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Farm location: Nottinghamshire

Trial type: N rate

Variety: Gleam

Soil type: Medium

This trial was part of the AICC Crop Nutrition Club 2022, which has been run in conjunction with the Farm-PEP project led by ADAS. This report contains the results of a winter wheat trial testing the effect of a reduced N rate.

	Farm standard	Trial
15 Mar	60 kg N/ha	60 kg N/ha
13 Apr	80 kg N/ha	50 kg N/ha
03 May	40 kg N/ha	20 kg N/ha
Total N rate	220 kg N/ha	170 kg N/ha



Satellite imagery

NDVI (normalized difference vegetation index) is a spectral reflectance index which shows a combination of canopy size and greenness, on a scale from 0 to 1. NDVI images were sourced from www.datafarming.com.au, based on freely available 10m resolution data from the Sentinel 2 satellites. The scale varies between images but always runs from red (low) through orange, yellow and green to blue (high). The availability of imagery is constrained by the need for cloudless conditions.

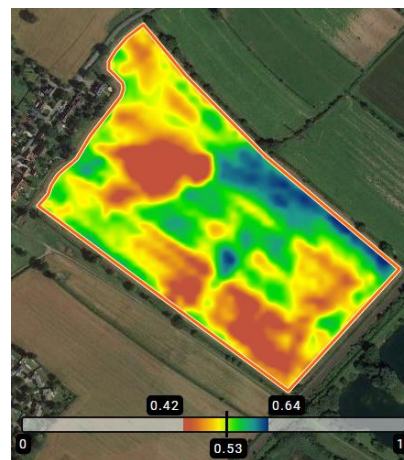
Prior to the second N application, the field was fairly even, as shown by the narrow NDVI range; the variation which was present ran mainly across the tramlines so should not have biased the N rate comparison. After the second application, the reduced N rate began to show slightly lower NDVI than the surrounding crop. This difference became more pronounced as the crop senesced in July.



NDVI before 2nd application (17 Mar)



NDVI before 3rd application (24 Apr)



NDVI pre-harvest (10 Jul)

Yield and gross margin results

The average measured yield of the standard N treatment was **13.24 t/ha**, according to yield monitor data. This may be slightly higher than the true average as taken from a trial strip, excluding headlands.

Reducing the N rate by 50 kg/ha decreased yield by **0.64 t/ha** relative to the standard N rate. This difference is large enough that even without replication, we consider it likely that the difference was due to treatments rather than to underlying variation.

Using a wheat price of £270/t and ammonium nitrate fertiliser at £700/t, this gives a £71/ha reduction in gross margin from cutting the N rate. However, the prices of wheat and fertiliser continue to fluctuate; the latest AHDB fertiliser price is £870/t for AN, while feed wheat has fallen below £260/t, and at these prices, the reduction in gross margin is only £40/ha.

Future trials

Greater confidence in the yield effect of altering the N rate could be achieved by replicating the treatments within the field and measuring the yield from each replicate strip. Alternatively, if a combine harvester with yield mapping is available in future seasons, good precision can be achieved using the ADAS Agronomics analysis of the yield map data.

The trial field was well chosen; in any future trials, seek to use similarly even fields, or fields where the variation runs across the tramlines to affect all treatment equally.