

We could increase profitability by understanding how much nitrogen fertiliser modern winter barley varieties require and when to apply it. Sarah Henly finds out more from researcher Helen Holmes



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Trial results showed a 0.5t/ha yield increase from applying more than 50% N before early stem extension in barley.

■ If you haven't yet applied any nitrogen fertiliser to your winter barley, prepare to go in later this month with a bigger share of the total than previous years to gain up to 0.5t/ha extra yield.

And in all likelihood, you will need to increase total N too, says Helen Holmes of Adas.

There is new evidence to suggest you are missing out if you still calculate your N rates using Defra's *RB209* fertiliser manual or indeed use the same rate as you did for Maris Otter and Halcyon.

Newer varieties, be they for feed or malting, two-row, six-row or hybrid, are generally hungrier and respond well to higher rates, she explains.

Recent trials are confirming suggestions from historic records that consistently cost-effective responses are achieved using an extra 27kg N/ha for each extra tonne of potential yield when growing varieties typically yielding 8t/ha or more. Up to 210kg N/ha was appropriate for the index 0 soils with low mineral N in the trial.

Furthermore, yields were even better last season, when at least two-thirds of the total N was applied at

tillering and the remainder at stem extension rather than one-quarter or one-third at tillering with the rest following at stem extension (GS30) or ear at 1cm (GS31), she says.

"Our results showed a 0.5t/ha yield increase from applying more than 50% N before early stem extension compared with less than 30% N as recommended in *RB209*.

"Another year of trials data is needed to clarify the situation, but the early results are encouraging."

The reason is simply because there is a strong relationship in barley between grain number and final yield, she explains. The key is to increase tillering to maximise crucial early light interception between emergence and grain set.

As regards quality, last season the earlier N strategy was found to reduce grain N on average by 0.1%

which was inconsistent with the previous year. The malting varieties Venture and Maris Otter were included.

It is possible that using earlier N could offset the effect of applying higher rates on grain N%. Typically, increasing rates by 20-30kg N/ha increased grain N% by about 0.1%.

Dr Holmes is keen to see another season's result to confirm this satisfies the lower nitrogen specifications associated with the malting market.

Autumn N application – the trials tested 30kg N/ha at drilling – didn't pay, possibly because the soil had some residues and the mild autumn led to mineralisation, she says.

"Each site and crop should be assessed before planning a nitrogen fertiliser programme. It is critical you look at a local area map and conform to nitrate-vulnerable zone rules. There is often a limit to how flexible you can be," she warns.

There's another caveat. Where larger and earlier applications are made, growers must pay extra attention to lodging prevention and disease control.

Selecting appropriate plant growth regulators and not just relying on chlormequat alone is important, she stresses. Net blotch could also pose a greater threat, she adds.

By next spring, there will be new N management advice and hopefully *RB209* will have been rewritten for

winter barley. Meanwhile, Dr Holmes would encourage the uptake of these interim results – to go in earlier with more N fertiliser – to optimise returns this spring.

## Advance barley yields with early fertiliser applications

### Research reasons

This work should clarify the requirements for nitrogen (N) fertiliser in feed and malting winter barley and give growers confidence in applying appropriate N rates at optimum timings.

**Project** Improving guidelines for N management in winter barley  
**Timescale** August 2013-February 2017

**Researchers involved** Adas  
**Funders** AHDB, CF Fertilisers UK and Syngenta

**Cost** AHDB levy funding of £150,000 plus in-kind contributions from CF Fertilisers UK and Syngenta

### Key points

- Where yield potential exceeds 8t/ha, an extra 27kg N/ha for every extra 1t/ha may prove beneficial
- Applying up to two-thirds of the total N fertiliser earlier than stem extension is optimal in newer varieties

### AHDB perspective by Sajjad Awan

Research and knowledge transfer manager

■ "The *RB209* fertiliser manual has not been updated for winter barley for about 30 years, leading to an estimated £25m/year loss in profit through inadequate nitrogen management.

"This project is reviewing existing evidence and generating new trials data to update the manual. Growers will have detailed advice on both quantity and timing of N applications in a range of barley types for different markets."

