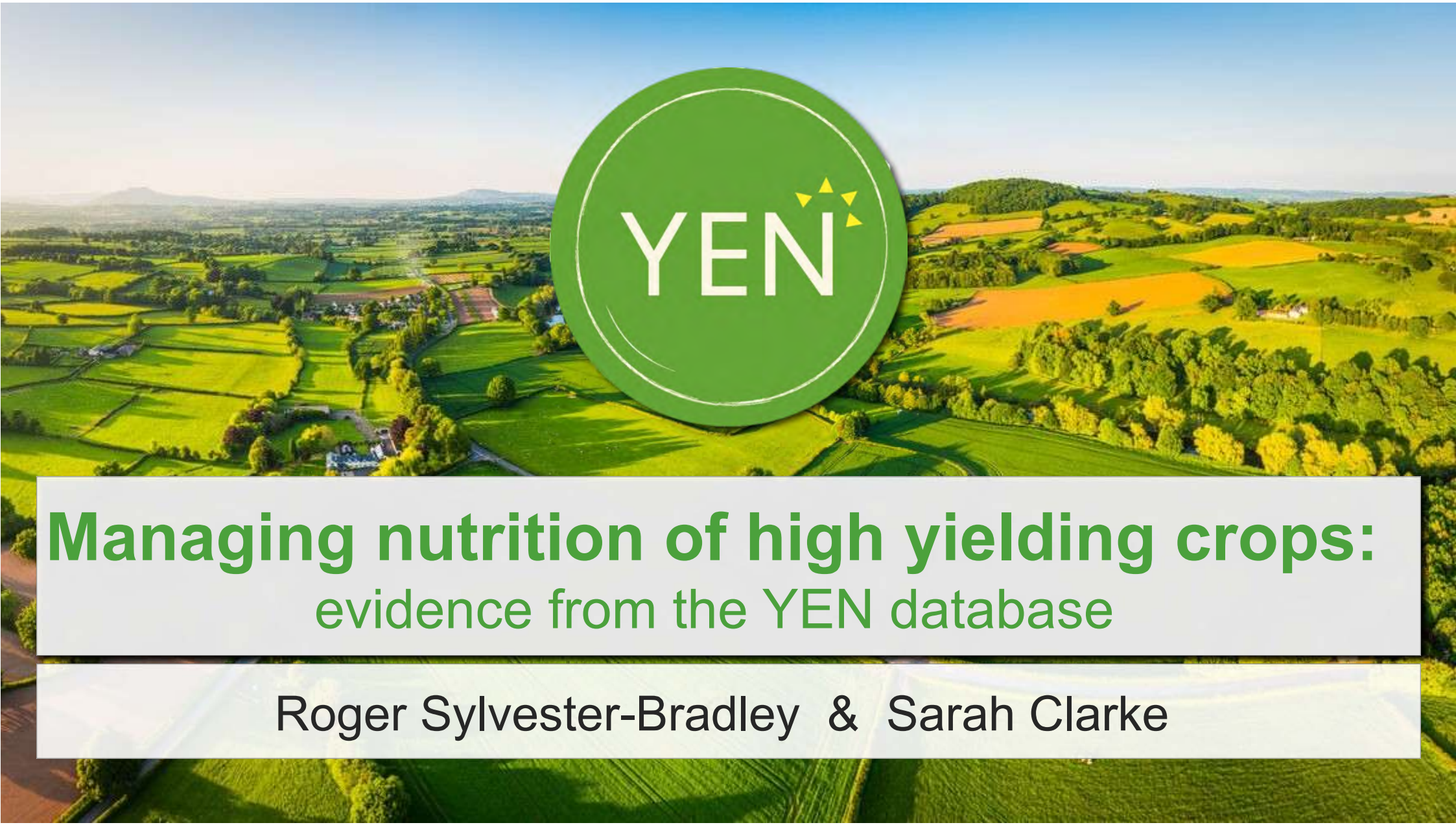
Cereals Session

Chair: Andrew Clune, BASF



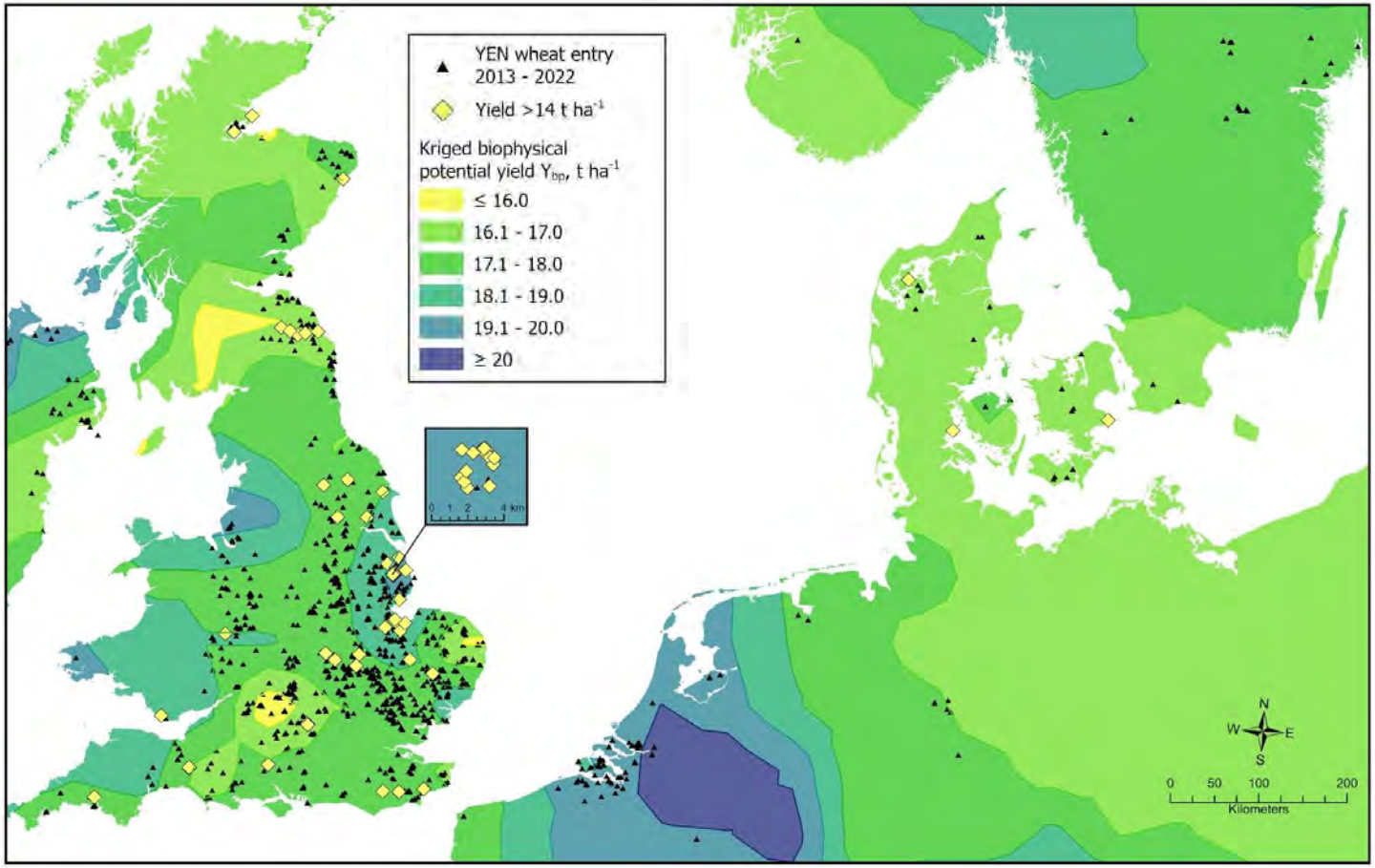
Managing nutrition of high yielding crops:
evidence from the YEN database

Roger Sylvester-Bradley & Sarah Clarke

On-farm Measuring … Sharing … Learning

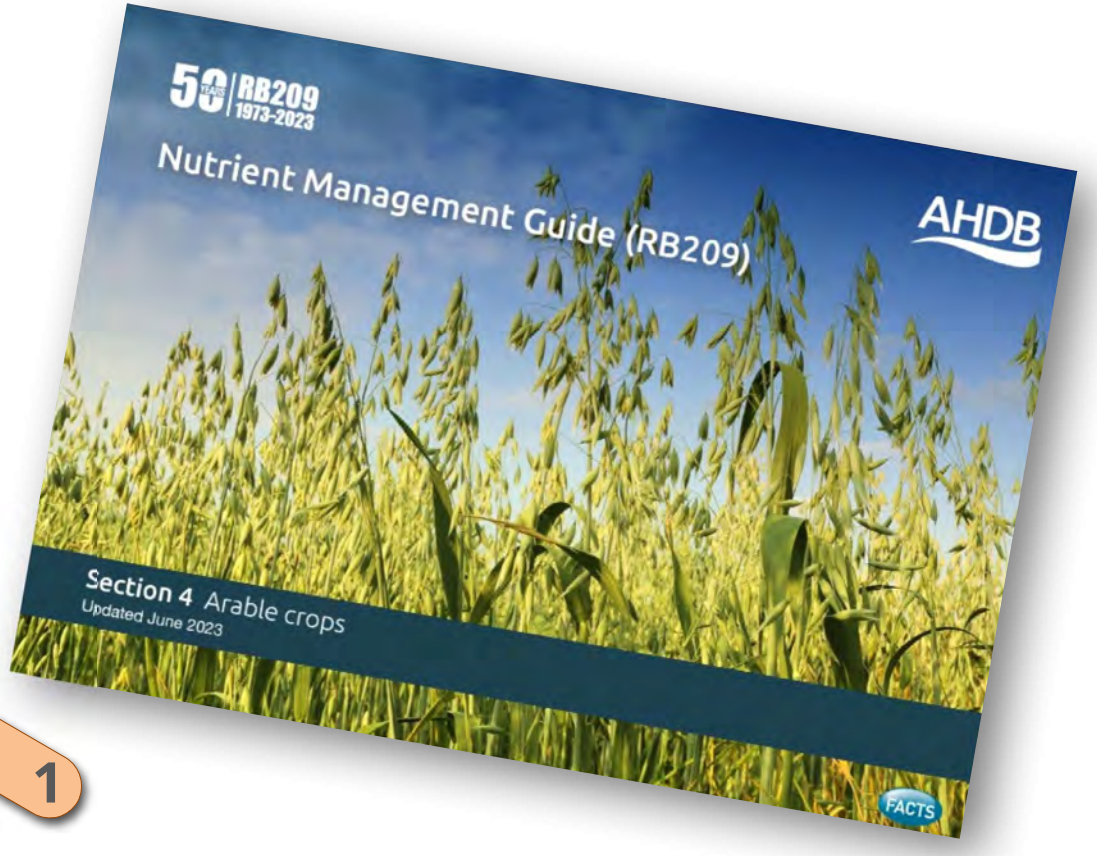

NUTRI-CHECK NET
OPTIMISING CROP NUTRITION
On Farm Measuring ... Sharing ... Learning
3
Review
Crop
Nutrition
Manage
ment
Check
& Adjust?
2
Plan
1

Wheat YEN database 2013 – 2022



- >1,100 yields: 5 – 19 t/ha
- >400 metrics …
  - Location & Weather
  - Variety (RL data)
  - Previous crops
  - **Manures & Fertilisers**
  - Soil texture, stones, depth, analysis
  - Cultivations
  - Sowing & Growth stages
  - Ag. Chems
  - Crop problems noted
  - Grab & grain sample analyses (physical & chemical)
  - Potential yield
  - **Nutrient efficiencies**
  - Gross Margin
  - Carbon (GHG) intensity

Nutrition Management Step 1. Planning



YEN

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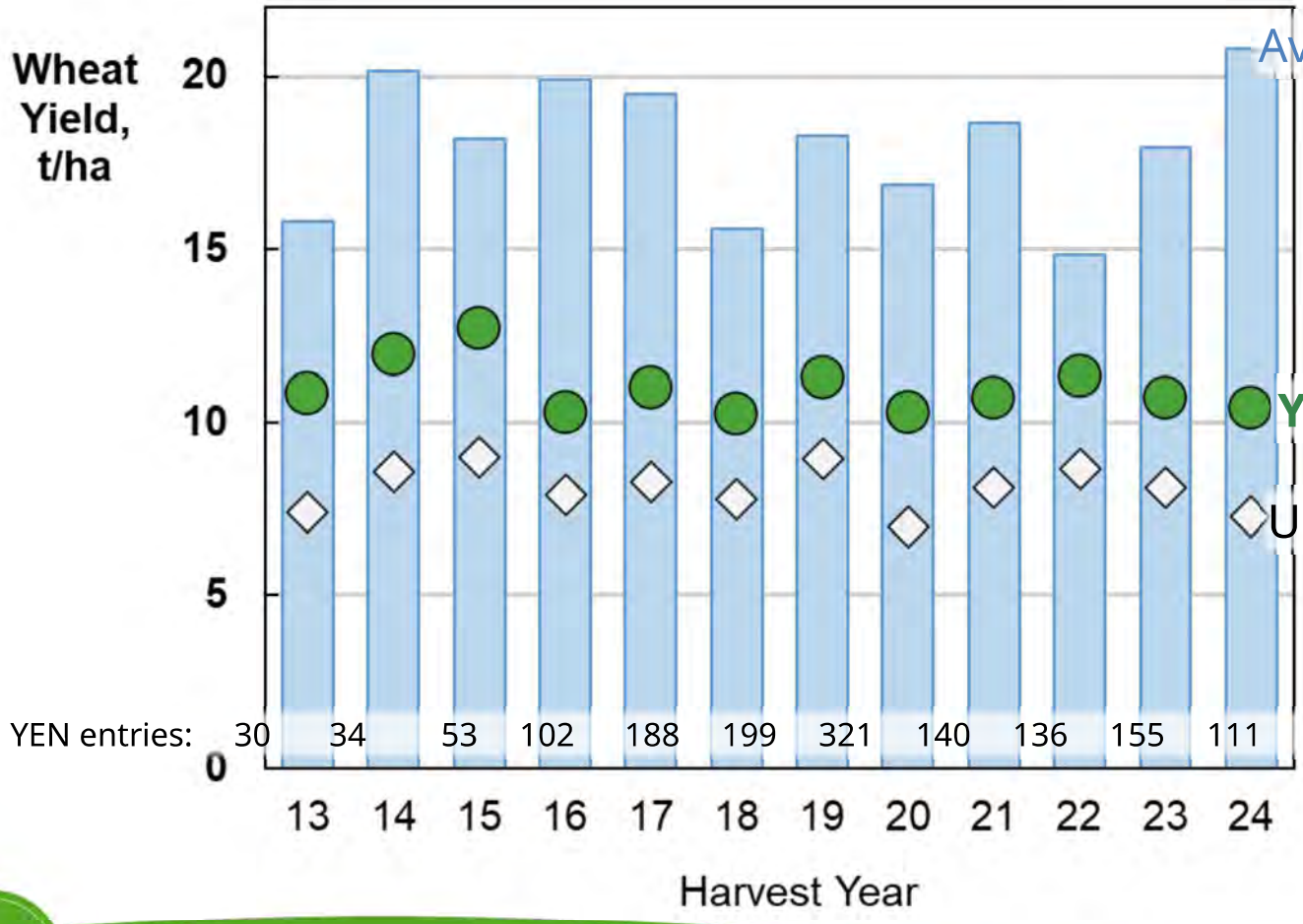
What most influences the plans for N & S? Please select all that apply.

ⓘ Start presenting to display the poll results on this slide.

YEN wheat yields

Why are they not increasing?



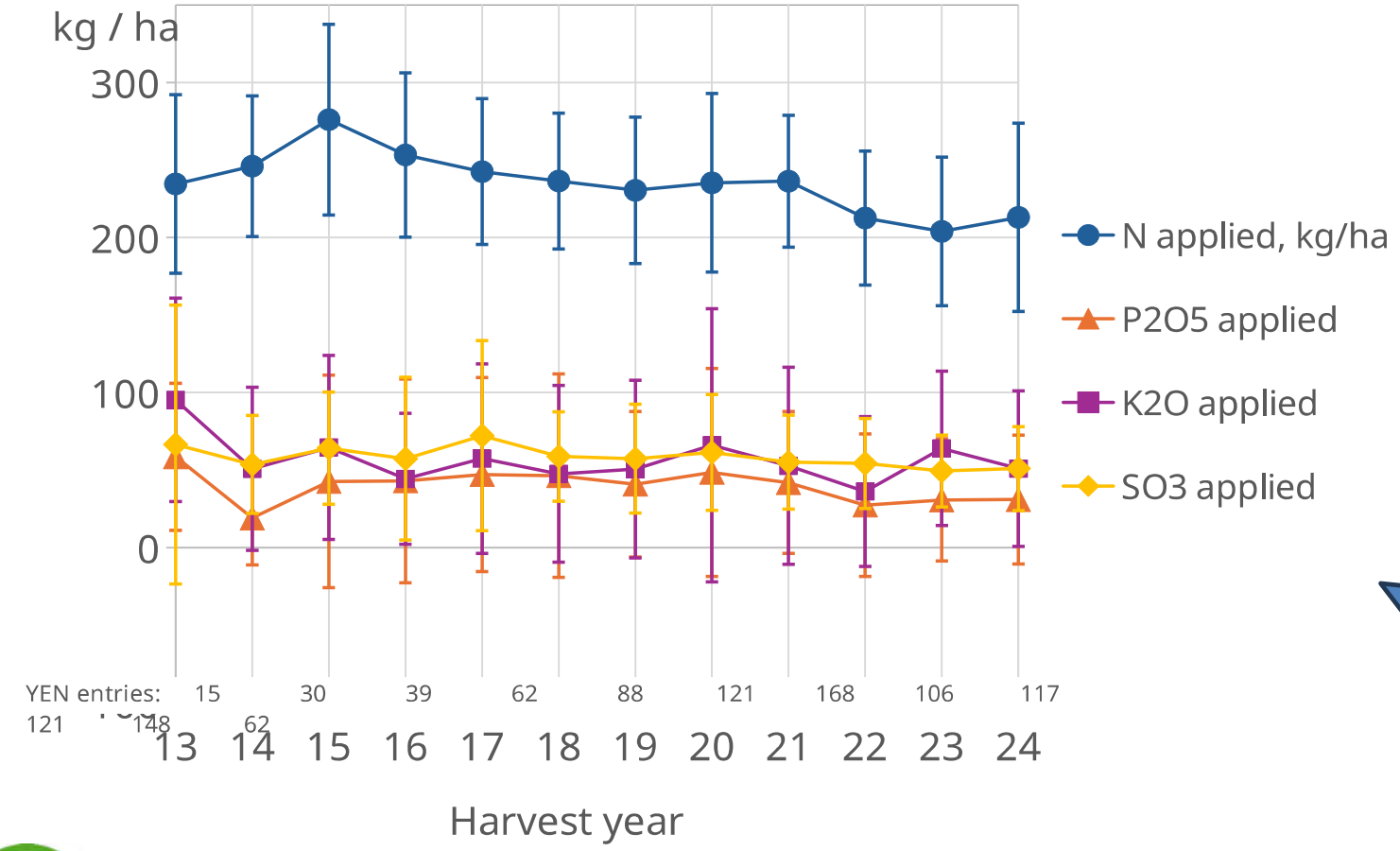
Average Biophysical Potential

enabled by the Met Office

YEN average

UK farm average

YEN average nutrition trends



Has nutrient use become too small for higher yields ?

Planning – YEN database findings

- Yield & nutrition have big **'FARM FACTORs'**

Higher yielding YEN wheat crops …

- Have more N & SO_3 applied
- AND more frequent N applications
- AND produce *more grain per kg N* applied

Higher yields tend to be grown on fields …

- With soil P Index up to 3
- Recently receiving organic manures.


Lamyman Worlaby Farms, June 2014

Step 2. Checking & Adjusting


Lamyman Worlaby Farms, June 2014

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How do you check whether a current nutrition plan is being successful?

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Do you / Should farms use lab. tissue / sap tests and, if so, when?

ⓘ Start presenting to display the poll results on this slide.

Crop appearance & structure

For high yields, cereal crops need –

- High ear numbers & High biomass
  … so, lots of shoots in spring

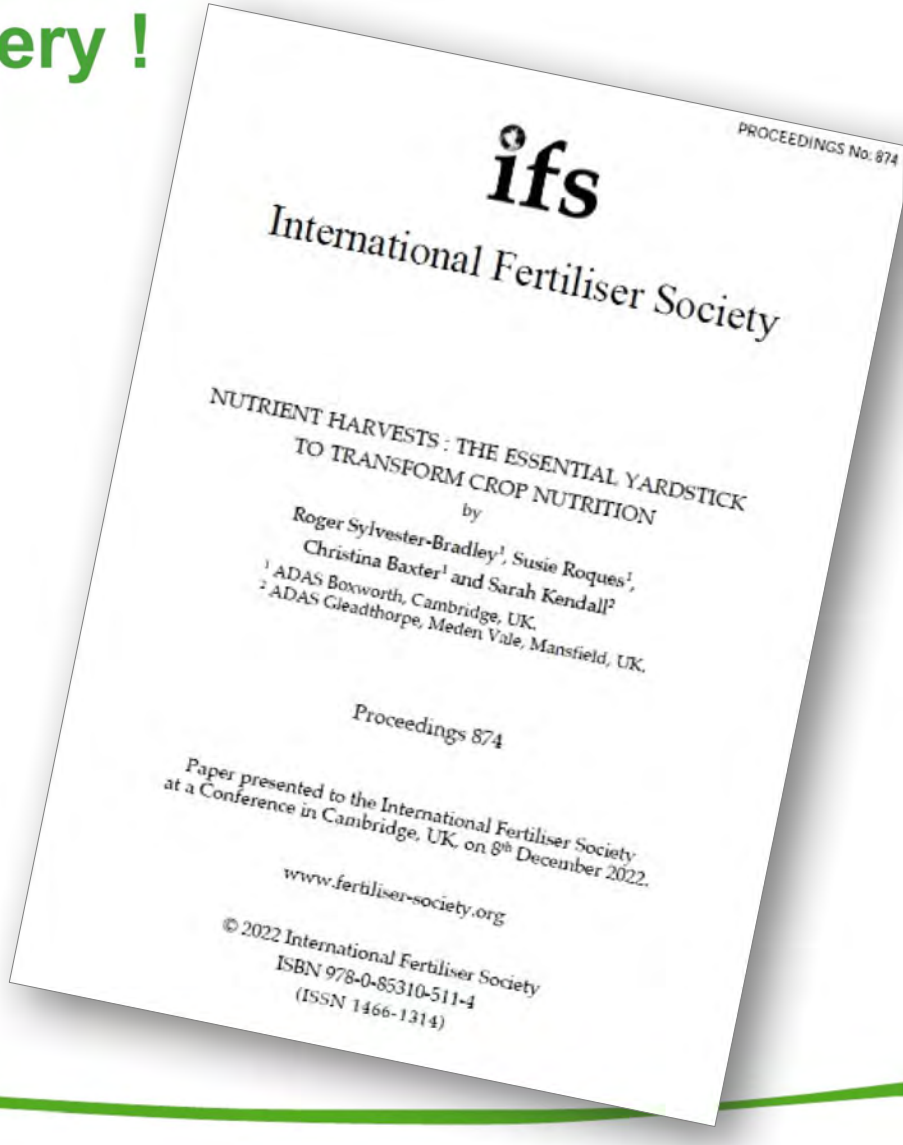
- Uninhibited & Prolonged Photosynthesis …
  1. During Crop Construction
     = Shoot number / Canopy size & colour
     = No deficient nutrients … Leaf analysis ?
  2. During Production growth
     = Green leaf longevity ≈ nutrient status at GS59
     = Prolonged water & nutrient capture via …
     = Deep rooting (>2 metres) – by measuring biomass.

Leaf analysis – Qs & As

- How variable are leaf nutrient levels ?
  - ❖ **YEN reports show lots of variation**
- Does leaf analysis foretell future nutritional status?
  - ❖ **YEN data say NO!**
- How should farms use leaf analysis? … routinely?
  - ❖ **YEN data say best for immediate diagnosis**
- Do we have useful Critical levels ?
  - ❖ **YEN ToCs can substitute for critical values**
- Can we correct crop nutrient status ?
  - ❖ **It is worth checking … With v. Without ...**

ToC = "Threshold of Concern"
= YEN low quartile
= bottom of middle half of values

Step 3. Reviewing … a YEN discovery !



PROCEEDINGS No: 874

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International Fertiliser Society

NUTRIENT HARVESTS : THE ESSENTIAL YARDSTICK TO TRANSFORM CROP NUTRITION

by

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YEN

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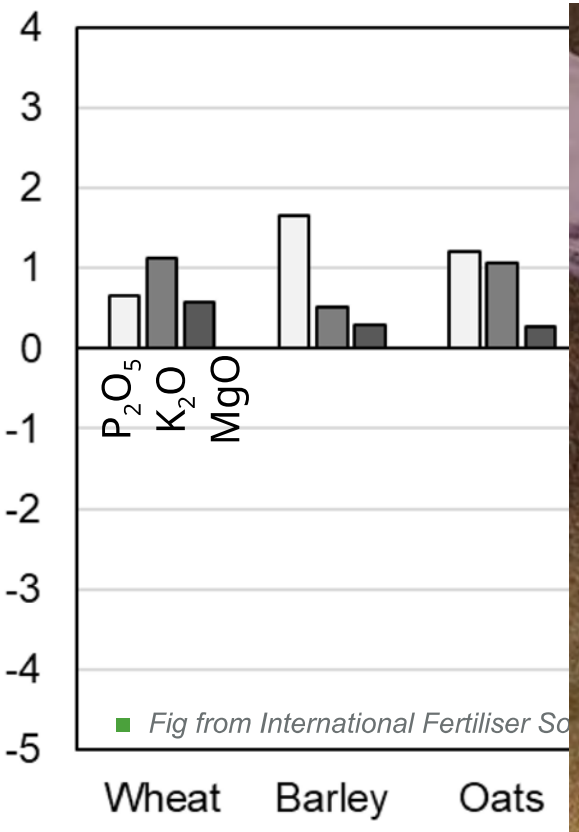
Which 1 or 2 measures are most telling about the success of your (or any) farm's past nutrition strategy?

ⓘ Start presenting to display the poll results on this slide.

Step 3. Reviewing … Value of harvest analysis?
YEN data show that *it pays to measure* Nutrient Offtakes

Difference:
Standard Assumption*
minus YEN average

kg / tonne
moist grain

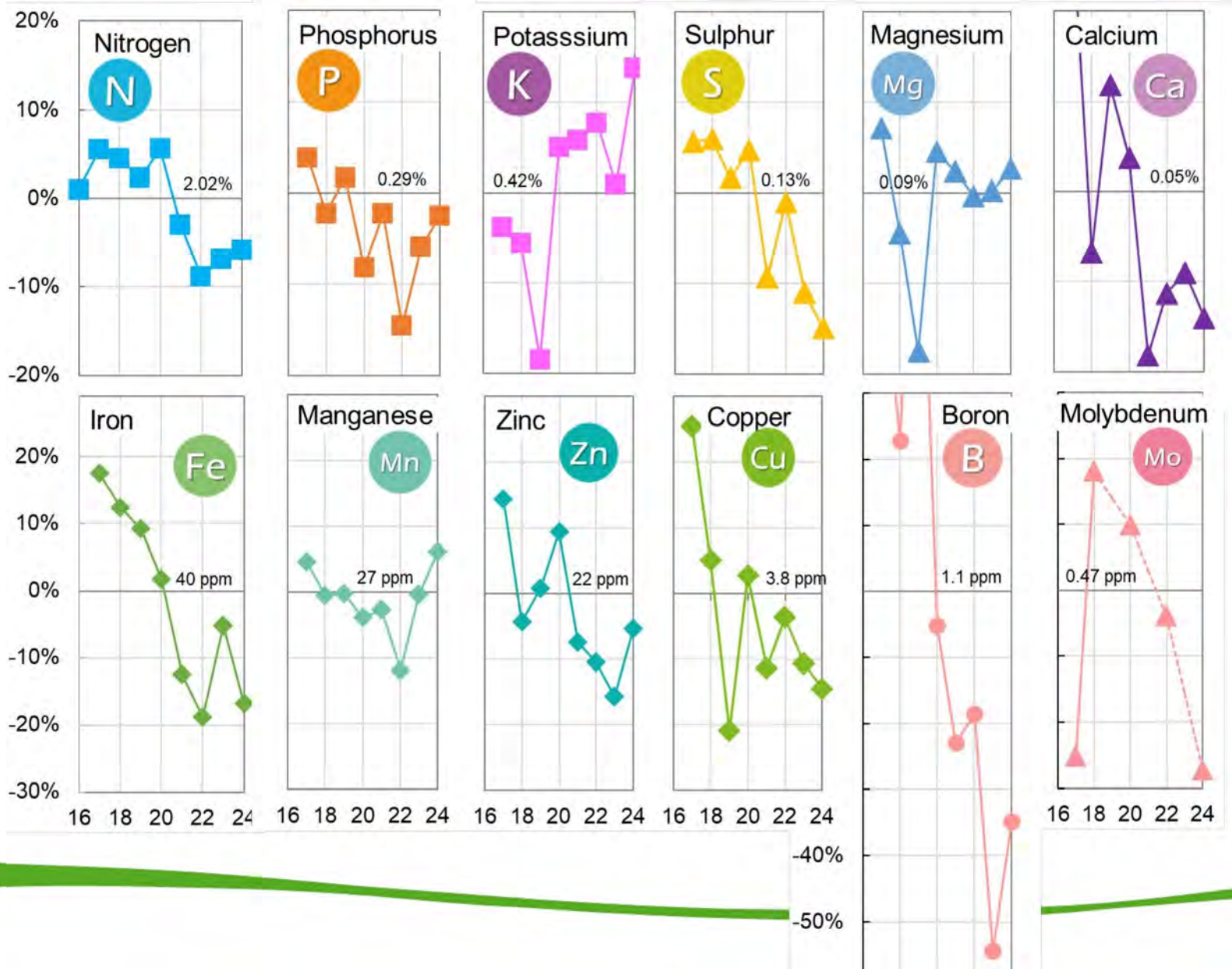


* from: RB209 (AHDB, 2022) &
www.pda.org.uk/pda_leaflets/nutrients-in-crop-material

YEN trends in Grain Nutrient concentrations:

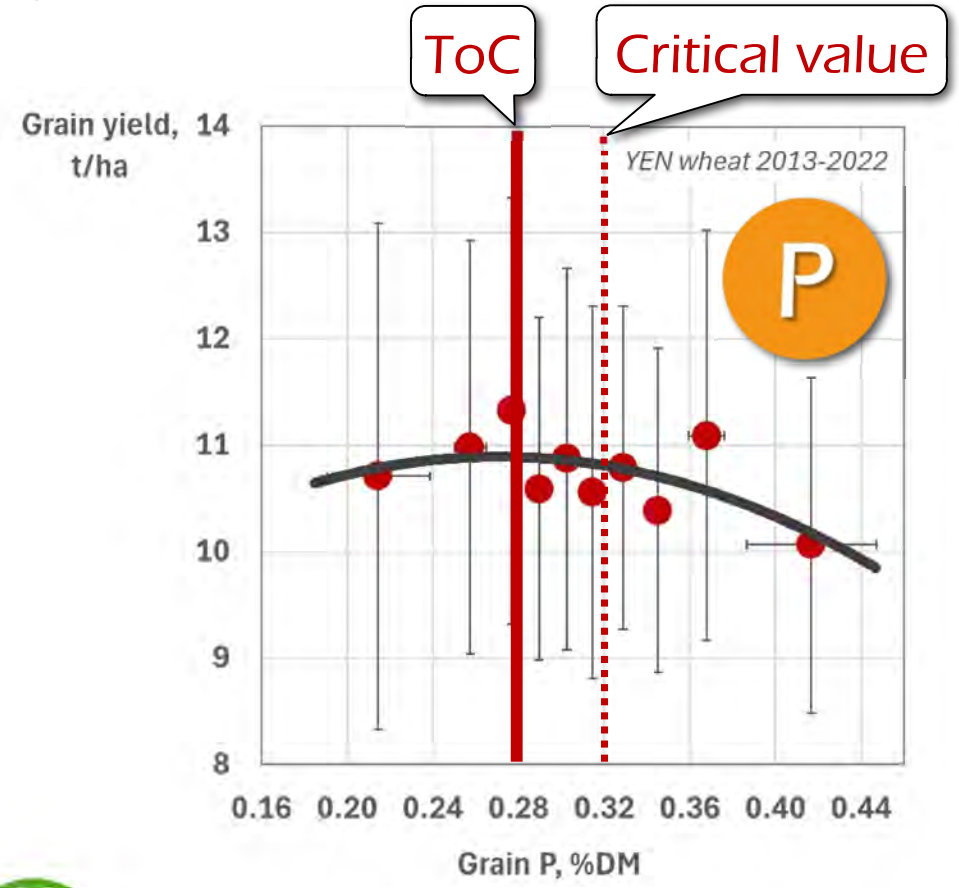
Wheat 2016 – 2024

Changes from Long Term Average



Grain Nutrient % & YEN yields ?

– yield patterns show the value of ToCs



YEN grain Nutrient Concentrations

– yield patterns show the value of ToCs

N

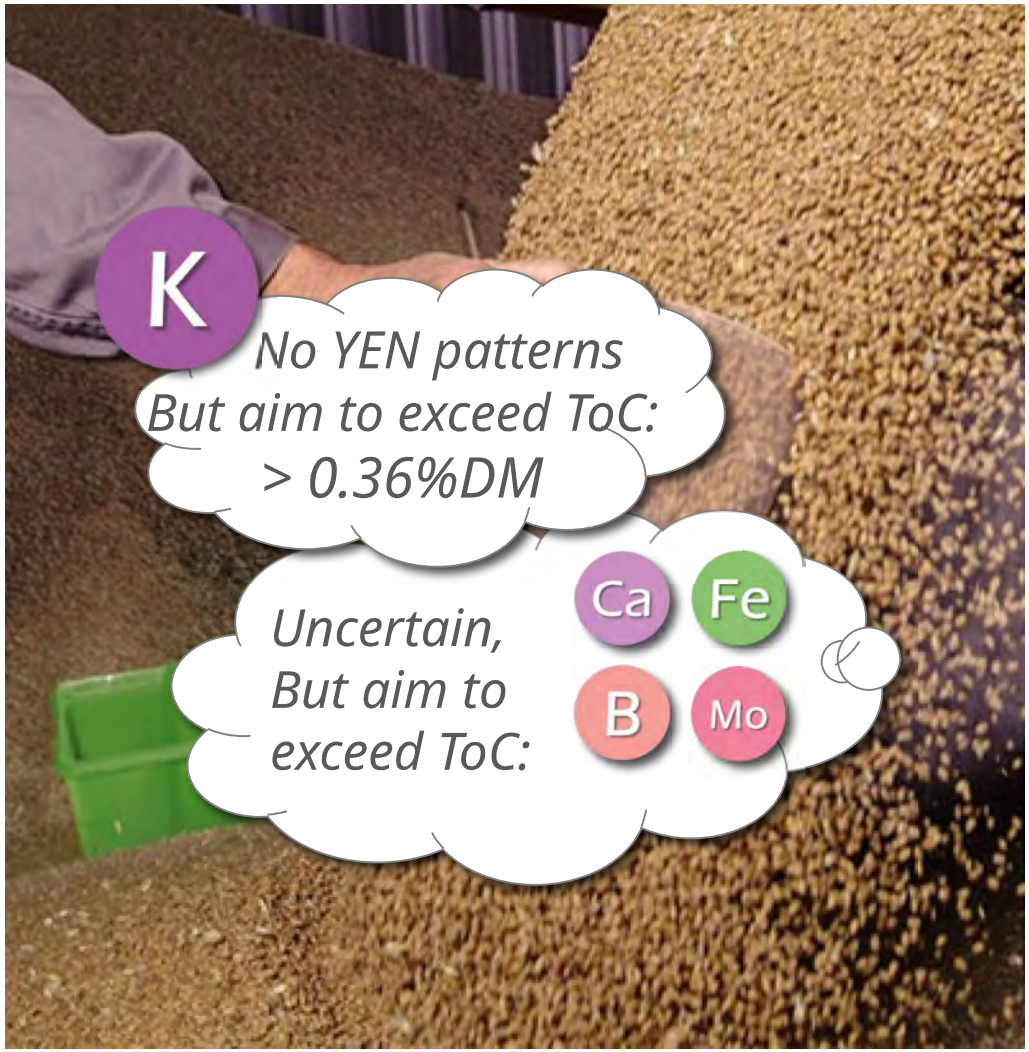
Good evidence to aim for variety's AHDB RL protein %

P

YEN evidence to aim to exceed ToC: > 0.28%DM

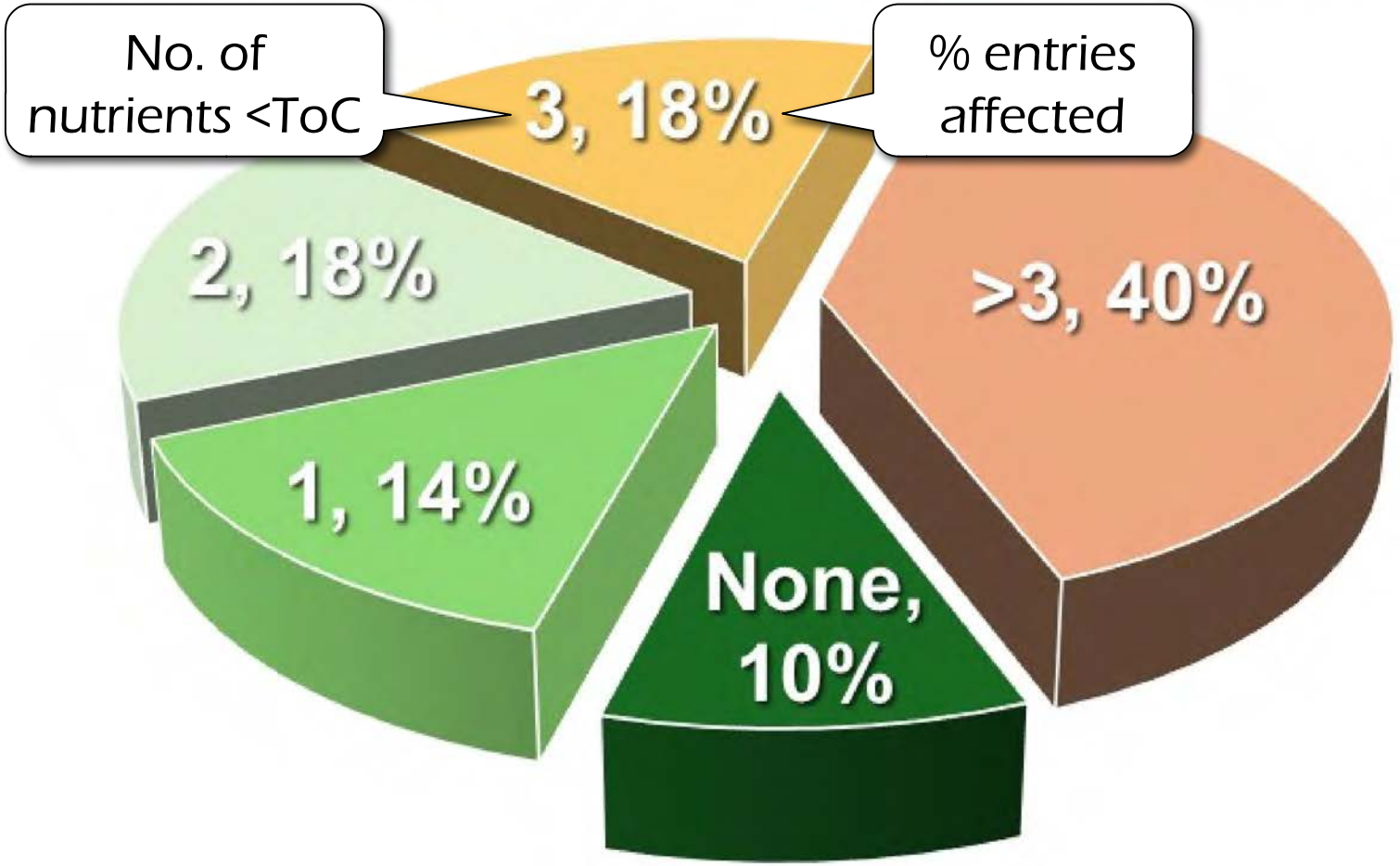
Good evidence, aim to exceed ToC:

S Mg Mn Zn Cu



YEN

Frequencies of low nutrient %s (<ToC) in YEN wheat 2013 – 2022



Nutrition for high yields: Summary

- Crop structure & colour are most crucial – in spring – & in summer
- Leaf analyses provide ‘snap-shot’ checks
- Worth checking efficiencies of ‘adjustments’

- It pays to measure Grain Nutrients on each field, each year
- Aim to exceed all YEN ToCs

- Adjust field-by-field plans according to recent crop nutrient reviews
- Flexible farm stocks will often be necessary for good N, S & micronutrient management

Thank you

YEN