



Assessment of *Aphanomyces euteiches* on pea roots

Method/protocol submitted by:

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Objectives of the method/protocol:

To estimate the severity of *Aphanomyces euteiches* on pea roots.

Brief description of the method/protocol:

A visual scoring scale is given to assess *Aphanomyces euteiches* on pea roots

Possible uses of this method/protocol:

This protocol could be used for instance to determine the level of resistance of different genotypes to *Aphanomyces euteiches*.

Method/protocol:

- Sampling of the plants
In the field, 20 plants at the 4-5 leaf stage are removed per plot. They are washed, and assessed individually.
- Disease assessment
A disease index is given to each plant according to the following scale (see figure below):
 - 0 = no symptoms,
 - 1 = discoloured traces on rootlets,
 - 2 = discoloured to honey-brown zones on rootlets and part of the tap root, covering at least one quarter of the root system,
 - 3 = honey-brown, soft zones covering at least half of the root system, epicotyl in some cases discoloured and water-soaked, but still firm,
 - 4 = most of the root system soft and honey-brown to dark brown, epicotyl soft and brown, shrivelled, first leaves yellowing,
 - 5 = plant dead

The Root Rot Index (RRI) mean values can be transformed into disease severity classes as follows:

Class 1: $DI=0$

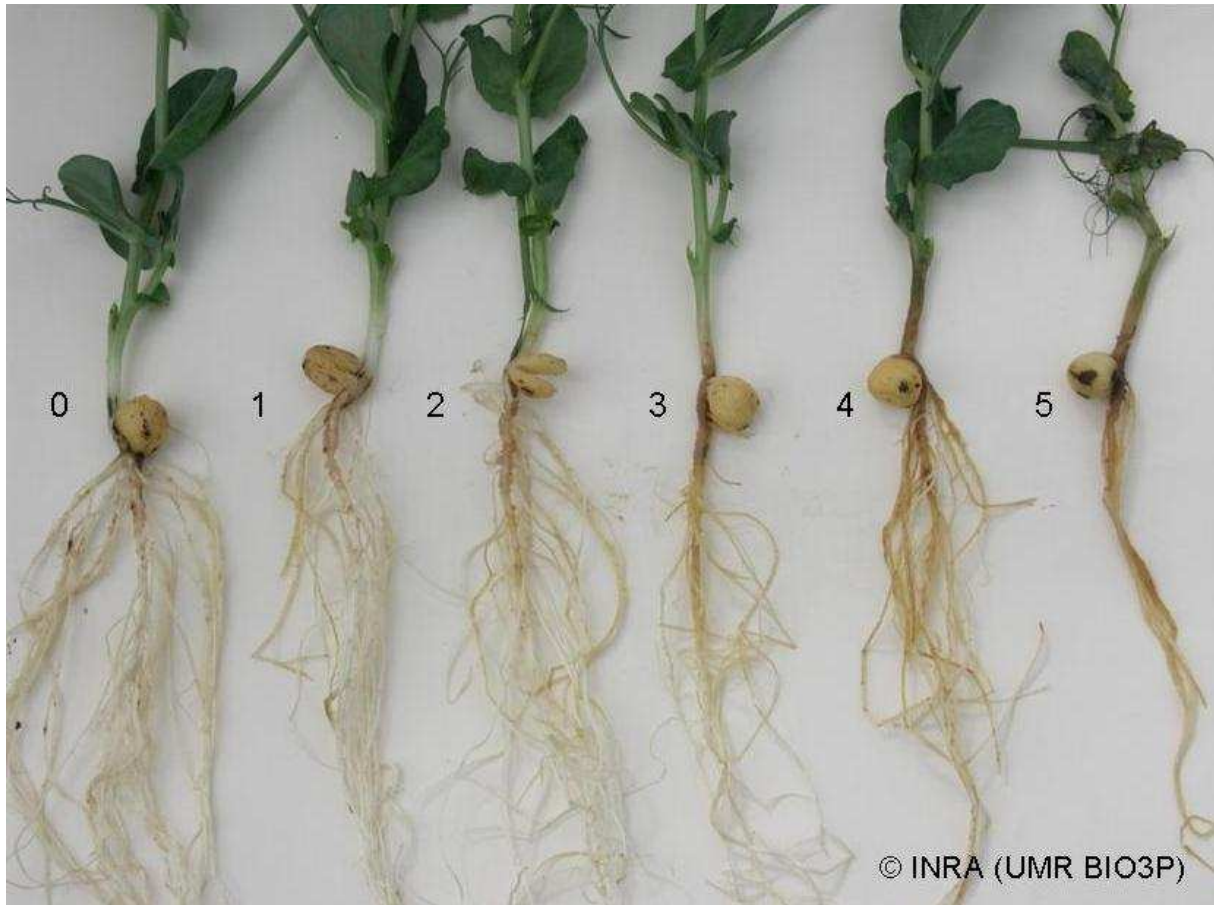
Class 2: $0 < DI \leq 1$

Class 3: $1 < DI \leq 2$

Class 4: $2 < DI \leq 3$

Class 5: $3 < DI \leq 4$

Class 6: $4 < DI \leq 5$



Advantages/disadvantages of the method/protocol:

In the field, it is difficult to identify *Aphanomyces* root rot from the flowering because of the root colonisation by other fungi such as *Fusarium* sp.

References or examples of studies carried out by using this method/protocol:

Wicker E., Hullé M., Rouxel F. (2001). Pathogenic characteristics of isolates of *Aphanomyces euteiches* from pea in France. *Plant Pathology* 50: 433-442.

Wicker, E, Moussart A, Duparque M, Rouxel F (2003). Further contributions to the development of a differential set of pea cultivars (*Pisum sativum*) to investigate the virulence of isolates of *Aphanomyces euteiches*. *Eur. J. Plant Pathol.* 109: 47-60.

Le Guennou F., Pilet-Mayel ML., Baranger A., Rouxel F. and Tivoli B. (2009). Spatial distribution of *Aphanomyces euteiches* inoculum in a naturally infested pea field. *European Journal of Plant Pathology*, 123: 153-158.