



Nitrogen Release from Cover Crops [NiCCs] Project



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Objectives

The Nitrogen release from Cover Crops [NiCCs] project aims to quantify the impact of contrasting cover crop mixes and destruction methods on over winter nitrate leaching, soil nitrogen supply and the performance of the following two cash crops in the rotation

Methodology

Replicated [x3] plot experiments; cover crops drilled in August/September 2021 at 2 commercial arable farms in Hertfordshire & West Sussex

Legacy effects on soil mineral nitrogen post destruction and spring barley [West Sussex] and spring oats [Hertfordshire] yields measured at harvest 2022

Treatments

1. Control: Stubble & weedy cover
2. Mix 1: Phacelia [20%] and oil radish [80%]
3. Mix 2: Non-brassica mix: Japanese Oats [45%], Buckwheat [45%]; Phacelia [10%]

Cover crop destroyed 'mechanically' by either: **a**) chop & shallow incorporate [West Sussex] or **b**) rolling on a frost [Hertfordshire] and compared with chemical destruction using **c**) glyphosate



Results

At both sites, topsoil mineral nitrogen post destruction was lower following mechanical compared to chemical destruction [Fig 1]

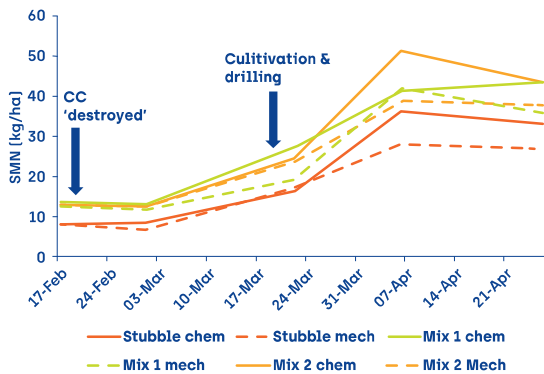


Figure 1. Topsoil mineral N following destruction (West Sussex)

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 and mix 1 treatments [Fig. 2].

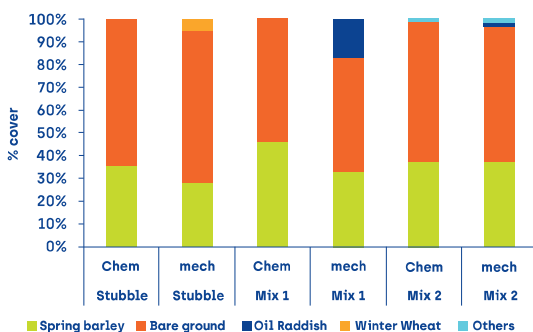


Figure 2. Ground cover [%] at the West Sussex site in May 2022

Spring barley yields were increased by up to 1 t/ha at the West Sussex site following mix 1, 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 with spring oats at the Hertfordshire site, but yields were more variable due to a high density of blackgrass.

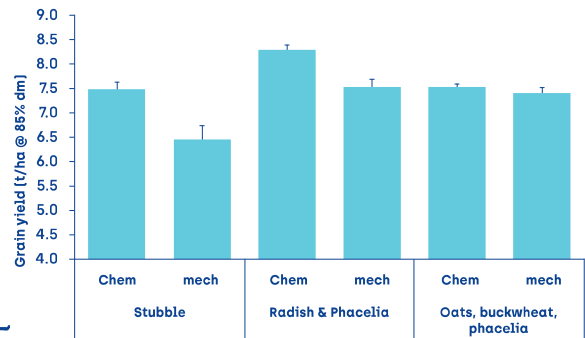


Figure 3: Spring barley yields, Harvest 2022 (West Sussex)

Next steps

The potential legacy effect of these treatments on nitrate leaching over winter 2022/23 has been measured [results pending]. At West Sussex the impact on the following oilseed rape crop will be determined at harvest 2023.

Results will be used to underpin advice for growers on the appropriate management of cover crops, to maximise N recovery and minimise nitrate leaching

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