

Latent infection rate of potato seed tubers with *Phytophthora infestans*

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Introduction



Figure 1: Stem blight

Aim:

Get an overview on the latent infestation rate of certified potato seed tubers with *P. infestans*.

- *Phytophthora infestans* is often brought to the field by latent infected potato seed tubers
- Pathogen grows and sporulates on tubers at high soil humidity after rainfall
- Sporangia spread via soil water and cause stem blight on neighbouring plants too
- Pathogens overwinter in infected tubers as modern storage conditions prevent its spreading; no visible symptoms appear so latent infections are not assessed during official certification

Materials and Methods

From 2007-2009 a total of 17 batches of certified seed tubers were tested for latent infection with *Phytophthora infestans*, 47 tubers from each charge (respectively 94 in 2007).

Samples were prepared and DNA extracted with DNeasy Plant Mini Kit (Qiagen). Amplification of DNA was performed in an MJ Research PTC-200 thermal cycler and resolved by electrophoresis.

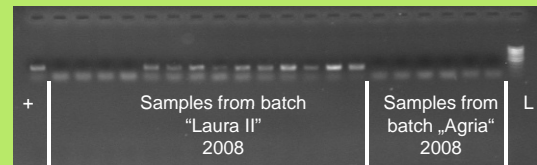


Figure 2: Image of resolved amplification products on 0.9% agarosis gel stained with ethidium bromide. (L : Low range mass ruler DNA Ladder; + : positive standard e.g. DAN extracted from pure *P. infestans* mycelium)

Results

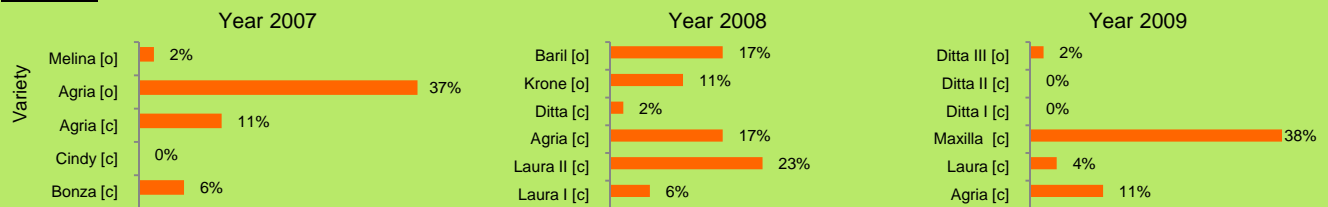


Figure 3, panel 1-3: Latently infected seed tubers in % (2007 n=94, 2008-2009 n=47), [o] organically [c] conventionally produced tubers

- 2 out of 5 tested batches showed latent infections on more than 10% of the seed tubers, one charge was without infection. The mean infection rate was 11.2 %.
- No charge was free of infection and 4 out of 6 were with infestation rates above 10%. The mean infection rate was 12.7%.
- 2 out of 6 tested batches were free of latent infections, the same number showed infestation rates above 10%. The mean infection rate was 9.2%.

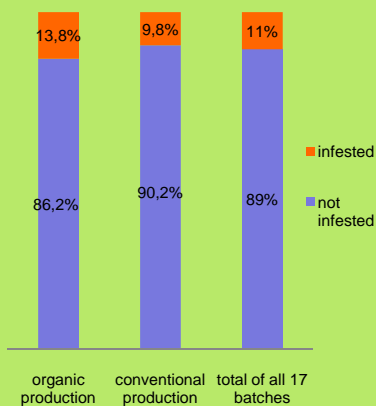


Figure 4: Mean infestation rate of seed tubers with *P. infestans*

- Organically and conventionally produced seed tubers showed no significant differences (t-test, $p < 0.05$) in average percentage of infestation.
- The average infestation rate of all 17 batches was 11%; 3 samples out of 17 were tested negative.

Summary

- Symptomless seed tubers are no guarantee for having healthy tubers, but bear the significant risk of bringing *P. infestans* to the fields.
- The chance of latent infections seems not to be related to whether potatoes are from organic or conventional production. It is a more serious problem in organic farming since no curative fungicides are available.
- Further research should deal with possibilities to reduce latent infections of seed tubers with *P. infestans* as they are the main reason for an early outbreak and a strong late blight epidemic.