FREE

Grain Nutrition Benchmarking

- *Soil analysis* tells you about soil availability of nutrients for your crops,

- *Leaf analysis* tells you whether uptake of nutrients is sufficient at one point in time,

- *Grain analysis* should tell you whether your crops got enough of each nutrient throughout the whole season (as well as nutrient offtakes);

- *Together* these should all tell you about the success of your crop nutrition strategy, whether due to soil health, crop rooting, or whatever.

Thus far, grain analysis has been under-utilised on UK farms so, through the YEN, ADAS is organising a new FREE **YEN Grain Nutrition Benchmarking** survey, sponsored by AHDB & Yara, to explore the value of Grain Analysis for UK arable farms. The GNB survey is open to all farms who can provide field-specific samples of any cereal crop harvested in 2017, and (if we get insufficient samples) then from harvest 2018.

What you need to do:
1. Work out how many samples you can provide; ideally two to six samples per farm, with a good contrast in growing conditions e.g. different soil, soil P Index, or yield. However, single samples are OK, and multiple samples may be possible.
2. Email yen@adas.co.uk, telling us the number of samples you can provide.
3. Fill in a form (which we will send) with farm & field details (e.g. soil Indices and yield)
4. Send grain samples to Yara, in the labelled bags which we will send you.

What you will get:
In spring 2018, we will send you a one page report for each sample you enter, with the results for your sample compared with the other results from the survey, using the following bar chart for each nutrient:
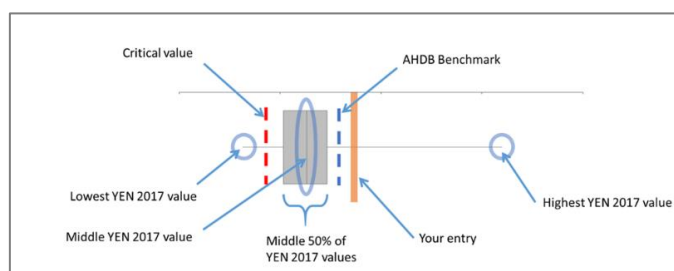
We are most interested in grain P, but we will analyse for all essential nutrients (other than Molybdenum) i.e. N, P, K, Ca, Mg, S, Mn, Cu, Zn, Fe & B. An example (fictitious) report is shown over-leaf, but note your report will also include nitrogen.

For queries please contact yen@adas.co.uk

Or ring Jane Stead at ADAS Gleadthorpe: 01623 848332

Grain **N**utrition **B**enchmarking

Grain P, mg/kg (axis: 2000, 2500, 3000, 3500, 4000, 4500)

Recent AHDB research has shown grain P analysis can provide a useful check on whether a field is providing sufficient phosphorus. Values of less than 3,200 mg/kg indicate a need for further checks on P nutrition.

Grain K, mg/kg (axis: 2500, 3000, 3500, 4000, 4500, 5000, 5500)

RB209 assumes a standard value of 5,500 mg/kg potassium (K) in grain. Values less than 3,800 indicate a need for further checks on K nutrition, especially by soil analysis (page 9).

Grain Ca, mg/kg (axis: 200, 300, 400, 500, 600, 700, 800, 900, 1000)

Plant calcium (Ca) levels tend to reflect adequacy of moisture supplies. However, almost all the plant's calcium remains in the straw at harvest. Low grain Ca is <250 mg/kg, but we don't yet know if this relates to water stress.

Grain Mg, mg/kg (axis: 600, 700, 800, 900, 1000, 1100, 1200)

Literature shows low magnesium (Mg) values in grain are <800 mg/kg. With further experience, grain Mg levels may provide a useful double check on soil levels and crop symptoms.

Grain S, mg/kg (axis: 900, 1100, 1300, 1500, 1700)

Grain sulphur (S) is important for storage protein formation, especially the glutenins. Sulphur is required in proportion to grain protein formation, hence in proportion to N uptake.

N:S, ratio (axis: 11, 13, 15, 17, 19, 21)

The higher the N:S ratio, greater than about 17, the more likely the crop is to have suffered from sulphur deficiency.

Grain Mn, mg/kg (axis: 10, 20, 30, 40, 50, 60)

Literature shows low manganese (Mn) values in grain are <20 mg/kg. Further experience will show whether lower values indicate crops that were deficient.

Grain Cu, mg/kg (axis: 2, 3, 4, 5, 6, 7, 8)

Grain copper (Cu) less than 2.5 mg/kg indicates possible deficiency.

Grain Zn, mg/kg (axis: 10, 20, 30, 40, 50)

Zinc (Zn) values below 20 mg/kg are low, but whether these should be regarded as limiting is uncertain. Literature shows grain zinc is increased by nitrogen availability;

Grain Fe, mg/kg (axis: 20, 30, 40, 50, 60, 70, 80, 90)

Whilst grain iron (Fe) may prove useful with further experience, we currently have no guidelines for its interpretation.

Grain B, mg/kg (axis: 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0)

Grain boron (B) values this year are all larger than values last year. Grain analysis may not be a useful way of assessing boron sufficiency.