SOUTHERN
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VETCH

SECTION 9

NUTRITION

KEY POINTS | NUTRITION

In-crop management – nutrition

Key points

- In-crop nutrient requirements are generally minimal unless nodulation fails
- Rhizobia nodules need to be pink to be effective
- Use leaf tissue testing, especially for micronutrients if deficiency is suspected

FEEDBACK

MORE INFORMATION

A paper on 'Maximising the fixed nitrogen benefits of pulses' was delivered by SARDI's Ross Ballard and the University of Adelaide's Maarten Ryder at the southern region GRDC Updates held in February 2017, https://grdc.com.au/resources-and-publications/grdc-update-papers

An app with crop nutrient deficiency photos is at http://www.ipni.net/ndapp

GRDC Micronutrients Fact Sheet http://www.grdc.com.au/GRDC-FS-CropNutrition-Micronutrients

A GroundCover™ TV episode on legume nodulation sampling is at https://grdc.com.au/Media-Centre/GroundCover-TV/2015/09/Episode-17-September-2015/bfnBsEM64t0

Inoculating legumes: a practical guide is at https://grdc.com.au/resources-and-publications/all-publications/bookshop/2015/07/inoculating-legumes

GRDC Nitrogen fixation Fact Sheet https://grdc.com.au/GRDC-FS-NFixation-Legumes

9.1 Nutrition

In-crop applications of macro nutrients are rarely required in vetch. The main reason for nitrogen application would be if nodulation failure occurred.

In relation to micronutrients, manganese may be required for vetch on highly alkaline soils or under fluffy soil conditions. Foliar applications of iron may be needed for vetch grown on highly alkaline and wet soils. Vetch may respond to molybdenum in acidic soils that are deficient.

Use leaf tissue testing to assess nutrient requirements, especially for micronutrients, preferably before deficiency symptoms appear (see Table 1 and Figure 1).

9.1.1 Nodulation failure

If plants have failed to form sufficient active nodules, insufficient nitrogen will be fixed by the crop. If soil-available nitrogen is low the crop may be nitrogen-deficient.

Description

Plants become yellow or pale green with restricted growth, especially during cold, wet periods through the seedling stages. Oldest leaves are the worst affected. There are few or no nodules on the roots or nodules lack red pigmentation inside.

Plants can appear normal until flowering on soils with moderate to high nitrogen levels when they become pale green. Older leaves are affected most and first.

Management

As a salvage operation, apply nitrogen (N) to the affected crop with N fertiliser, if economic.

Ensure future crops are adequately inoculated with viable Group E or F inoculum.

When assessing the effectiveness of nodulation, the more nodules and the earlier the infection (i.e. on the tap and crown roots) the better. Nodules need to be pink to be effective.

Photo 1: *Vetch roots showing an adequate level of nodulation for good nitrogen fixation. Vetch can fix between 50 and 150 kg N/ha depending on end use. No differences in nitrogen fixation have been recorded between vetch varieties. Nitrogen fixation is directly correlated to biomass production.*

Photo: Emma Leonard, AgriKnowHow

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Table 1: A guide to nutrient deficiency symptoms.

Symptom	Old to middle leaves						Middle to new leaves					New leaves to terminal shoots					
Deficiency	**N**	**P**	**S**	**K**	**Mg**	**Zn**	**N**	**Mg**	**Mn**	**Zn**	**B**	**Mn**	**Fe**	**Zn**	**Cu**	**Ca**	**B**
Chlorosis																	
Complete	x		x									x#	x				x#
Mottled	x	x	x		x					x	x						
Interveinal					x						x						
On margins			x		x												
Necrosis																	
Complete		x				x											
Distinct areas (including spotting)				x		x		x	x		x	x		x			
Margins													x			x	
Tips				x		x			x			x		x	x		
Pigmentation within necrotic or chlorotic areas																	
Purple	x	x	x	x		x		x	x	x		x				x	
Dark green		x									x						
Brown		x	x						x		x	x	x	x			
Red					x						x			x			
Malformation of leaflets																	
Rolling in of margin				x				x					x			x	x
Wilting		x													x		
Twisting									x			x			x		x
Malformation of leaves																	
Cupping	x						x								x		
Umbrella formation								x			x						
Malformation of stems and roots																	
Internode shortening											x			x			x
Petiole collapse																x	
Root distortion											x		x			x	x

Source: PIRSA/GRDC (2010) Vetch: the Ute Guide. PIRSA/GRDC – https://grdc.com.au/vetch-the-ute-guide
Original source – Symptoms of Nutrient Disorders – Faba Bean & Field Pea, Snowball and Robson (1991), University of Western Australia. # = mild

FEEDBACK

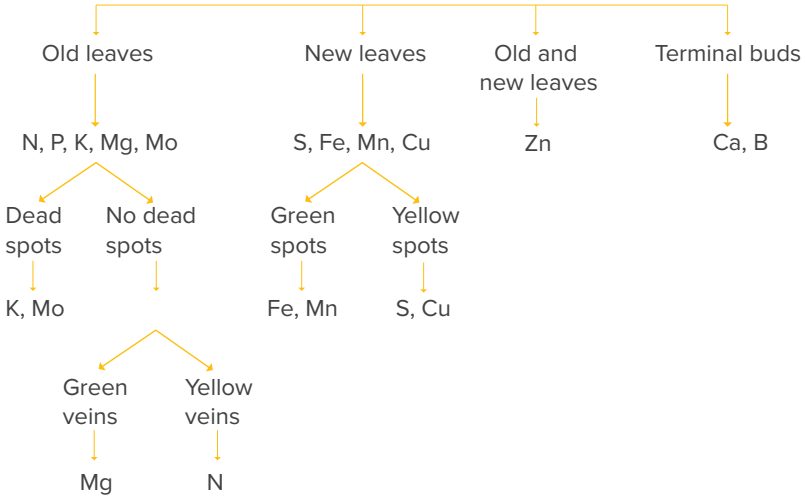

Figure 1: *Considerations when diagnosing nutrient disorders.*

Source: Reddy and Reddi (1997) 'Mineral nutrition, manures and fertilizers'. In "Principles and Agronomy". pp.204-256. Kalyani Publishers, Ludhiana, India.