

Nitrogen release from Cover Crops (NiCCs) project: Year one update

INTRODUCTION AND OBJECTIVES

- Cover crops are very effective at protecting soils over winter and reducing nitrate leaching losses to ground and surface waters, but the rotational and environmental impacts of nitrogen captured by cover crops is less well understood.
- Alternatives to glyphosate as a cover crop destruction technique are required, given uncertainties over its future use.
- The Nitrogen release from Cover Crops (NiCCs) project compares the legacy effects of two cover crop mixes with a stubble control treatment, destroyed by two different methods (glyphosate versus chopping or rolling on a frost).

RESULTS AND IMPLICATIONS

- At both sites, topsoil mineral N post-destruction was lower following mechanical compared to chemical (glyphosate) destruction (Fig. 1).
- A higher incidence of weeds was recorded in the spring barley crop at the West Sussex site, where mechanical destruction had been used on the stubble (wheat volunteers) and mix 1 (oil radish regrowth) treatments (Fig. 2).
- Spring barley yields were increased by up to 1 t/ha at the West Sussex site following the radish/phacelia cover crop, but only where it was destroyed using glyphosate. Mechanical destruction resulted in a 0.7-1 t/ha yield decrease (Fig. 3). Similar trends were observed at the Hertfordshire site, but spring oat yields were more variable due to high density of blackgrass.

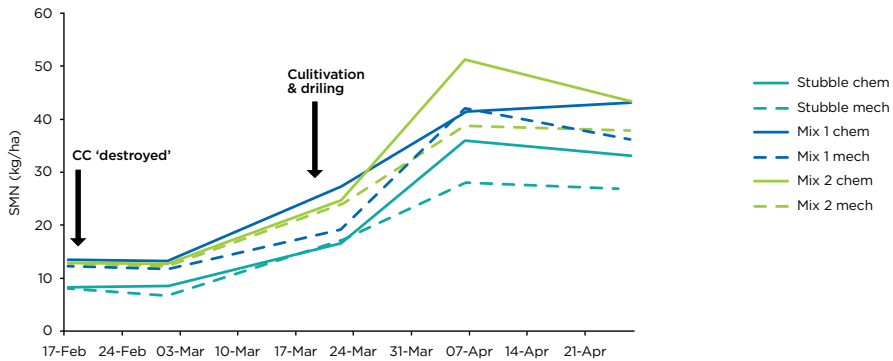


Fig 1. Topsoil mineral N following destruction (West Sussex)

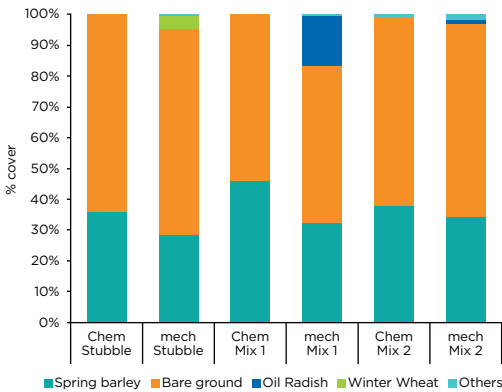


Fig 2. Ground cover, May 2022 (West Sussex)

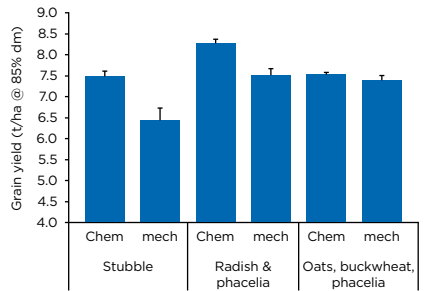


Fig 3. Spring barley yields, Harvest 2022 (West Sussex)

Mix 1: Phacelia (20%) and oil radish (80%)

Mix 2: Non-brassica mix: Japanese oats (45%), buckwheat (45%), phacelia (10%)

NEXT STEPS

- The legacy effect of these treatments on N leaching over the following winter and the yield of the subsequent oilseed rape crop (West Sussex) is the focus of ongoing work.

The work is funded by Affinity Water and Portsmouth Water, with the seed mixes kindly supplied by RAGT Seeds UK. This is a collaborative project, working very closely with our host farmers, who are conducting farm operations, ensuring the results are representative of commercial practice.



Affinity Water

FOR MORE INFORMATION PLEASE CONTACT:

Dr Anne Bhogal – Principal Soil Scientist, ADAS,
Email: anne.bhogal@adas.co.uk Phone: +44 (0)113 2843372

Dr Rachel Thorman – Senior Soil Scientist, ADAS
Email: rachel.thorman@adas.co.uk Phone: +44 (0)7896 690535

