

ONION NECK ROT: EFFECT OF INOCULUM DOSE ON SEED TRANSMISSION

Steve Roberts • s.roberts@planthealth.co.uk
Plant Health Solutions Ltd, Warwick, UK • www.planthealth.co.uk

Background

- Neck rot causes significant losses in stored onions with infection levels as high as 48% reported.
- In the UK, it seems mainly associated with *B. aclada*.
- It can be seed-borne, but there are varying claims for the importance of seed infestation in its epidemiology.
- Previous studies have examined seed-to-seedling transmission in relation to the proportion of seeds infested as determined by direct plating.
- This study examined the relationship between seed-to-seedling transmission and the mean dose of *Botrytis aclada* propagules per seed.



Methods

- Seed lots with different inoculum loadings were produced.
- Dose per seed was estimated by dilution plating on selective medium.
- Seeds were sown in module seed trays in the glasshouse.
- Seedlings were sampled at around the 1st true leaf stage, when cotyledons were beginning to shrivel.



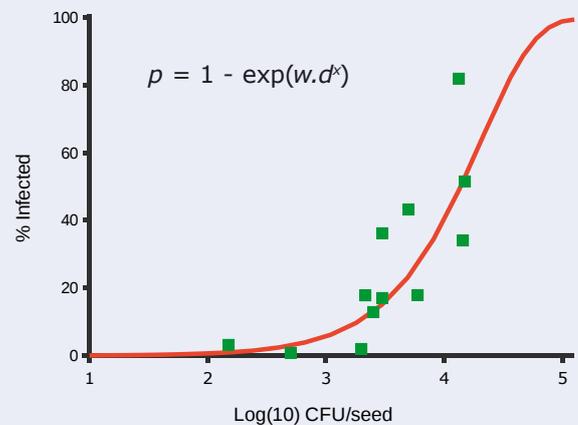
Inoculated seeds were sown in module cells in the glasshouse.



Leaves were harvested and checked for typical *B. aclada*.

Results

- Direct plating: all seed lots were close to 100% infested.
- Mean numbers of *B. aclada* propagules ranged from 150 to 15000 per seed.
- A one-hit model provided a good fit:



- Model parameters:
Mean dose per seed, d
'One-hit' probability, w , 8.8×10^{-5}
Dose parameter, x , 0.94

Discussion

- The mean dose of *Botrytis* per infested seed can have a major impact on seed-to-seedling transmission for onion neck rot.
- Two seed lots could have similar % infestation, but very different inoculum loads: this will result in very different levels of transmission and hence disease levels in the harvested bulbs.
- Direct plating provides little information on the level of inoculum.
- Failure to take into account the inoculum load combined with the impact of environment could explain some claims for a lack of relationship between seed infestation levels and neck rot in the field.

