

# Saltburn Monitor Farm Meeting Report

## Micronutrients

17 January 2019

Guisborough Rugby Club

For more information, visit: [cereals.ahdb.org.uk/saltburn](http://cereals.ahdb.org.uk/saltburn)



## Meeting Summary – Key Messages

- Managing plant micronutrients, along with wider agronomic and farming practices, enables healthy plants to reach their yield potential.
- Look at history of nutrient deficiency and pH levels on-farm and consider whether soil sampling or tissue analysis is the best way to test for deficiency.
- Consider trying tramline trials on your farm to test for yield responses to treatments.

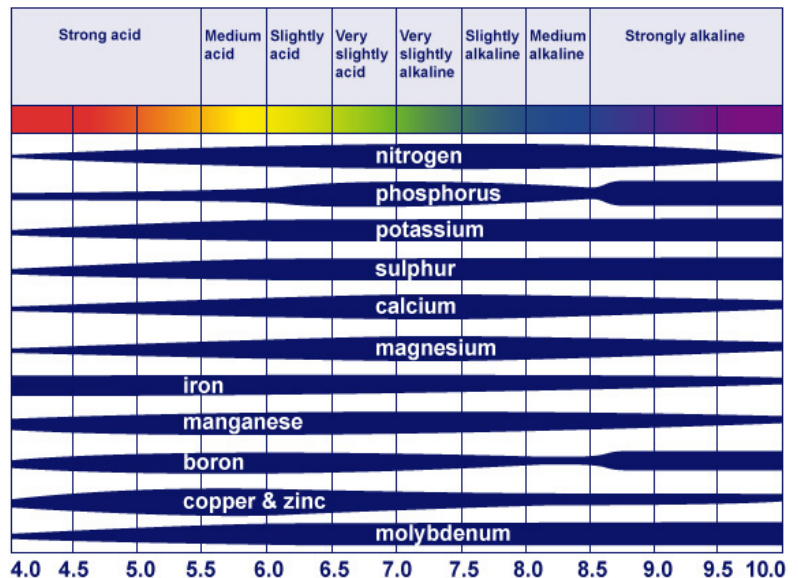
## Micronutrients

Sarah Kendall, ADAS






A balance of micronutrients is important for optimum plant growth. Healthy plants depend on effective management of all areas, including good soil structure and nutrient management.

The risk situations for micronutrient deficiencies depend on crop type, soil type and pH. The table shows the availability of micronutrients with pH.

Trials work looking at the response of crops to micronutrients is limited, but research has shown that 10% of OSR crops responded to boron with responses seen in cereals too. Responses are often found with copper (on soils with <1.0 mg/kg Cu) and manganese (soils with pH >7 and if tissue analysis is <20 mg/kg Mn) and a small yield response by using molybdenum in certain situations. Yield responses in UK cereals were not expected by the use of zinc.



Micronutrients are used in different ways in the plant – the key micronutrients and their deficiency symptoms can be seen below:

| Micronutrient              | Manganese  | Copper   | Zinc  | Boron  | Molybdenum  |
|----------------------------|--|--|---|--|---|
| <b>Role in the plant</b>   | Activates enzymes involved in protein synthesis, lipid metabolism and photosynthesis   | Essential component of proteins involved in metabolic pathways; important for production of viable pollen in grain production; role in maintaining cell wall structure | Component of enzymes involved in photosynthesis, sugar formation and protein synthesis.   | Controls metabolic processes; structural component of cell walls; affects cell division  | Required for the function of enzymes involved in redox processes  |
| <b>Deficiency Symptoms</b> |  <p>Cereals: grey flecking/striping; pale and limp leaves</p> <p>OSR: yellowing and mottling; symptoms first on middle leaves, then spread to older leaves</p> |  <p>Cereals: Pale, twisted leaves; stunted plants; blind grain sites</p>             |  <p>Cereals: Pale stripes; affected tissue dies and turns pale brown</p> |  <p>OSR: Dieback of apical growing point; young leaves small/puckered; brittle tissue; stem cracking; poor flowering</p> |  <p>OSR: reduced leaf area, pale, limp leaves</p> |

In order to diagnose micronutrient deficiencies, this can be done in three ways: visual symptoms, soil analysis or tissue analysis.

This table highlights the currently known ways of determining a risk of deficiency via soil or tissue analysis.

|            | Crop affected | Soil risk factors  | Soil analysis    | Tissue analysis  |
|------------|---------------|--|------------------|------------------|
| Boron      | OSR           | Sandy, High OM<br>pH >7                                      | Yes<br><0.8 mg/l | Yes<br><20 mg/kg |
| Copper     | Cereals       | Sandy, peat, Shallow chalk, High OM                          | Yes<br><1.0 mg/l | No               |
| Manganese  | Cereals & OSR | pH >7.5, sandy >6.5<br>Organic/peat pH >6<br>Fluffy seed bed | No               | Yes<br><20 mg/kg |
| Molybdenum | OSR           | pH < 6.5   | Yes<br><0.1 mg/l | ?                |
| Zinc       | Cereals       | Sandy soils with high pH and P index                         | Yes<br><1.5 mg/l | Yes<br><15mg/kg  |

### Tissue analysis sampling

- Early in season at stem extension  
Sample of at least 25 points (2–3 plants per point)
- Systematic sampling – W pattern
- Sample youngest fully expanded leaf
- Take several leaves/sample
- Ensure no soil contamination, dry leaves
- Avoid sampling leaves with evidence of disease/pest damage

Once sampling has been completed there are two options depending on when the deficiency is detected. If soil analysis confirms the deficiency, correction can be made through liming, seed treatments, seedbed fertilisers or autumn applications, if possible. If tissue analysis confirms a deficiency, foliar applied fertilisers is the best way to correct the deficiency.

## CHAP and CropMonitor

*Richard Glass and Judith Turner*

CHAP (Crop Health and Protection) is one of the four Agri-Tech centres and has the aim of facilitating industry research, speeding up the development and adoption of new technologies, targeting sustainable intensification and promoting collaboration across the UK research base.

The main areas through CHAP currently include centres developing research and innovations on: emerging pesticide resistance, biopesticide development, soil management, integrated pest management (IPM) programmes and new plant protection product developments.

CropMonitor, developed by Fera, has been designed to provide local growth stage information, along with current pest and disease risk based on weather data, with a decision tool to inform spray applications. More information is available at: <http://www.cropmonitor.co.uk/>



## Find out more... AHDB Information and Research Links

[Nutrient research](#)

[Nutrient management guide \(RB209\)](#)

[Micronutrients for cereals and oilseed rape](#)

## Further Information

For details about the Saltburn Monitor Farm and past meeting information, please visit: [cereals.ahdb.org.uk/saltburn](http://cereals.ahdb.org.uk/saltburn)

### Contact Details

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