



# 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

**i 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

## SECTION 9 VETCH

FEEDBACK

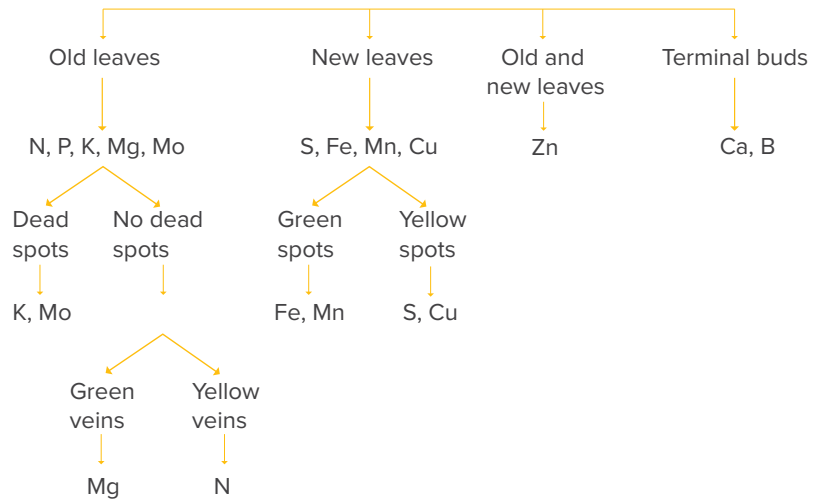
**Table 1:** A guide to nutrient deficiency symptoms.

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

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**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.