Functional role of resistance components to prevent tuber blight

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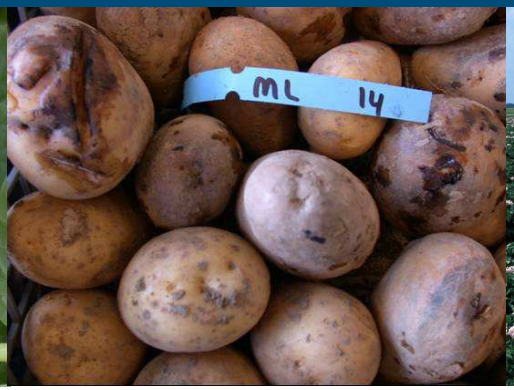


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Outline

- Objective
- Cortex Resistance
- Lesion Growth Rate
- Infection Efficiency
- General discussion & conclusions

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Objective

- Use resistance components to predict the possibility of fungicide dose rate reduction
  - Collect data of resistance components to tuber infection of different cultivars
- Decision rules to prevent tuber infection
  - To avoid tubers as primary inoculum source
  - Reduce environmental impact and possibly fungicides amounts used

Requirements for tuber infection

- Foliage infection
  - Variety
  - Weather conditions
  - Spray schedule
- Sporulation
  - Survival of sporangia
- Wash down of sporangia to the ridge
  - Rain duration
  - Rain intensity

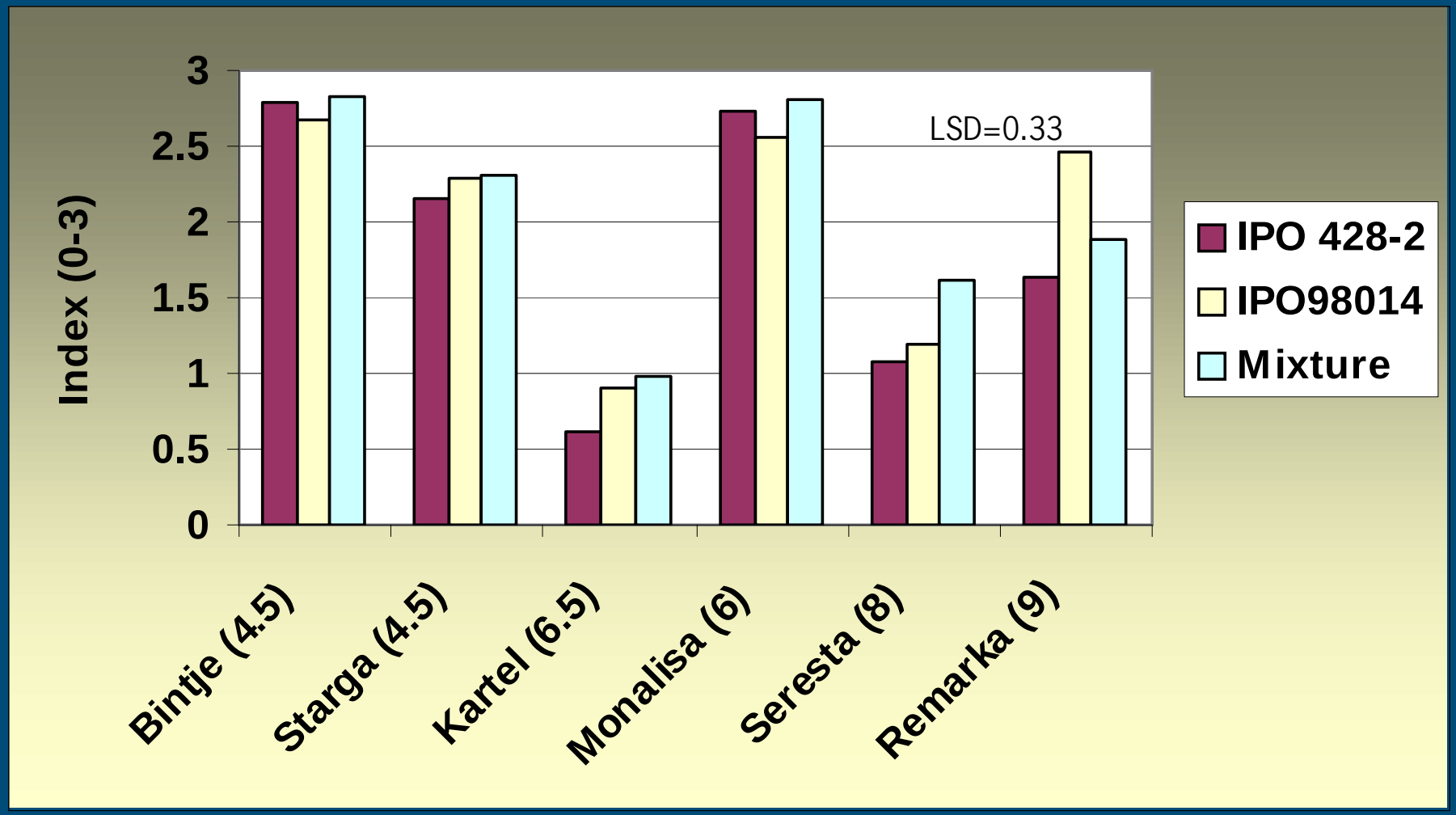
Requirements for tuber infection

- Survival of spores
  - On the soil
  - In the ridge
  - Soil type
- Infection of tubers
  - Cultivar resistance to tuber blight
  - Vulnerability to tuber infection in time
- Carry over of inoculum

M&M (I) Resistance components

- Cortex resistance
  - Specified at end growing season
    - 2005: 6 cultivars
    - 2006: 15 cultivars
    - Phytophthora isolates: IPO98014, IPO428-2, mixture of 15 isolates
  - Index (0-3)
  - % necrotic tissue

Cortex resistance



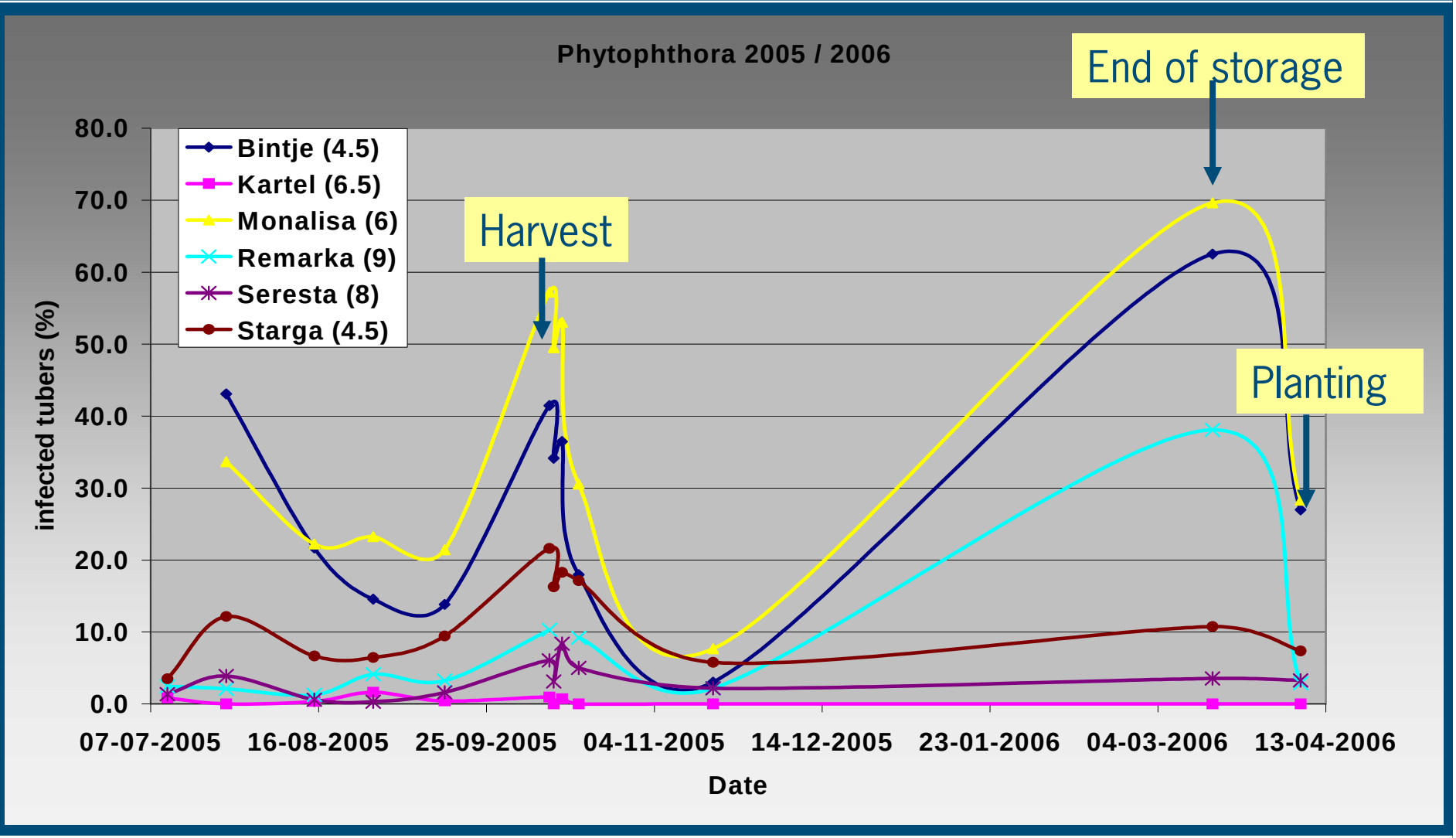
Conclusions

- Some varieties do not sustain spreading lesions
- Tuber infection remains localized in Kartel and Seresta
  - Maybe with less aggressive isolates the infection will stay localized in more varieties
- In general lesion spread is more limited in starch potatoes than in ware potatoes

M&M (II) Infection efficiency (IE)

- During growing season & storage
  - 12 sampling dates
  - 6 cultivars
  - IPO98014 & IPO428-2
- At the end of the growing season 2006
  - 15 main cultivars
  - IPO98014, IPO428-2 & Mixture of 15 isolates

Cultivar resistance to tuber blight during 2005/ 2006



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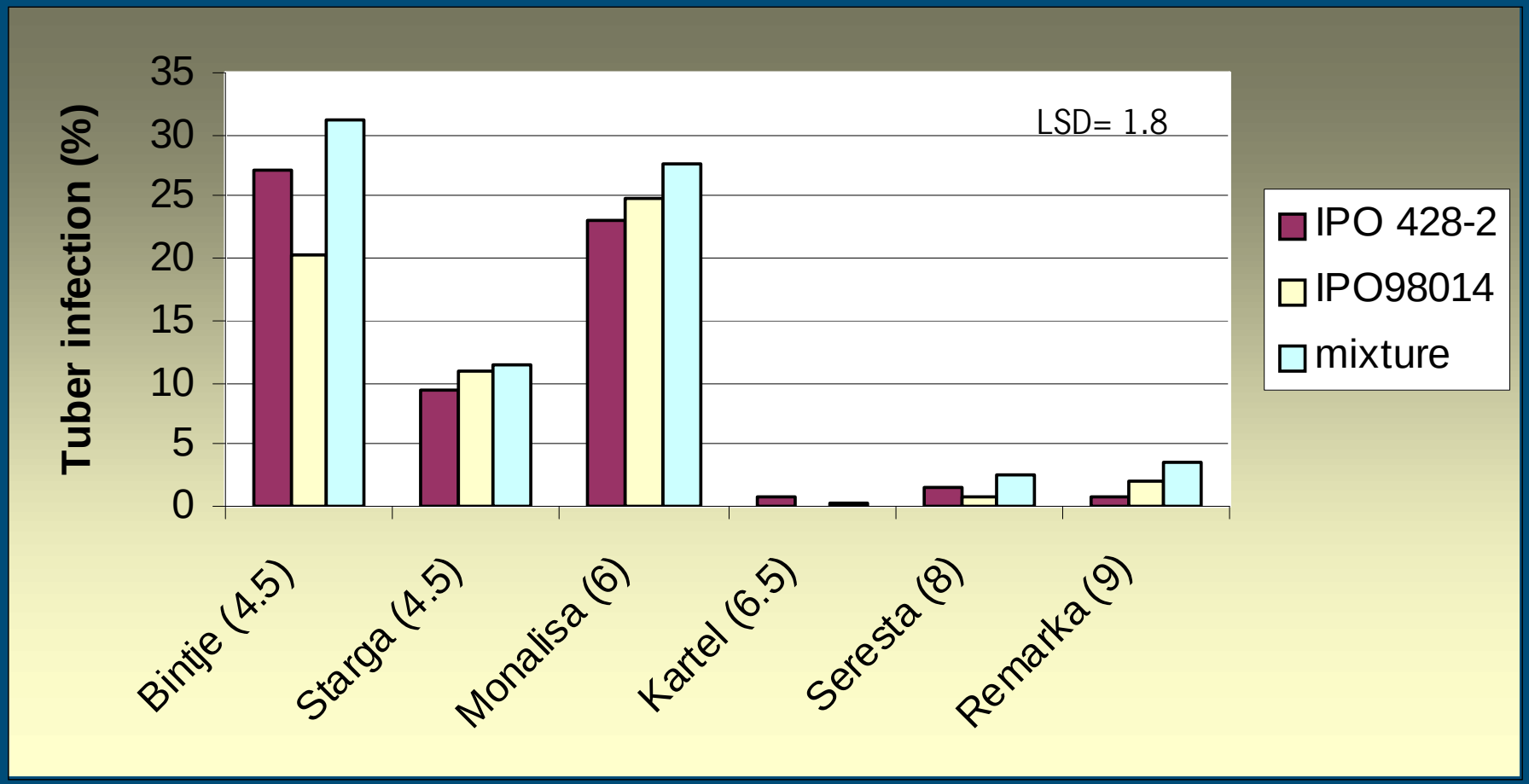
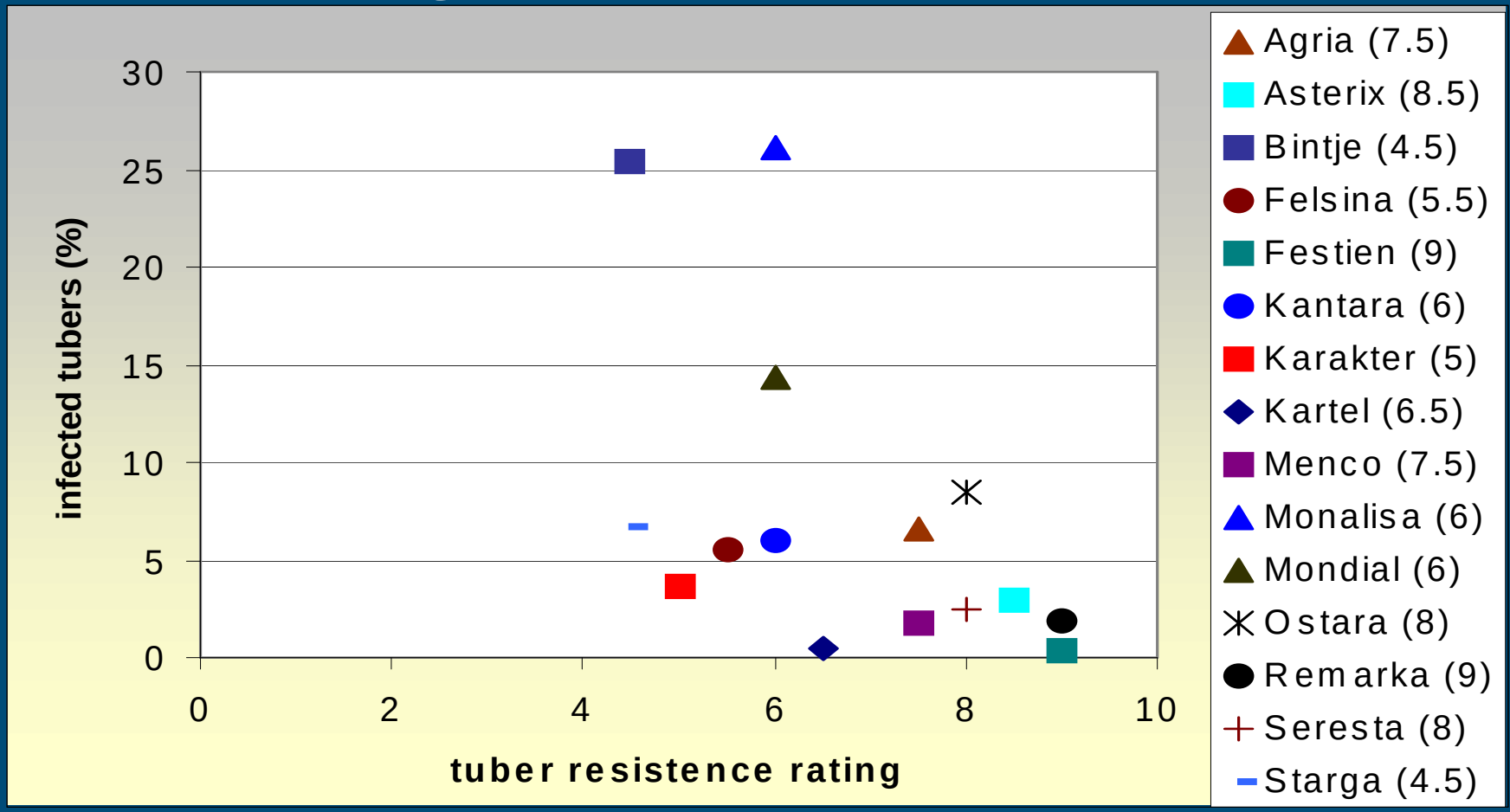
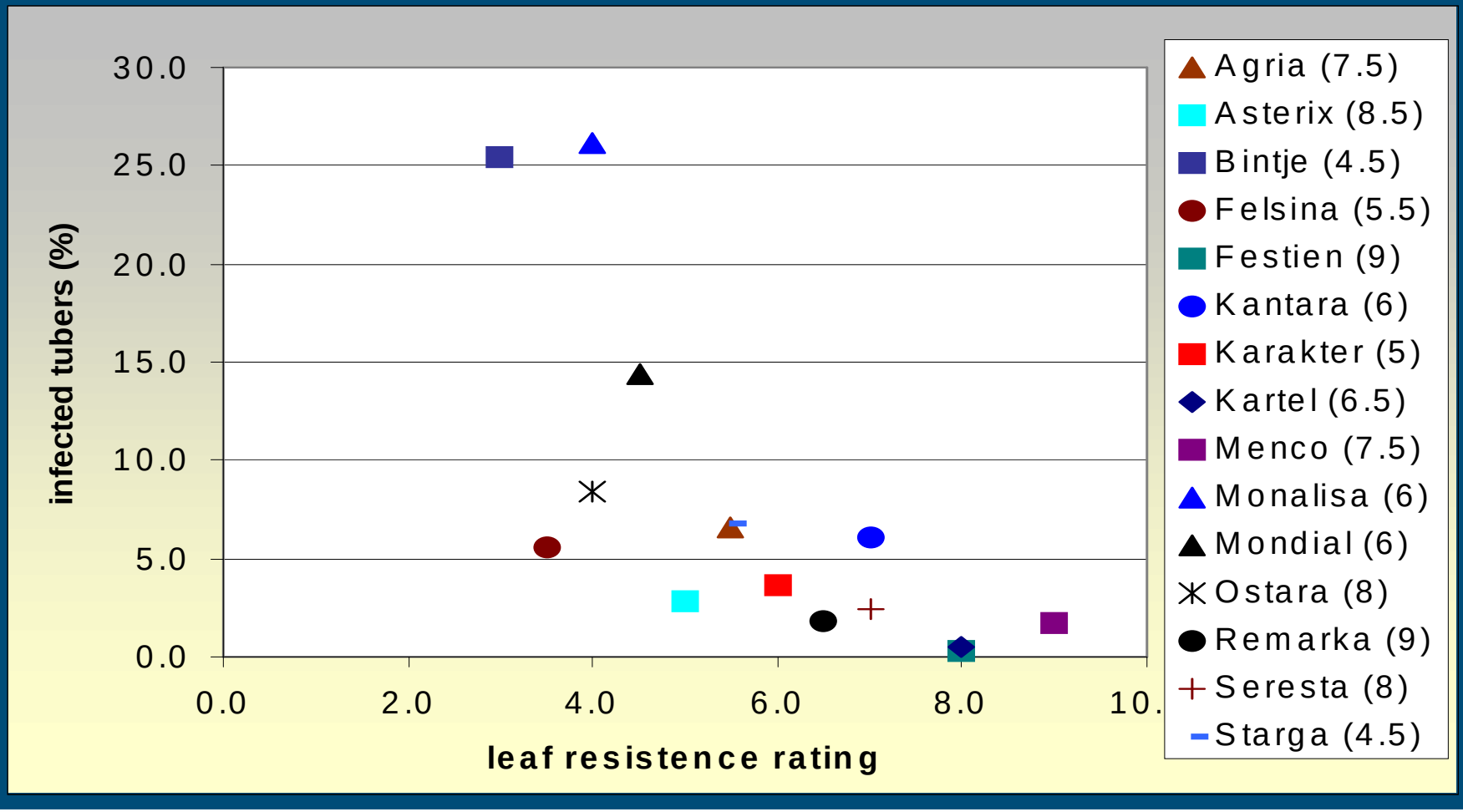
Ratings national list & tuber blight (laboratory)



Relation between infection of tubers and tuber resistance rating (linear: $R^2 = 0.27$)

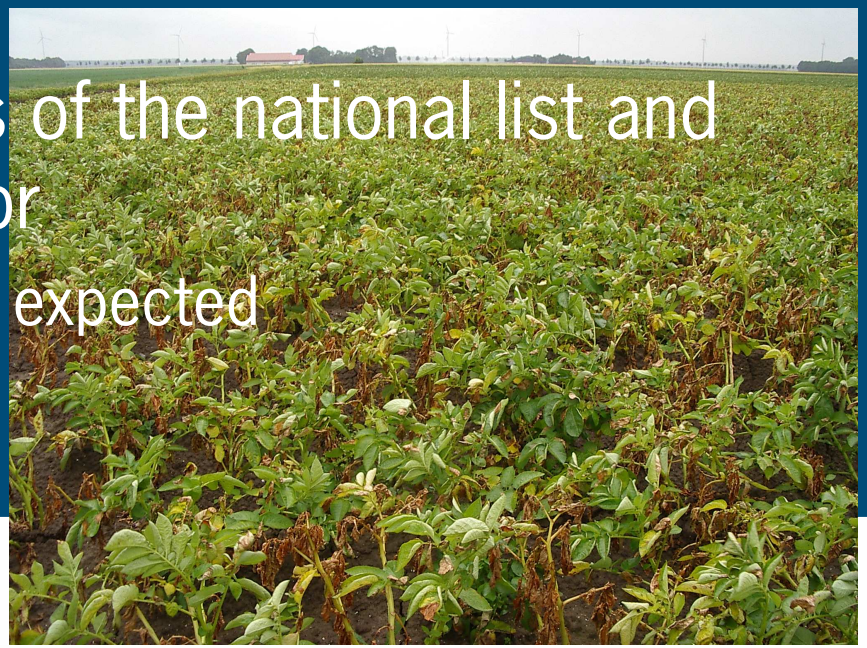


Relation between infection of tubers and leaf resistance rating (Exponential; R^2 = 0.66)



Conclusions

- Physiology of the tuber affects tuber blight infection.
  - Harvest
  - End of storage
- Order of varieties in time seems to remain the same during the season
- Correlation between ratings of the national list and final disease score was poor
  - Kartel performed better than expected
  - Ostara worse



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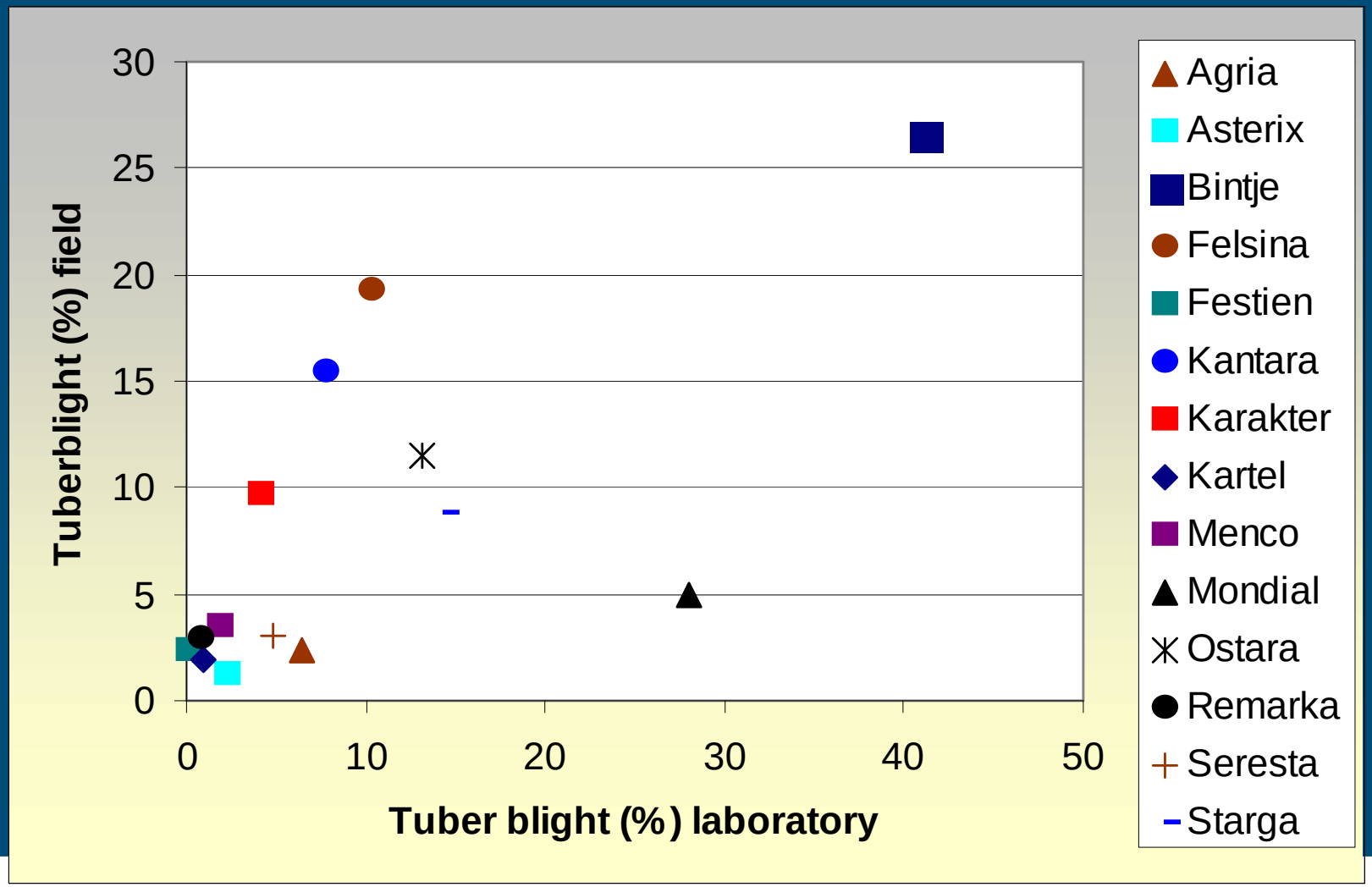
M&M (IV) Field experiments Lelystad

- 5 years: 2002 – 2006
- Foliar: reduced dose rates Shirlan (2002-2004)
  - Polycyclic field experiments with spreader rows
- Tuber: reduced dose rates Shirlan (2005-2006)
  - Polycyclic field experiments with spreader rows

Tuber blight



Conclusions

- Beware of the isolate used when testing resistance ratings
  - Preferably tests should be run with new modern isolates
  - A mixture of isolates is an option
  - At least an aggressive isolate should be chosen to simulate worst case scenario's
- Very low tuber blight ratings in the laboratory seems to coincide with low tuber blight incidence in the field.
  - Dose rate reduction seems to be possible only with those varieties

Thank you for your attention!

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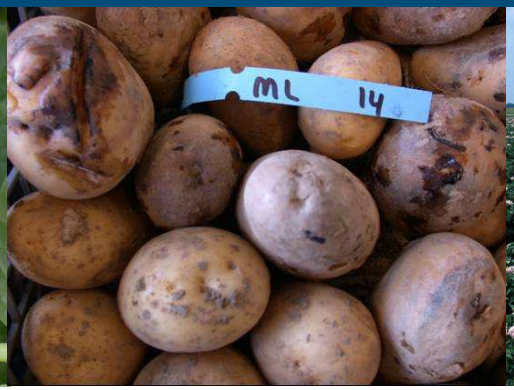


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