

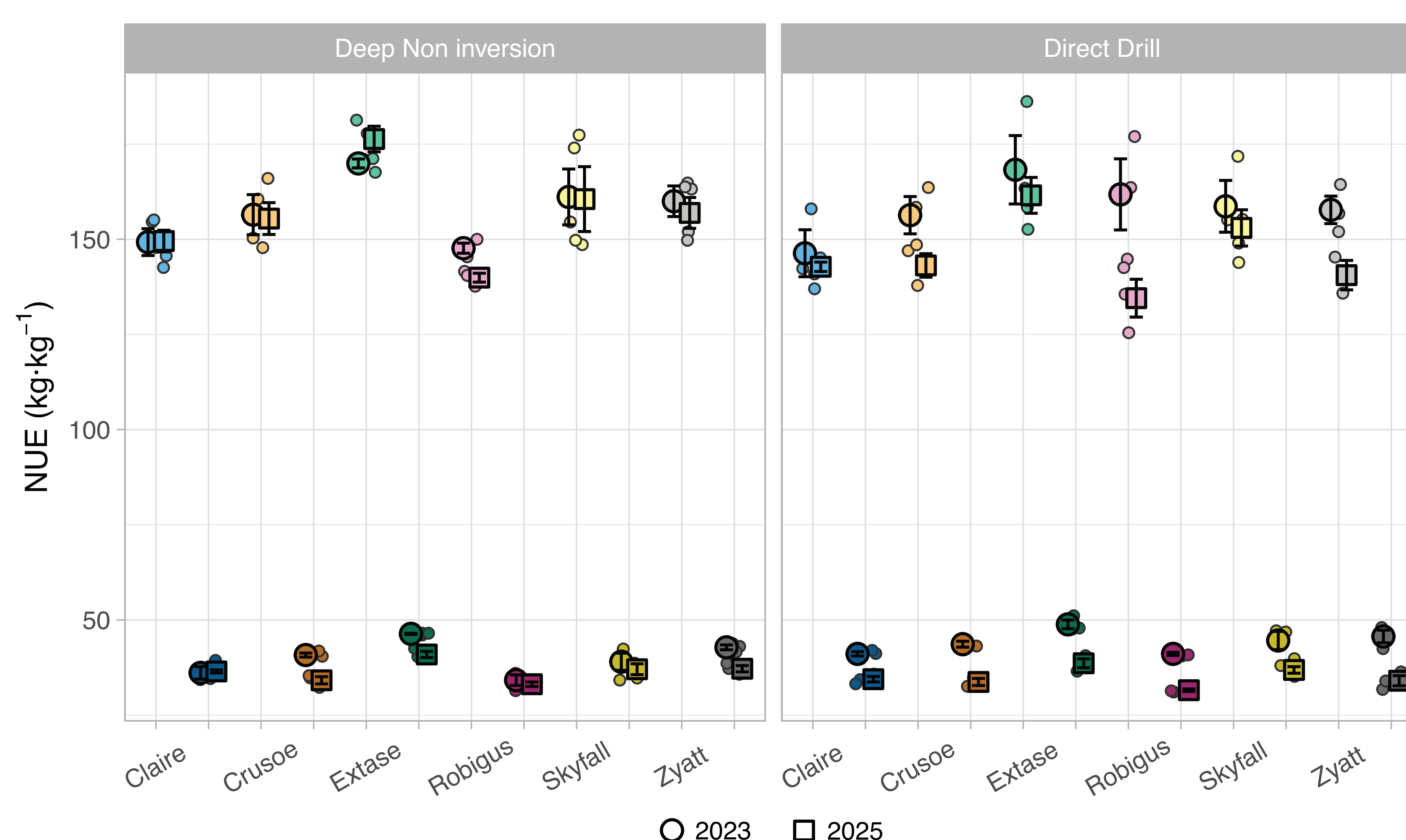
EXPLOITING NOVEL WHEAT GENOTYPES FOR REGENERATIVE AGRICULTURE

As farmers are increasingly adopting agronomic practices aligned with regenerative agriculture principles, it is important to understand which varieties are performing well under these conditions and which traits are relevant. In a project funded by The Morley Agricultural Foundation and the JC Mann Trust, Niab evaluated three current and three former commercial winter wheat varieties as well as eight pre-breeding lines (these are derivatives of Niab's diversity enriched wheat lines) under two contrasting tillage approaches: deep non-inversion and a long-term direct drill (established for nine years at the start).

Trials were conducted in two contrasting years (harvest 2023 and 2025) and included two nitrogen rates: low nitrogen (50 kg N/ha) of ammonium nitrate or 220 kg/ha as standard. The crop was monitored throughout the season, both on the ground and using remote sensing images.

The two seasons of yield data (2023 and 2025) shows significant differences amongst commercial varieties and how the nitrogen rate affected variety performance.

Overall, the nitrogen use efficiency, calculated as the ratio of yield produced to the available nitrogen (N applied as ammonium nitrate and N available in the soil at the start of the season) resulted in much lower NUE at 220 kg/ha than at 50 kg/ha, and tended to be lower in 2025.



Nitrogen use efficiency (NUE) for Childerley field trials where six commercial wheat varieties were tested under two tillages and two nitrogen levels (50 and 220 kg N/ha). Each colour denotes a distinct variety; lighter tones indicate measurements from the 50 kg N, whereas darker tones represent data from the 220 kg N treatment



Aerial drone image of trial