

# NODULATION ASSESSMENT KIT

GUIDE TO ASSESSING NODULATION IN PULSE CROPS

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Photos supplied by Dr Alan Gibson  
CSIRO, Plant Industry, Canberra

# GUIDE TO ASSESSING NODULATION IN PULSE CROPS

## by Janine Carter, VIDA, Horsham

### CROPS:

\* Field peas, Chickpeas, Faba beans and Vetch all have a similar type of nodulation pattern. The 0-5 photos of any of these crops could be used to assess lentils too. I have used chickpeas as a standard for all these crops in my "Grower guide to assessing nodulation in pulse crops" for simplicity.

\* Narrow leaf and broad leaf lupins have a different nodulation pattern compared to the above crops. In my guide I have used narrow leaf lupins as the standard.

### 0-5 SCORES:

\* Above each photo for each crop there is a 0-5 score.

\* **0, 1, 2 all represent POOR nodulation**

\* **3, 4, 5 all represent GOOD nodulation**

\* The two photos in my grower guide show nodulation at the 3 stage.

### WHEN TO SCORE?

\* The earliest crops should be scored at is 10-12 weeks after sowing.

\* Crops can still be scored up until the end of October.

### NOTES ON NODULATION:

\* When looking at plants in the field it is likely that you will find nodules on lateral roots as well as the main tap root. However, the photos mainly show nodulation on the tap root but you can still use them to compare the total nodule mass present in order to work out good or poor nodulation.

\* Nodulation around the crown of the tap root is considered more effective than nodules scattered out on the lateral roots. This may become relevant if you come across a situation where you think plants are borderline between 2 and 3 (ie. check the position of the nodules).

\* Don't forget to check whether the inside of the nodules are red/pink (effective) in colour rather than white or green (ineffective).

### WHAT IF I SCORE POOR NODULATION?

#### *Possible causes:*

No inoculant used and no native rhizobia in soil present either

Inoculant used but seed coverage poor

Inoculant used but not stored in cool conditions before use

Inoculant mixed with seed dressing

Inoculated seed left for more than 2 days before sowing

Crop under stress (eg. nutritional, waterlogging, herbicide)

#### *Effect on crop:*

Poor nodulation can cause between 10-50% yield loss in that pulse crop not to mention the lower potential nitrogen benefits to following crops. Pulse crops which are poorly nodulated will be utilising more soil nitrogen than adequately nodulated crops would.

# Grower guide to assessing **NODULATION IN PULSE CROPS**

**GRDC**  
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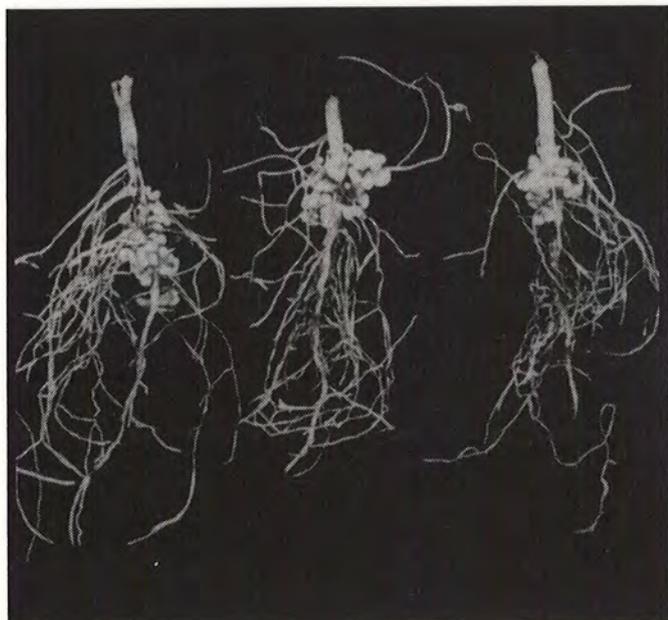
## **METHOD:**

1. Sample 10 plants (each plant 5m apart) carefully using a fork or shovel.
2. Wash dirt off in a bucket of water.
3. Score sample.

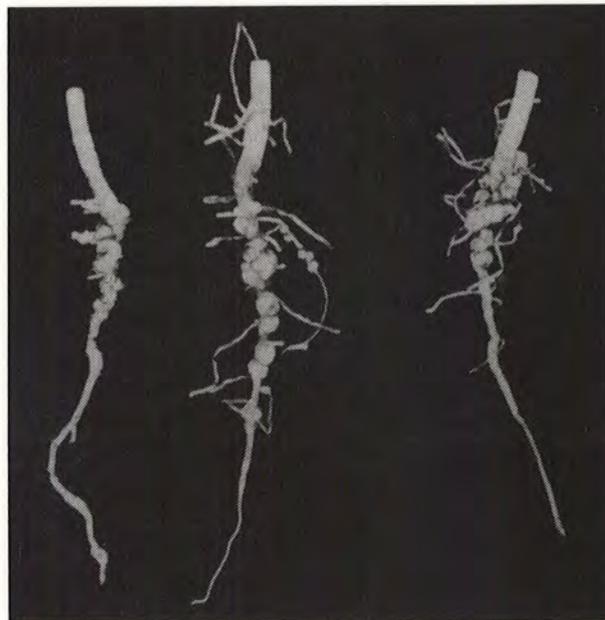
## **SCORE:**

<b>No</b>	no nodules present.
<b>Poor</b>	nodulation less than in photo for 4 or more plants out of 10.
<b>Adequate</b>	nodulation similar or better than in photo for 7 or more plants out of 10.

**Note:** Plants scored as *Adequate* should all have nodules which are red/pink in colour.



*Adequate* nodulation in  
FIELD PEAS, CHICKPEAS,  
FABA BEANS or VETCH



*Adequate* nodulation  
in LUPINS

VETCH

0  
POOR



1  
POOR



VETCH

2  
POOR



3  
GOOD



VETCH

4  
GOOD



5  
GOOD

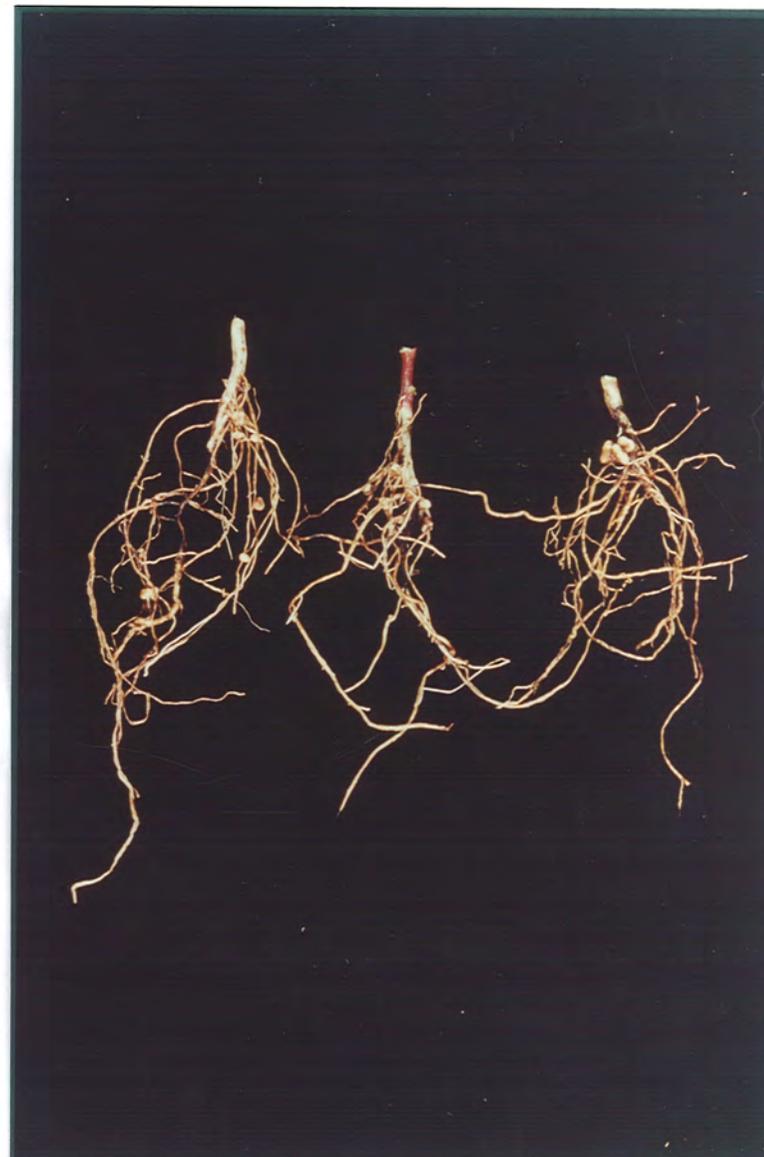


CHICKPEAS

0  
POOR



1  
POOR



CHICKPEAS

2  
POOR



3  
GOOD



CHICKPEAS

4  
GOOD



5  
GOOD



FIELD PEAS

0  
POOR



1  
POOR



FIELD PEAS

2  
POOR



3  
GOOD



FIELD PEAS

4  
GOOD



5  
GOOD



FABA BEANS

0  
POOR



1  
POOR



FABA BEANS

2  
POOR



3  
GOOD



FABA BEANS

4  
GOOD



5  
GOOD



NARROW-LEAF LUPINS

0  
POOR



1  
POOR



NARROW-LEAF LUPINS

2

POOR



3

GOOD



NARROW-LEAF LUPINS

4  
GOOD



5  
GOOD

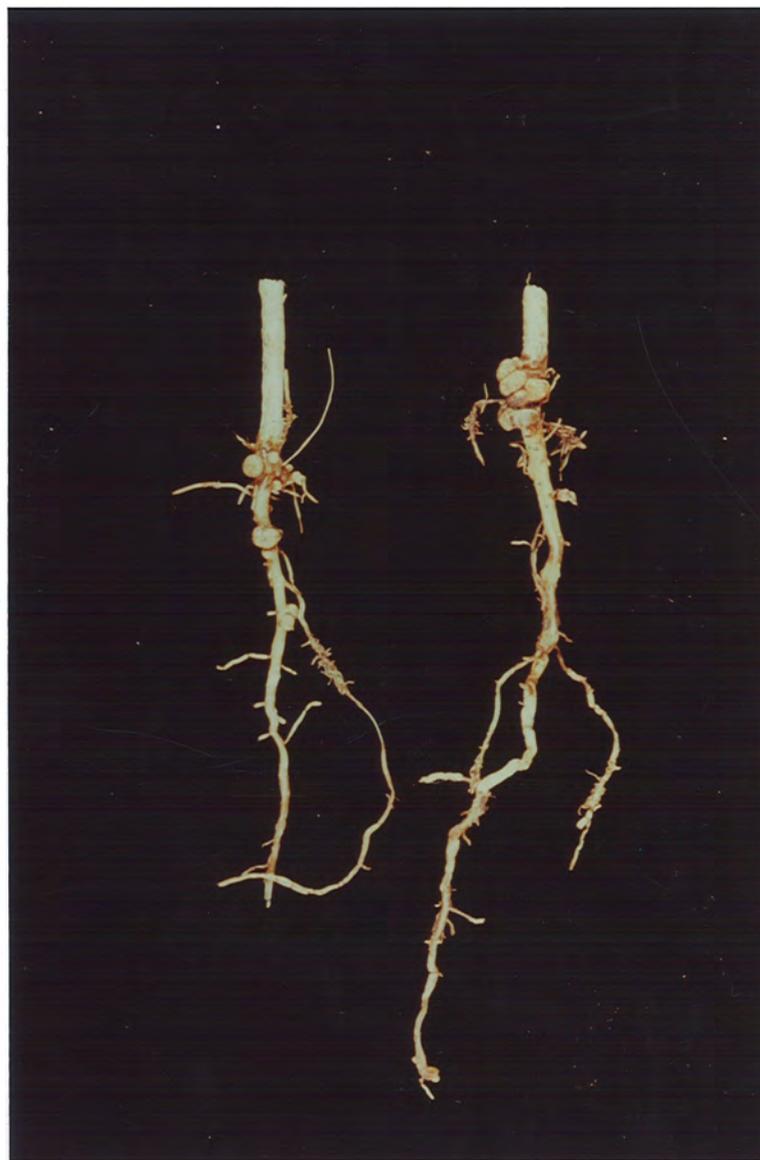


BROAD-LEAF LUPINS

0  
POOR



1  
POOR



BROAD-LEAF LUPINS

2  
POOR

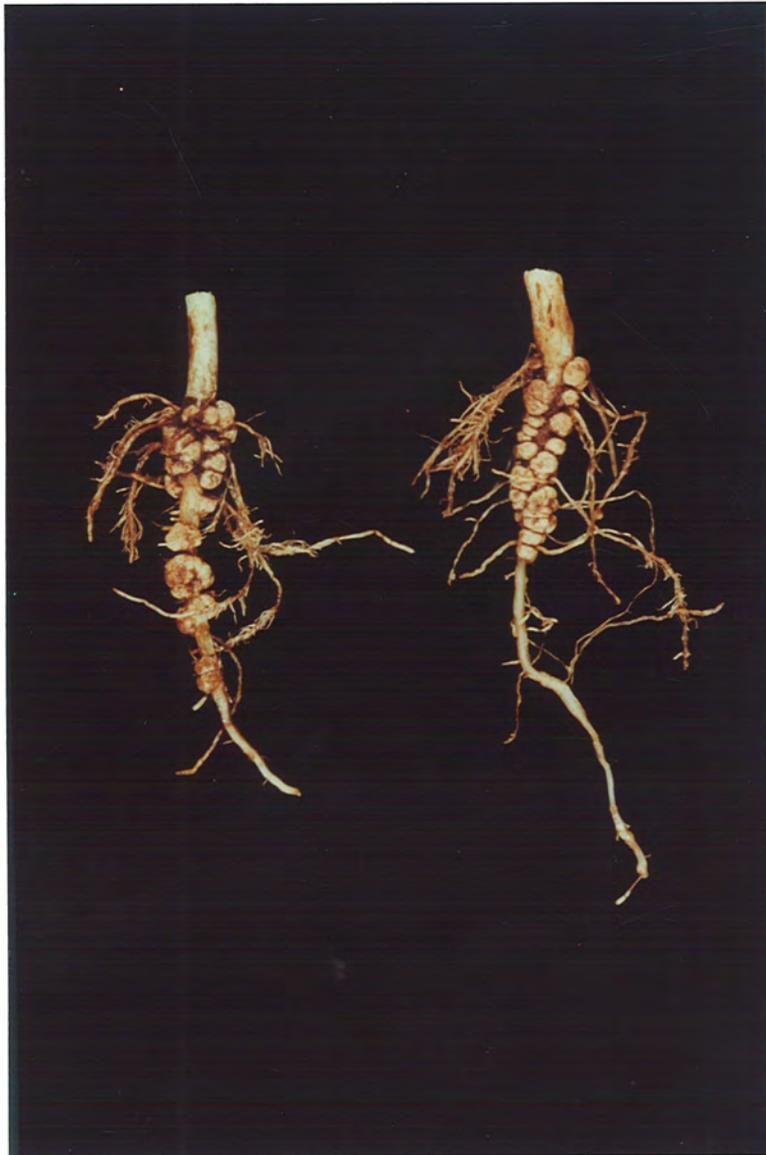


3  
GOOD



BROAD-LEAF LUPINS

4  
GOOD



5  
GOOD

