

# How to identify potato cultivars which are resistant to late blight?

## Problems

Late blight, caused by the fungus *Phytophthora infestans* (Fig. 1), represents one of the most important yield limiting factors in organic potato growing. Breeding for resistance is one important measurement to reduce blight damage. However, conventional potato trials, which are conducted with the use of fungicides, do not provide organic farmers with any information on the cultivar's resistance to late blight.



**Figure 1:** Late blight infections on leaf surface, underside of the leaf and stem of potato plants (FiBL & ORC, 2017).

## Solutions

Cultivar 1
Reference cultivar
Cultivar 2
Cultivar 3
Reference cultivar
Cultivar 4
Reference cultivar

Organic farmers can set up a simplified cultivar trial to identify potato cultivars which are resistant to late blight (see Fig. 2). In a simplified design, a reference cultivar (which is known to have a good resistance against late blight) is grown in 2-3 plots, randomly distributed in the trial field. Cultivars to be tested are grown in plots without repetition. If the reference cultivar displays a similar resistance to late blight in all repetitions, it can be assumed that environmental conditions uniformly influence the field trial. Thus, varietal differences in disease resistance, are likely to be the result of the genotype.

**Figure 2:** Example for a field map using a simplified design for cultivar trials.

## Practical recommendations

Throughout the growing season, leaf surface, underside of the leaf and stems should be inspected for late blight infections (see Fig. 1). Traits which are useful to assess the cultivar's resistance against late blight are:

- good yield performance in short growing period
- fast canopy development
- early tuber set and fast tuber bulking
- early maturity

It is recommended to use pre-sprouted seed potatoes in cultivar trials. Pre-sprouting is a measurement in which seed potatoes are exposed to conditions that promote the development of sprouts which emerge earlier after planting. As a result, the growing period is shortened, potatoes can be harvested earlier, and thereby, weather conditions are avoided which are favourable for late blight infestation.

**Authors:** Kaja Gutzen (IFOAM EU)

**Contact:** [kaja.gutzen@ifoam-eu.org](mailto:kaja.gutzen@ifoam-eu.org)

**Publisher:** ÖMKi Hungarian Research Institute of Organic Agriculture

**Date:** April 2020

**LIVESEED:** Boosting organic seed and plant breeding across Europe. LIVESEED is based on the concept that cultivars adapted to organic systems are key for realising the full potential of organic agriculture in Europe. Research project 2017-2021.

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