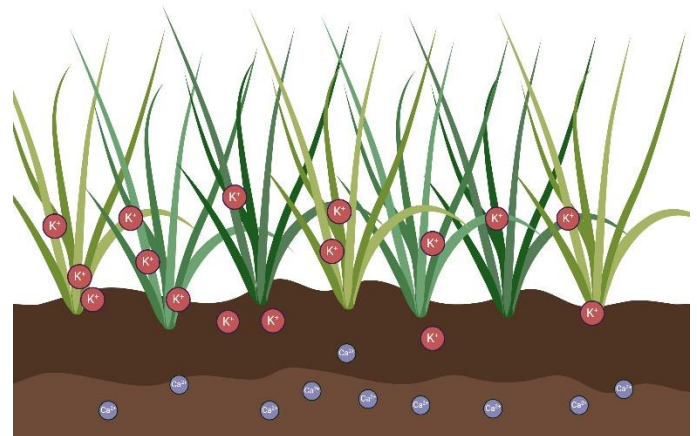


Best Wastes and Resources Management Presentation at Environ 2024

Winner Thomas McCarthy, Teagasc Johnstown Castle & South East Technological University Waterford.

Potassium (K) is an essential element in crop nutrition, involved in photosynthesis, Nitrogen metabolism, enzyme activation and water regulation. The sourcing of mineral fertilisers involves mining mineral-rich bedrock, a process along with secondary processing and transport which are carbon-intensive.

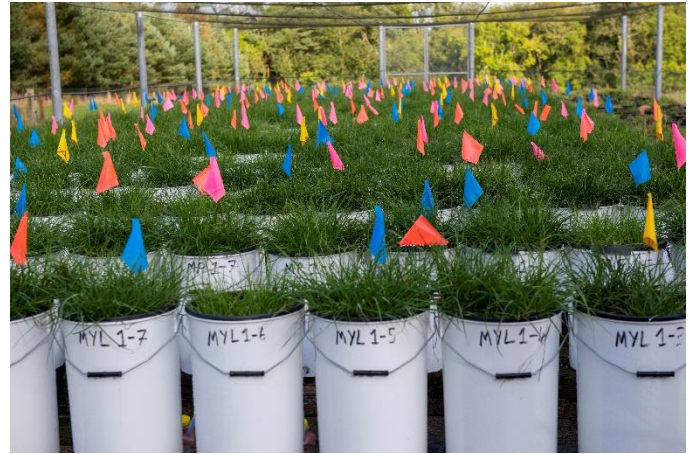


Some soils naturally supply large quantities of K to crops, often requiring less artificial fertiliser K per unit yield. In such soils, K fertility response to fertilisers is often low. On the other hand, sandier or ‘lighter textured’ soils have a lower ability to retain K and supply it to crops, and fertiliser K is more important on these soils. It can be relatively easy to build K fertility in these soils however over application of K fertilisers can result in losses via leaching. To improve the sustainable use of K fertilisers in crop production, it is important to determine the soil characteristics that regulate K.

This research evaluated the inherent soil physical and chemical characteristics of 22 Irish soils to ascertain their effect on soil K dynamics in an outdoor controlled-environment facility. Soils were

sown with perennial ryegrass and cut intensively for two years. A range of fertiliser K rates were used. Detailed measurements of sward dry matter (DM) production, herbage K offtakes, K losses in

leachate and changes in soil K fertility levels were measured. Soil cation exchange capacity (CEC) was a good indicator of the ability of a soil to retain fertiliser K to meet crop demand, reflected by increased yields and sward K uptake with increasing CEC. It also indicated susceptibility to leaching.



In conclusion, improved agronomic recommendations for K in grasslands through categorisation of soils based on CEC is an effective tool in improving K use efficiency and sustainable use of finite nutrient resources.