

Identifying late blight reaction types in potato varieties.

In this leaflet you will find descriptions of various types of reaction to late blight (*Phytophthora infestans*) in potato varieties. Resistance in organic crop production is crucial for obtaining acceptable yield and quality. Agrico has an ever growing portfolio of varieties with high scores for late blight resistance. But despite this, there is still a chance that these varieties will show various types of reaction during the growth cycle. There are many different strains of this disease, each showing different spectra of aggressiveness and virulence. By comparing your crop with the disease symptoms shown in this leaflet, you can establish what action needs to be taken. We hope you will find the information in this leaflet useful. If you have any further questions, please contact your sales representative.

Hypersensitivity response in a resistant variety



These images are of potato plants with solid, functional resistance. The foliage is showing hypersensitivity in the form of brown lesions (blotches) and there is no difference between the adaxial and abaxial side of the leaf. Therefore, there is no greyish-white mould (sporulation) visible on the abaxial side in this case. As resistance is in operation in these varieties, the cells affected by late blight are actively destroyed by the plant, which leads to fatal starvation of the pathogen. However, this hypersensitivity reaction looks very similar to the reaction that is seen when *Alternaria solani* is causing early blight. Early blight can be distinguished from late blight by the presence of small brown lesions in concentric rings that look similar to tree growth rings.

Tip!

To find out whether you are dealing with *Phytophthora infestans* or *Alternaria solani*, all you need is a simple plastic container with a lid. Place a few affected leaves abaxial side up on a piece of dampened kitchen paper in the container. Close the lid and leave the container at room temperature overnight. If there is greyish-white mould visible around the edges of the lesion, it is a *Phytophthora infestans* infection.

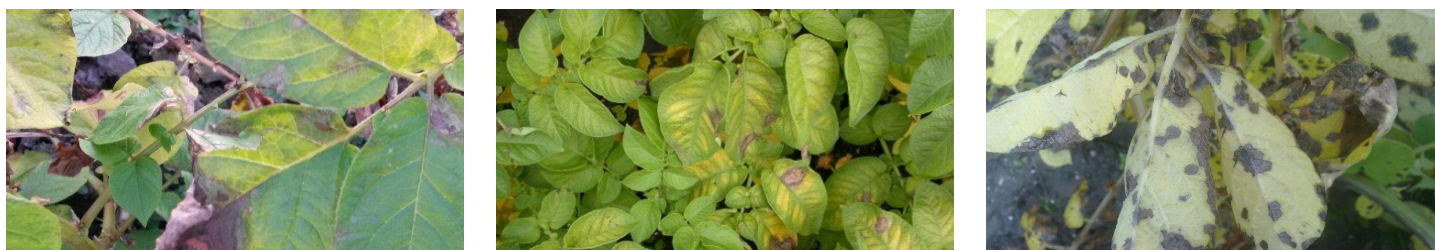
Late blight without sporulation



Here we can see a late blight infection. To check whether the *Phytophthora* is still active, check the abaxial side of the leaf for white mould. If there is a brown blotch on the abaxial side of the leaf but the leaf is dry and there is no mould present, this means the leaf is showing a reaction but the resistance gene is still functional. You don't need to defoliate the crop in this case. The foliage is infected with late blight but the variety's resistance has prevented sporulation.

It may also happen that susceptible varieties become infected with late blight but due to a period of hot, dry weather with high UV levels, the mould dries out and does not sporulate. The infection is kept in check in these circumstances. However, you still need to keep a close eye on the crop. If the pressure from late blight starts to build again and the conditions favour the disease, any *Phytophthora* present will attack the crop fast. A late blight infection is easy to spot (visible sporulation), especially in the morning in dewy conditions. If there are no visible signs of sporulation in the morning, there is no need for defoliation.

Mildly sporulating reaction in a mature crop



Here we can see a maturing, less vital crop with lesions showing mild sporulation. Because the crop is barely investing in its resistance response by this stage, the symptoms are more severe. Late blight is mainly evident in the lower leaves (these are often the leaves that turn yellow). Despite this appearance, the plant's resistance has not been breached and the tuber's resistance is still functional. When you see these symptoms, you don't need to defoliate the crop straight away to destroy the infection. Because the crop is already maturing, it won't be long until it defoliates naturally. Most late blight resistant varieties also have good tuber resistance, with a few exceptions. So it's important to be aware of each variety's tuber resistance score.

Late blight infection with sporulation in a resistant variety



Here we can see dark lesions on the leaves with clear greyish-white mould on the abaxial side in the zone between green and dead tissue. For resistant varieties, this means that the resistance to that particular strain of *Phytophthora* will not hold up during the rest of the growing season. It is now important to defoliate promptly because *Phytophthora* will destroy the canopy easily and may also cause rot in tubers.

It is by no means certain that the same resistance breaking strain of *Phytophthora* will be active again in future years in your area. This means that resistance in varieties can be re-used year after year in a similar fashion.

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