

The grain %N rule

- The Fertiliser Manual (formerly RB 209) states that:

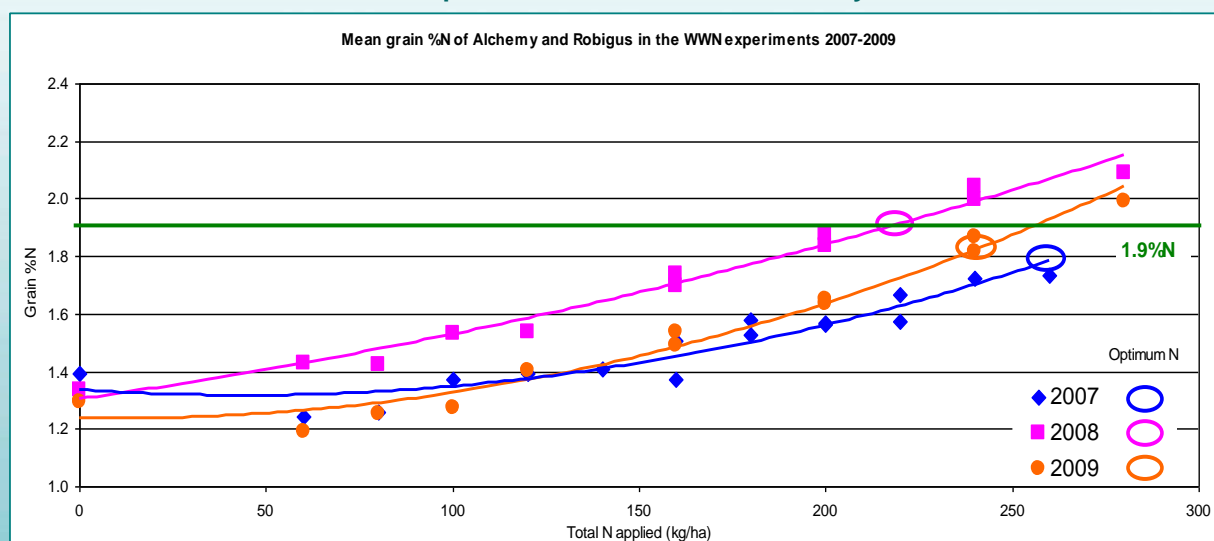
Grain %N at the economic optimum rate of nitrogen is about 1.9% N (100% dry matter basis) for feed wheat and 2.1% N for breadmaking wheat. Where concentrations in yields from a number of adjacent fields are consistently above or below these values during several years, nitrogen fertiliser application rates should be adjusted down or up by 30 kg N/ha per 0.1% difference in grain %N.

- The HGCA Nitrogen for winter wheat – management guidelines (2009) state that:

'Grain protein (nitrogen) with optimum N for yield in feed varieties is consistently about 11% (1.9%N)'

How applicable is the grain %N rule to winter wheat in NI?

Figure 1 Grain %N in winter wheat in experiments at AFBI Crossnacreevy 2007-2009



Results:

Grain %N increased in response to fertiliser N applied

Grain %N did not begin to 'level off' at higher N rates

Grain %N at optimum N varied around 1.8 – 1.9% in the three years

Conclusions:

- Winter wheat crops in Northern Ireland use nitrogen very efficiently in producing yield - therefore they are good at (temporarily) sequestering carbon
- Grain %N can be used to check the efficiency of fertiliser N use by winter wheat crops in NI:
 - Where grain %N is consistently **high** e.g. $\geq 2.0\%$ during several years, fertiliser N use should be **reduced**, as not all the fertiliser N is being used by the crop to produce yield and so is being stored in the grain
 - Where grain %N is consistently **low** e.g. $\leq 1.8\%$ during several years, fertiliser use could be **increased**, as the crop needs, and can use, additional N to produce more yield (and profit)

Resources:

Fertiliser Manual (formerly RB209)

Nitrogen for winter wheat – management guidelines HGCA, Autumn 2009

CAFRE Crop Nutrient Recommendation Calculator is one of the Farm Nutrient Calculators on the online services at www.ruralni.gov.uk