

North Wyke Farm Platform

Case study no. 9

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!)

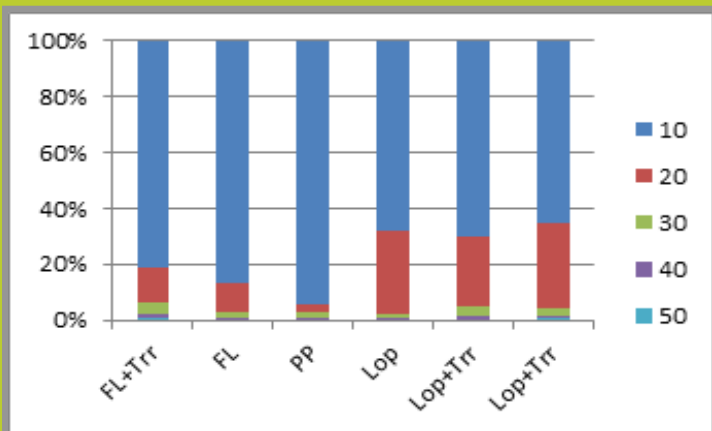
Problem: The agricultural sector accounts for around 9% of total UK greenhouse gas emissions.

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.



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

BBSRC and industry funded science developing improved rooting systems in grasses and clover for sustainable livestock systems and for ecosystem service



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 reseeded, greatest in *Festulolium* without clover. Effect of tillage dominant?

Festulolium runoff starts 6 days later than Permanent pasture field.

