SUREROOT: Roots for The Future a Systematic Approach to Root Design

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What is SUREROOT?

‘SUREROOT’ (funded jointly by BBSRC and industry), which started in 2014, brings together two BBSRC National Capabilities, the North Wyke Farm Platform and the National Plant Phenomics Centre at IBERS. The project applies multidisciplinary approaches to evaluate new grass and clover varieties for their agricultural and environmental properties at farm, landscape and catchment scales.

Carbon capture (Small change = huge impact!)

Problem: The agricultural sector accounts for around 9% of total UK greenhouse gas emissions.

Potential: 65% UK agricultural land area is grassland.

Solution? Increase C storage in grassland subsoils using forage species including Festulolium hybrids with deep root architecture.

Initial findings: High Sugar Grass has more roots at depth (plus reduced enteric methane production = win:win)

More soil organic carbon in surface horizons (0 – 20 cm) under High Sugar Grass and Festulolium; clover increases soil organic carbon at 20 – 30 cm; no difference <30 cm.

Managing hydrology (Flood alleviation and drought tolerance)

Problem: Warmer summer temperatures and an increase in rainfall with more frequent high intensity events 3.

Potential: Many UK grasslands are in the wettest river catchments.

Solution? Slow down water movement through soils using large rooted Festulolium hybrids and clovers that structure soils.

Initial findings: Run-off least in permanent pasture, more from reseeds, greatest in Festulolium without clover. Effect of tillage dominant?

Festulolium runoff starts 6 days later than Permanent pasture field.

PP= Permanent pasture, LOP= High Sugar Grass Lolium perenne (Abermagic), FL= Festulolium cv. Prior, TRR= White clover Trifolium repens (AberHerald)