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## Effectiveness of fungicides against foliage blight caused by *Phytophthora infestans*

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### Purpose/aim of trials

To compare the “Effectiveness to leaf late blight” by measuring the protection of leaves against infection by late blight caused by application of a fungicide in a standard 7-day spray schedule (this standard spray schedule is not necessarily related to the label recommendations). This protection originates from the protectant and/or curative properties of the active ingredients and in the rapid growth phase of the crop also protection of new growth can contribute to the effectiveness of the fungicide for leaf blight control.

EPPO guideline PP 1/2 (3) (revised in 1996) describes the standard requirements of the field trial.

### Specific additional requirements:

- A susceptible local ware potato variety. The growth habit of the cultivar should be recorded i.e. determinate or indeterminate growth.
- In order to obtain a long-lasting infection pressure, one or more measures can be chosen according to local conditions.
  - 2 untreated spreader rows along the complete length of the trial that consist of a susceptible (Bintje) and an intermediate resistant variety (for example Nicola)
  - Spreader rows with one variety and selective fungicide use on the spreader row
  - Surrounding the trial with maize
  - Include untreated plots in every replicate
- Individual plants in the spreader rows are artificially inoculated with a recently isolated, metalaxyl-sensitive, *P. infestans* isolate (or a mixture). When the length of the plots is eg. 10 m, 1 plant is infected per 10 m. So, one plant (susceptible) adjacent to each plot is inoculated with *P. infestans*. The artificial inoculation is carried out 3 days before the first spray until 7 days after the first spray. When the inoculation is not successful it will be repeated.
- Misting is permissible when conditions are exceptionally dry and disease is not progressing.
- Each treatment consists of applications of the fungicide to be tested throughout the season, regardless of the limited application numbers on the label
- First spray depends on local conditions, but needs to be applied before the first attack (preventive).
- Crop cover provides information on how much of the fungicide spray was intercepted by the crop. Crop cover is defined as the percentage of the soil surface obscured by foliage when viewed from above. A grid divided into 20 equal squares allows cover to be assessed

- to the nearest 5%. Assess by holding the grid at a fixed height above the crop and estimate what percentage of the grid area is filled by leaf material. Assessments should be made at each fungicide application until crop cover reaches 100%. They can also be made if cover declines from 100% towards the end of the growing season.
- Crop growth stage should be recorded on the days that the trial is sprayed. The BBCH key should be used.
- Spray frequency is **every 7 days** (+/- 1 day) until desiccation
- Dose rate is highest preventative dose registered in Europe
- Assessment: every week (or more frequently when necessary) in spreader rows and plots by rating the % infected leaf area. To assess blight we recommend using the assessment key in the EPPO-guideline combined with the key published in Trans. Brit. Mycol. Soc. 31 (1947): 140-141 (is attached). It is also possible to use the Dutch PD scale guideline.
- Although the trial is carried out to assess effectiveness to leaf blight, we recommend to also assessing stem blight when stem lesions occur. We recommend assessing stem blight by placing a 0.5 m square quadrat at four to six places in the plot and assess the surface area of visible stem that has symptoms of stem blight. The scale used is 0, 0.1, 0.5, 1, 2.5, 5, 7.5, 10, 12.5, 15, 17.5 and 20% and then increasing in 5% increments. The assessments should be made when the stem tissue is still mainly green otherwise it is difficult to distinguish stem blight from other symptoms.
- Desiccation: timing and method according to GAP.
- It is not strictly necessary to harvest the trial. To assess tuber blight a specific protocol is made.
- A method for determining the rating for the “EuroBlight Fungicide Table” will be proposed when 6 successful trials (2 seasons x 3 trials) have been carried out by independent research institutes in at least 3 different growing regions/countries in Europe. The proposed methodology will be agreed by independent researchers and the agrochemical manufacturers and where possible will be used to analyse data from registration trials, in which the relevant standard products are included. In this way a robust dataset will form the basis of the rating given for the “Effectiveness against leaf blight”.

N.B. A successful trial is one that is strictly carried out according to this protocol and late blight is observed in the plots (>10% foliar infection in the worst treatment). The rating is set by determination and comparison of the AUDPC's of the 6 successful trials. **A validation of this method will have to be carried out with existing trial data to find out whether a linear, a logarithmic or another transformation has to be carried out on the data.** It will be investigated whether it is possible to determine a rating for “Effectiveness leaf blight”

- Until flowering
- During the whole growing season

Dividing the rating in this way will account for the specific additional characteristics of products in specific growing phases of the crop.