Assessment of ascochyta blight (*Mycosphaerella pinodes*) on pea

Method/protocol submitted by:

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Objectives of the method/protocol:

To estimate the severity of ascochyta blight on pea under field conditions.

Brief description of the method/protocol:

This protocol presents a sampling and an assessment method to assess the ascochyta blight development on stems, stipules and pods in field experiments on pea. A severity scale is given for the assessment on pods and stipules.

Possible uses of this method/protocol:

This protocol can be used for instance to investigate the effect of pea-cereal intercropping on ascochyta blight.

Method/protocol:

- Observation unit

Plots (30 m^2) consist of five strips (1.2 m wide × 5 m long) sown with a six-row drill at 18 cm row spacing.

- Sampling of the plants

Plants are sampled at several dates during the cropping season. Period and frequency are adapted to the objectives of the experiment. At each sampling date, one sample (50 cm×3 rows) is removed per plot, leaving at least 50 cm between two consecutive samples. Ten pea plants are then randomly chosen per sample.

- Disease assessment
  - Disease assessment on stipules and pods.

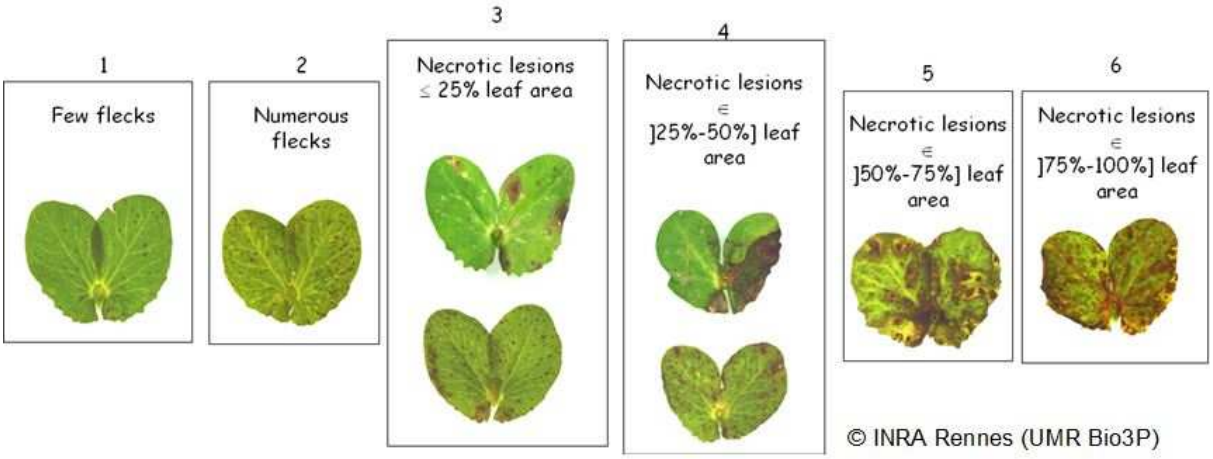
    Disease severity is scored at each node using a 0–6 scale adapted from the 0–5 scale previously described by Roger and Tivoli (1996): see below. The mean disease score per plant is calculated by averaging the disease scores of the different nodes.

    - Severity scale for stipules and pods:

      The organ is assigned to one of the following classes:

0 = no symptoms,
1 = few flecks,
2 = numerous flecks,
3 = coalescing necrotic lesions covering <25% of the organ area,
4 = 25–50% of the organ area necrotic,
5 = 50–75% of the organ area necrotic,
6 = >75% of the organ area necrotic

The severity scale for stipules is presented by the pictures below:



o Disease assessment on stems

Ascochyta blight is also assessed on the main stem, or on branches if the main stem has aborted. Disease severity is assessed by the percentage of stem length girdled by lesions one week before harvest or the day of the harvest: see figure below.

- Evaluation of the percentage of stem girdled by lesions:

  This percentage is obtained by the formula:

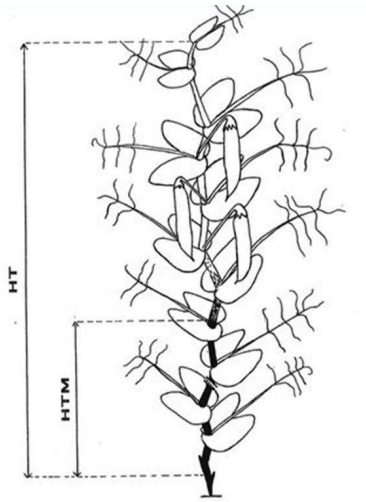
  $$\%HTM = HTM*100/HT$$

  With:

  %HTM = percentage of the stem girdled by lesions

  HTM = length of the stem girdled by lesions

  HT = total length of the stem



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

Schoeny, A., Jumel, S., Rouault, F. and Tivoli, B. (2009). Effect and underplaying mechanisms of pea-cereal intercropping on the epidemic development of ascochyta. European Journal of Plant Pathology, 126: 321-331.

Roger, C., & Tivoli, B. (1996). Spatio-temporal development of pycnidia and perithecia and dissemination of spores of Mycosphaerella pinodes on pea (Pisum sativum). Plant Pathology, 45, 518–528.

Tivoli B. (1994). Conséquences des attaques parasitaires foliaires sur l'élaboration du rendement des plantes à croissance indéterminée. In Agrophysiologie du pois protéagineux,Ed. INRA-ITCF-UNIP, p 199-219.

Tivoli, B., Béasse, C., Lemarchand, E. and Masson E. (1996). Effect of Ascochyta blight (Mycosphaerella pinodes) on yield components of single pea (Pisum sativum) plants under field conditions. Annals of Applied Biology, 129: 207-216.