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Impact of powdery scab (*Spongospora subterranea*) on the Swiss potato seed production

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Agroscope





Seed potato production in Switzerland

NL: 35'000 ha

D : 18'000 ha

F : 15'000 ha

CH: 1'500 ha

No selection in Switzerland

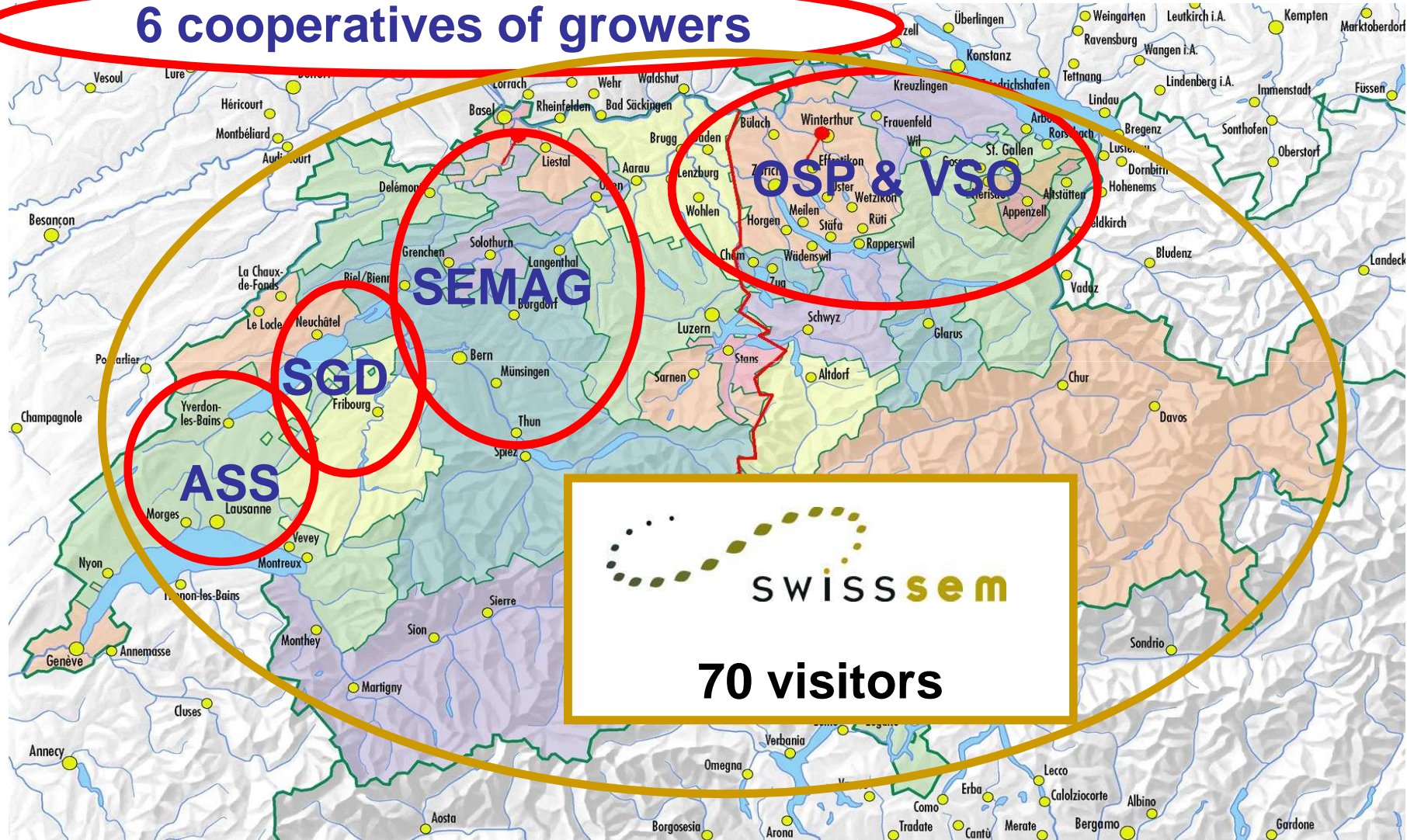
Potato seed demand:
25'000 T / year
Import:
2-3'000 T / year





Swiss potato seed production actors

6 cooperatives of growers





Standards

Standard for certified seed (%)	Control	CH	EU	UNECE
Quaranteen diseases	Crop	0	0	0
Pectobacterium/Dickeya	Crop	1	4	1,5
PVY	Crop	0,2	10	1
	Lot	10	10	10
Powdery scab	Lot	---	5	3
Rhizoctonia	Lot	---	---	5

- No standard for Powdery scab in Switzerland



Control of external defects

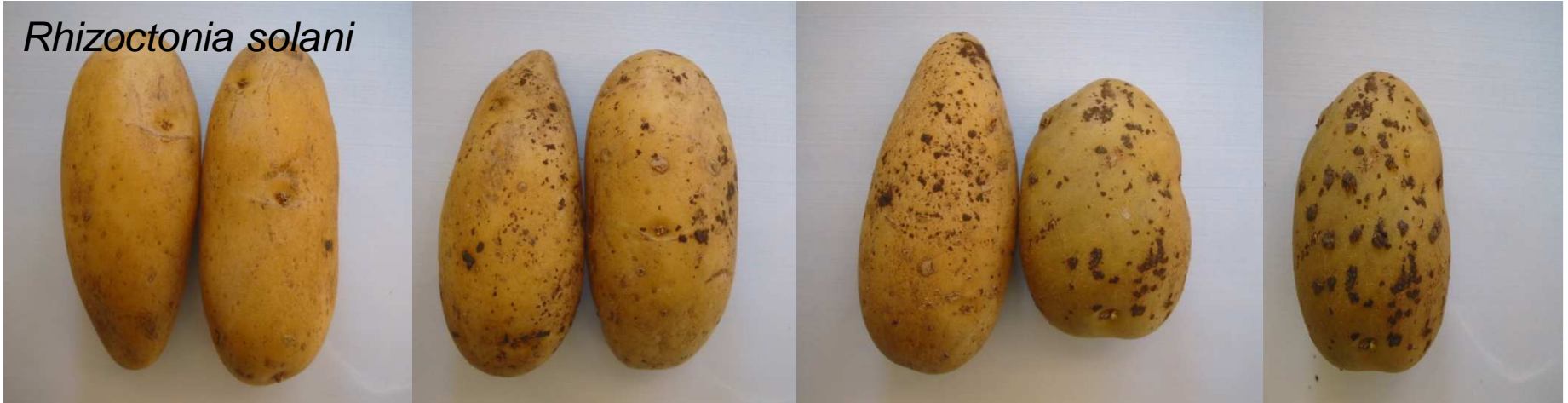
- Objectives
 - Early information on seed lot quality concerning infections by *Rhizoctonia* and Scabs (*Spongospora* and *Streptomyces*)
 - Decision support system to eliminate the too infected lots (non-binding test)
 - Duration and size of the sample (5239 lots):
 - 2006 : 750 lots of Agata, Agria, Charlotte, Innovator and Lady Claire
 - 2007 : 1164 lots all varieties
 - 2008 : 1153 lots all varieties
 - 2009 : 1094 lots all varieties
 - 2010 : 1078 lots all varieties
- All Swiss potato seed production



Material and method

- Sampling procedure
 - Sampling of 100 to 450 tubers in the field for virus testing (ELISA), part of the certification process
 - Subsample of 100 tubers
 - Washing of the subsample
 - Observation of the subsample
 - Restitution of the subsample to the whole sample for virus testing (ELISA)
- Observations
 - Number of infected tubers
 - Severity of the attacks

Rhizoctonia solani



Spongospora subterranea



Streptomyces sp.:

- Superficial common scab
- Deep pitted common scab



Score 1- 3

Score 5

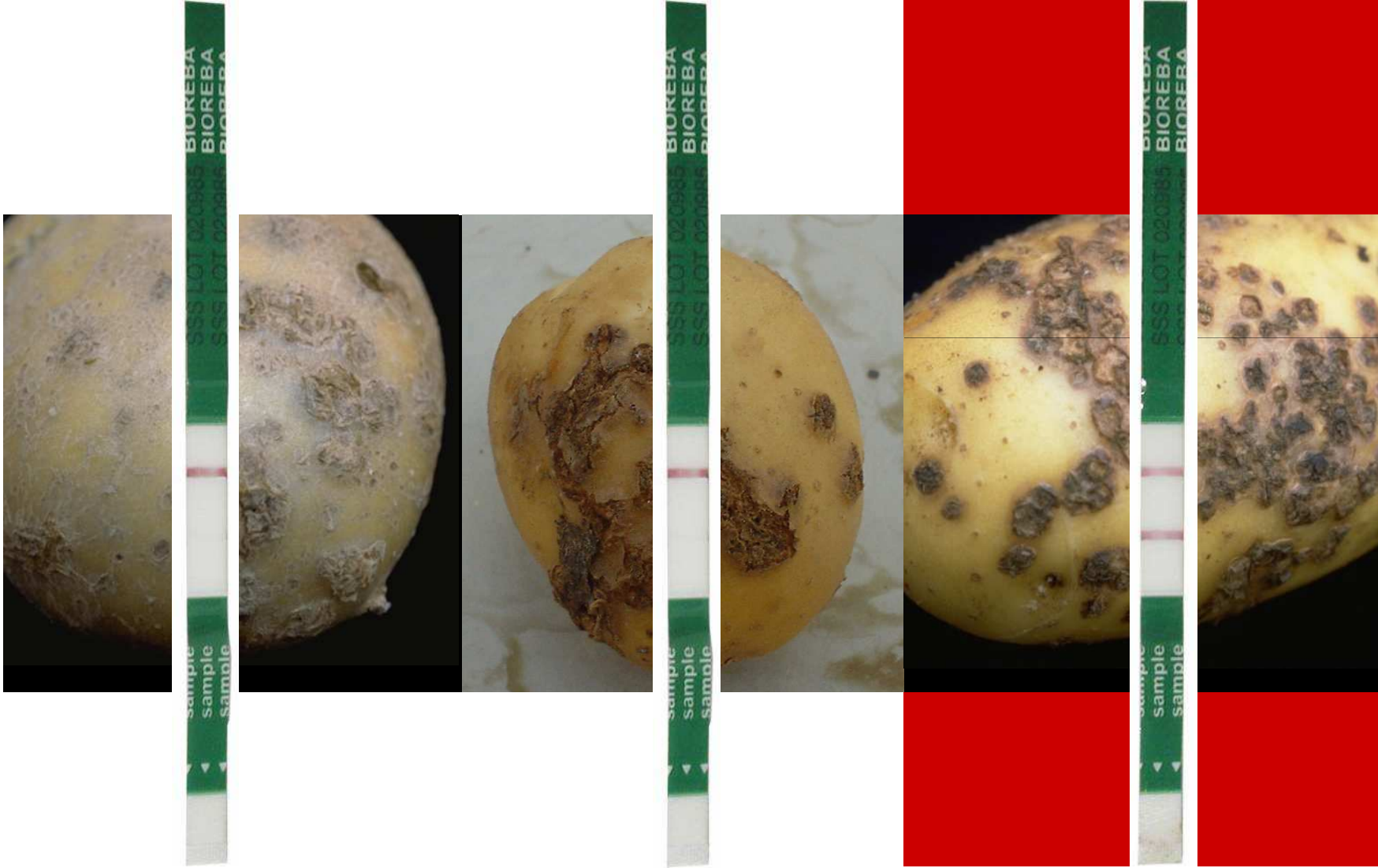
Score 7

Score 9



Identification of the pathogen: AgriStrip of Bioreba

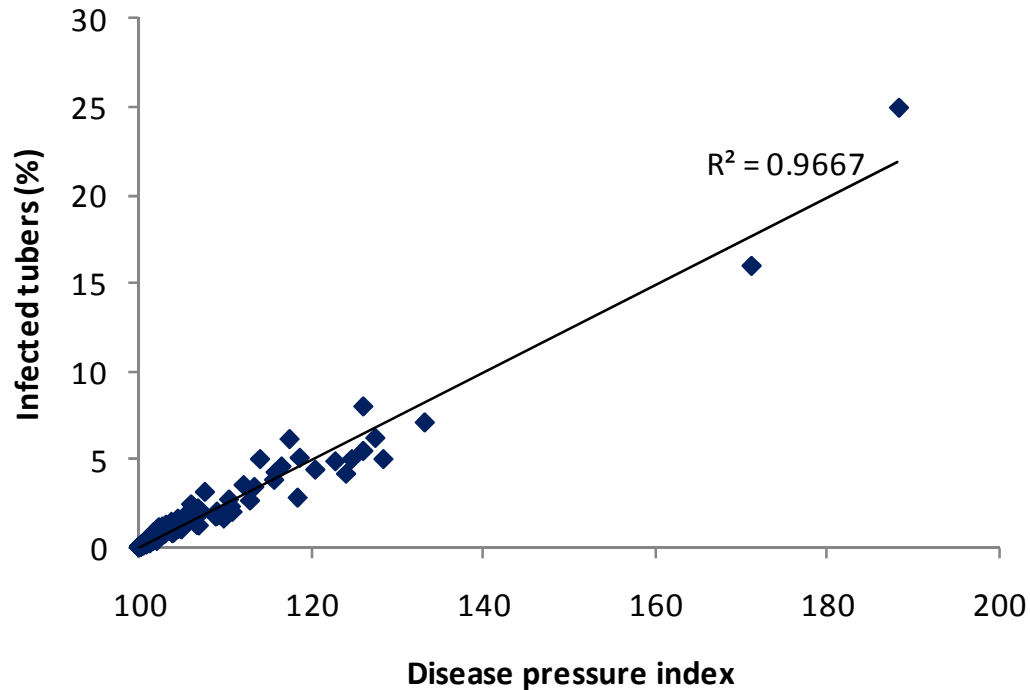
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Results: disease pressure index and percentage of infected tubers

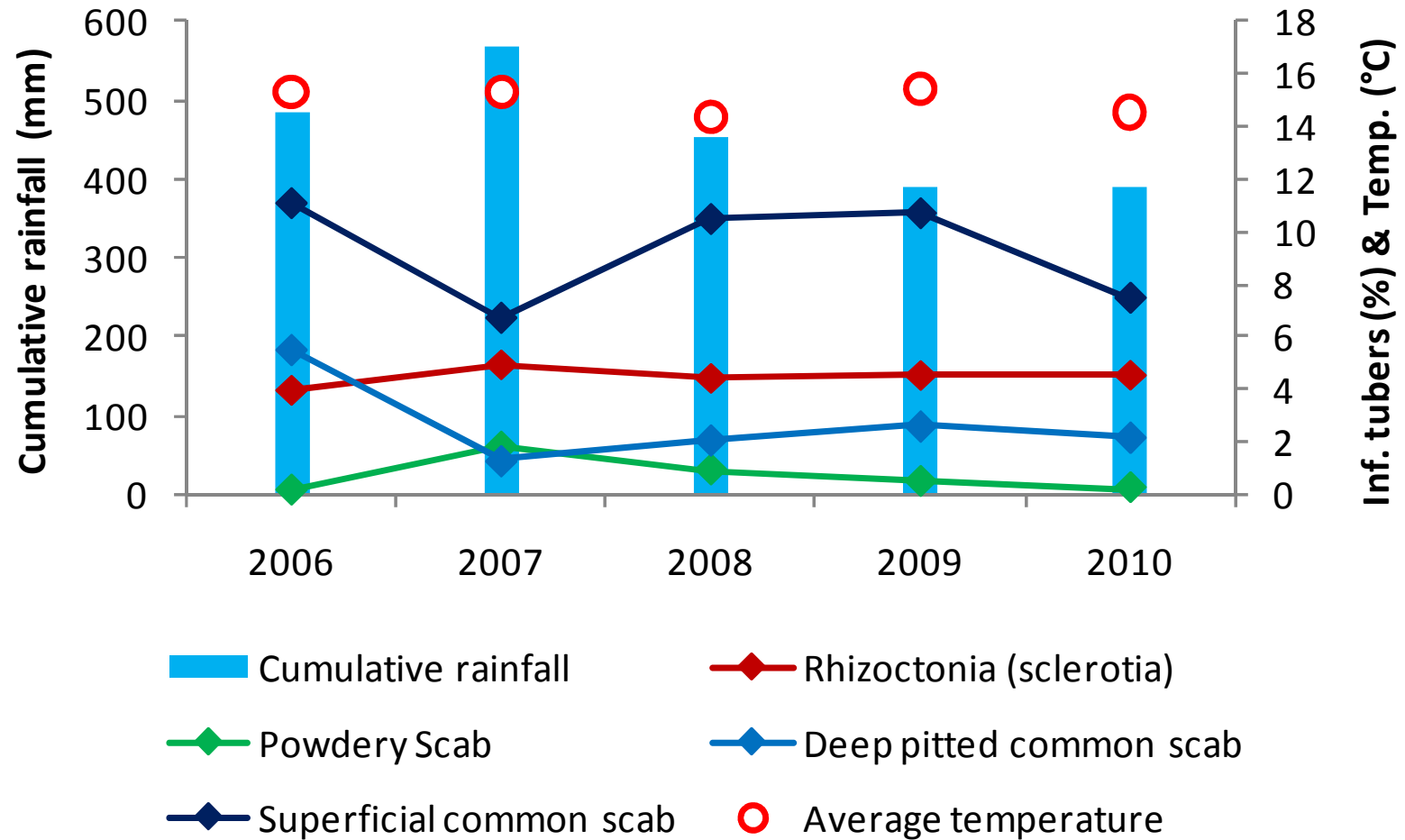
- Disease pressure index = $\sum (\text{score} * \text{nb. tubers})$



- Good correlation between disease pressure index and percentage of infected tubers

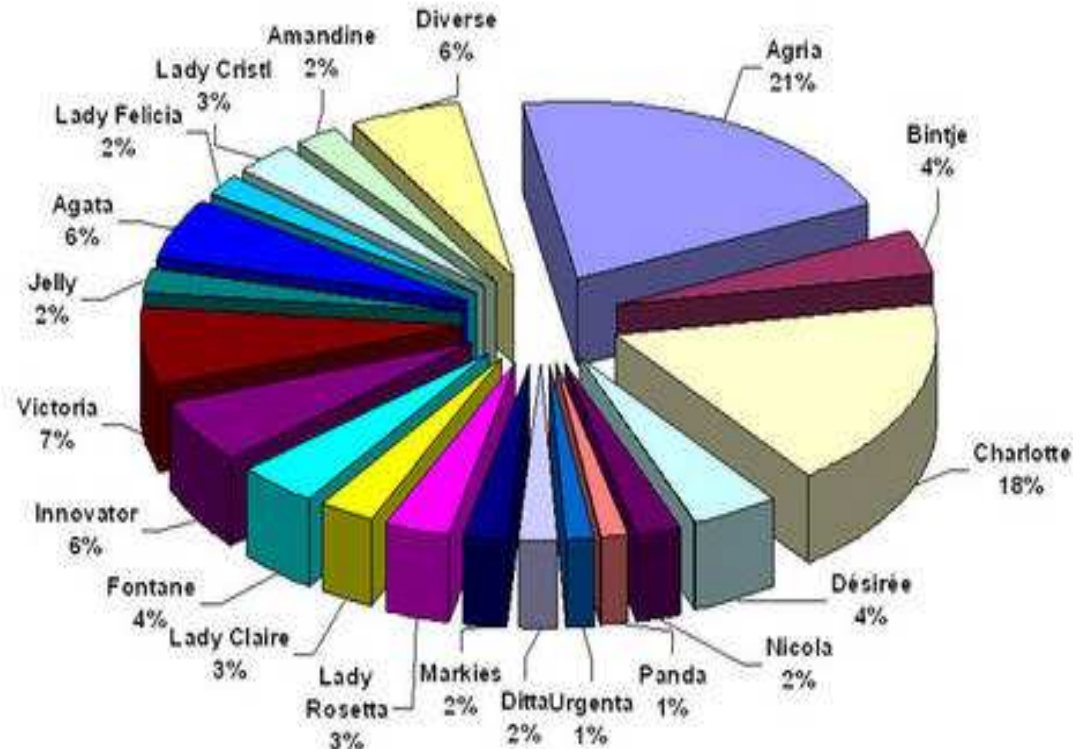


Results: relative importance of the diseases





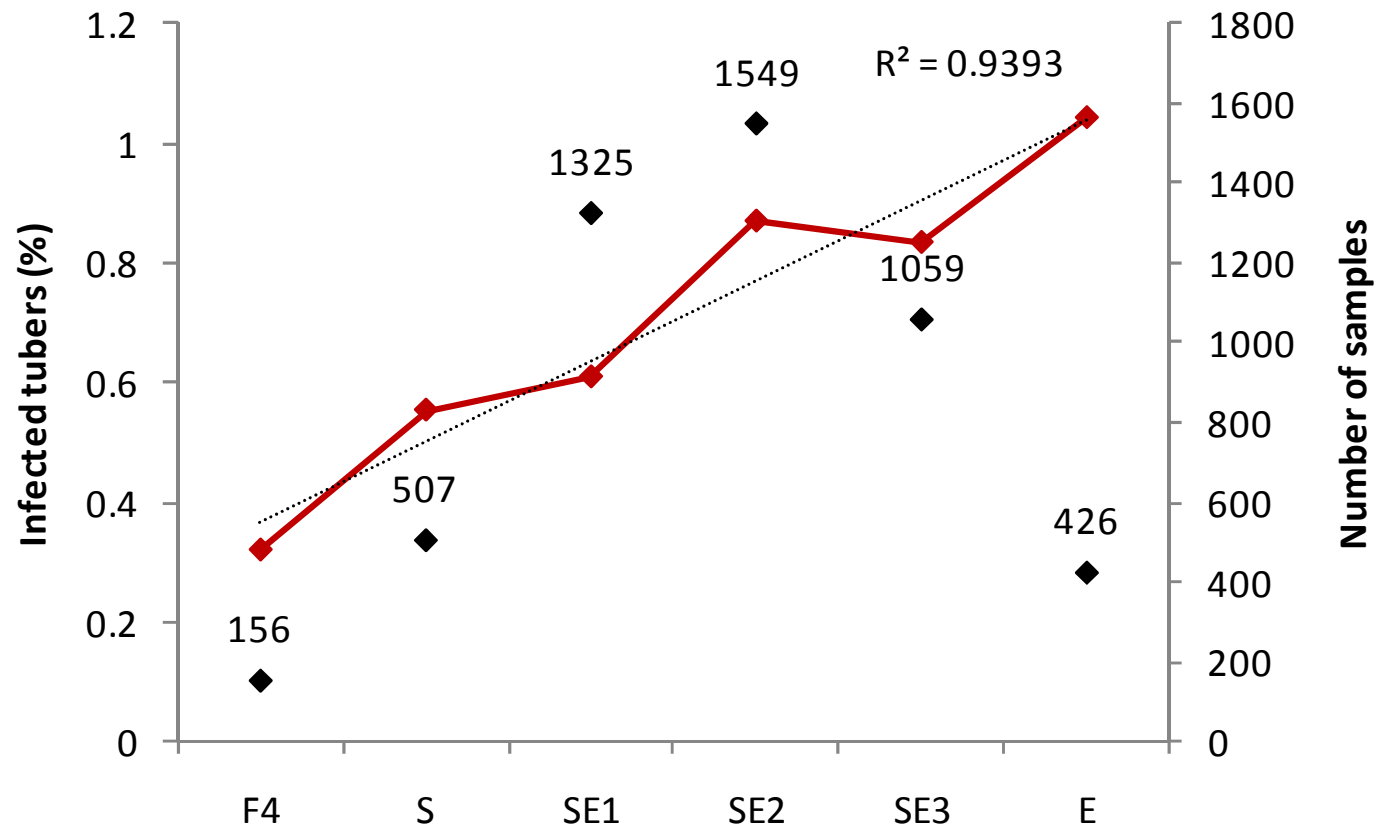
Results: cultivar susceptibility



- Susceptible varieties:
 - Lady Christl
 - Agria
 - Lady Claire
 - Markies
- Less susceptible varieties:
 - Lady Rosetta
 - Lady Felicia
 - Innovator
 - Ditta
 - Désirée



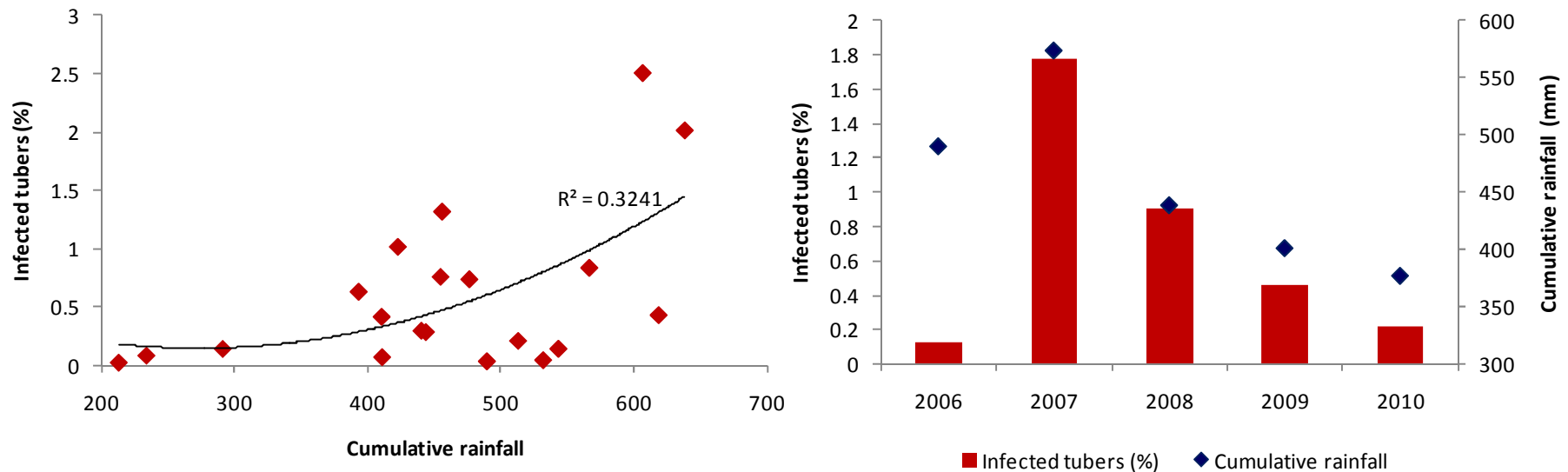
Results: impact of the generation



- The generation of the mother seed lot seems to have an influence on the symptoms observed on the progeny tubers



Results: influence of rainfall of the year

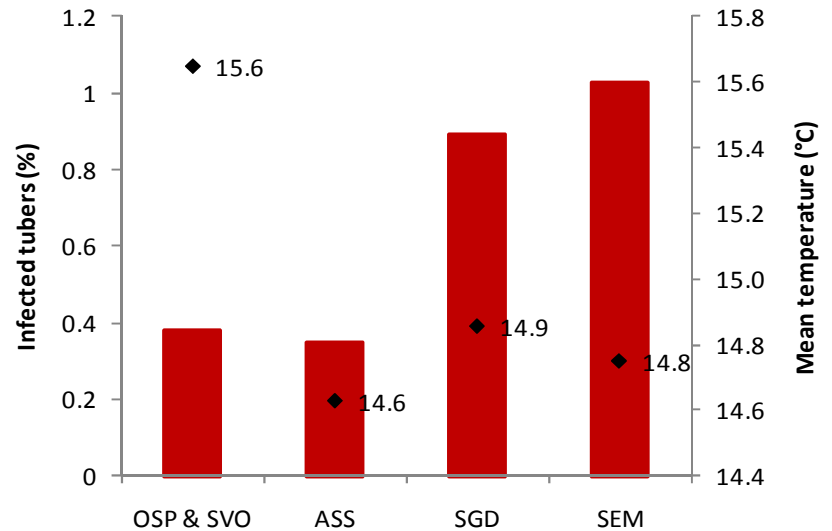
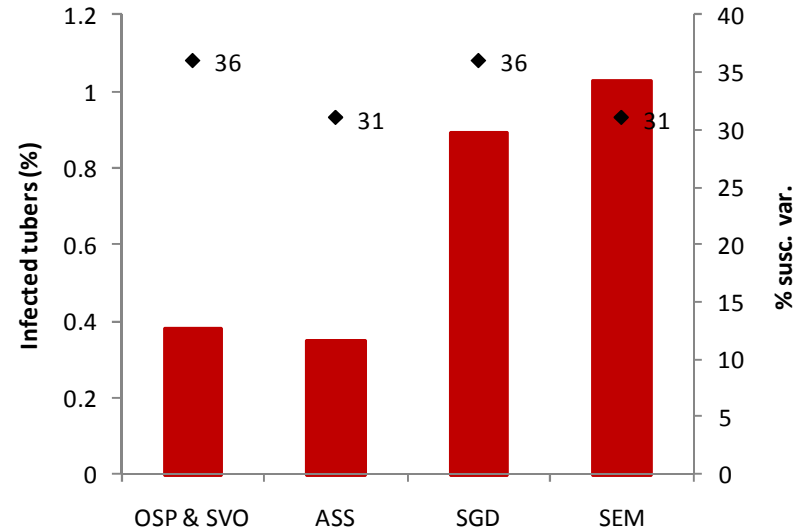
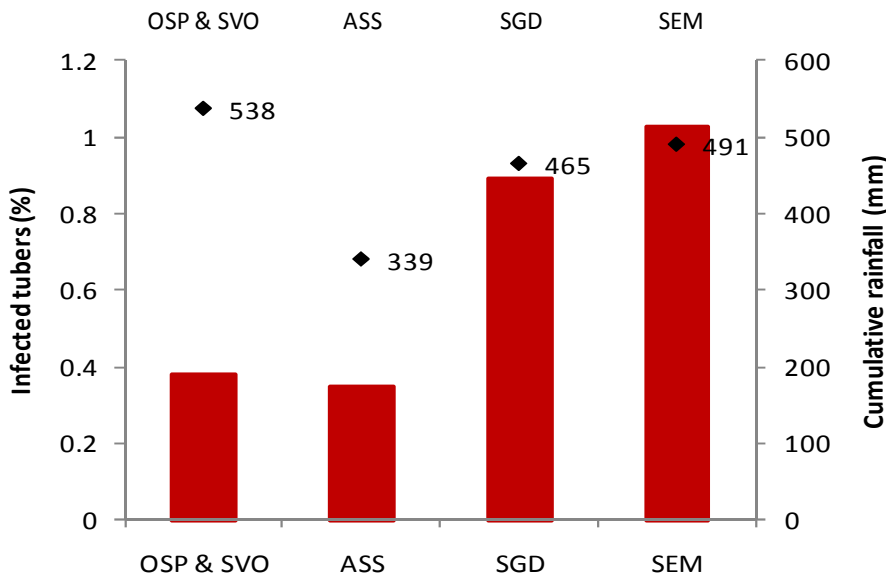


- Low correlation between rainfall (April-August) in the area and the status of the *Spongospora* prevalence for each year and each area
 - Infected tubers (%): $R^2 = 0,3241$
 - Disease pressure index: $R^2 = 0,3621$
- Atypical situation in 2006 (maybe due to the bias induced by the choice of the weather stations)



Results: influence of the location

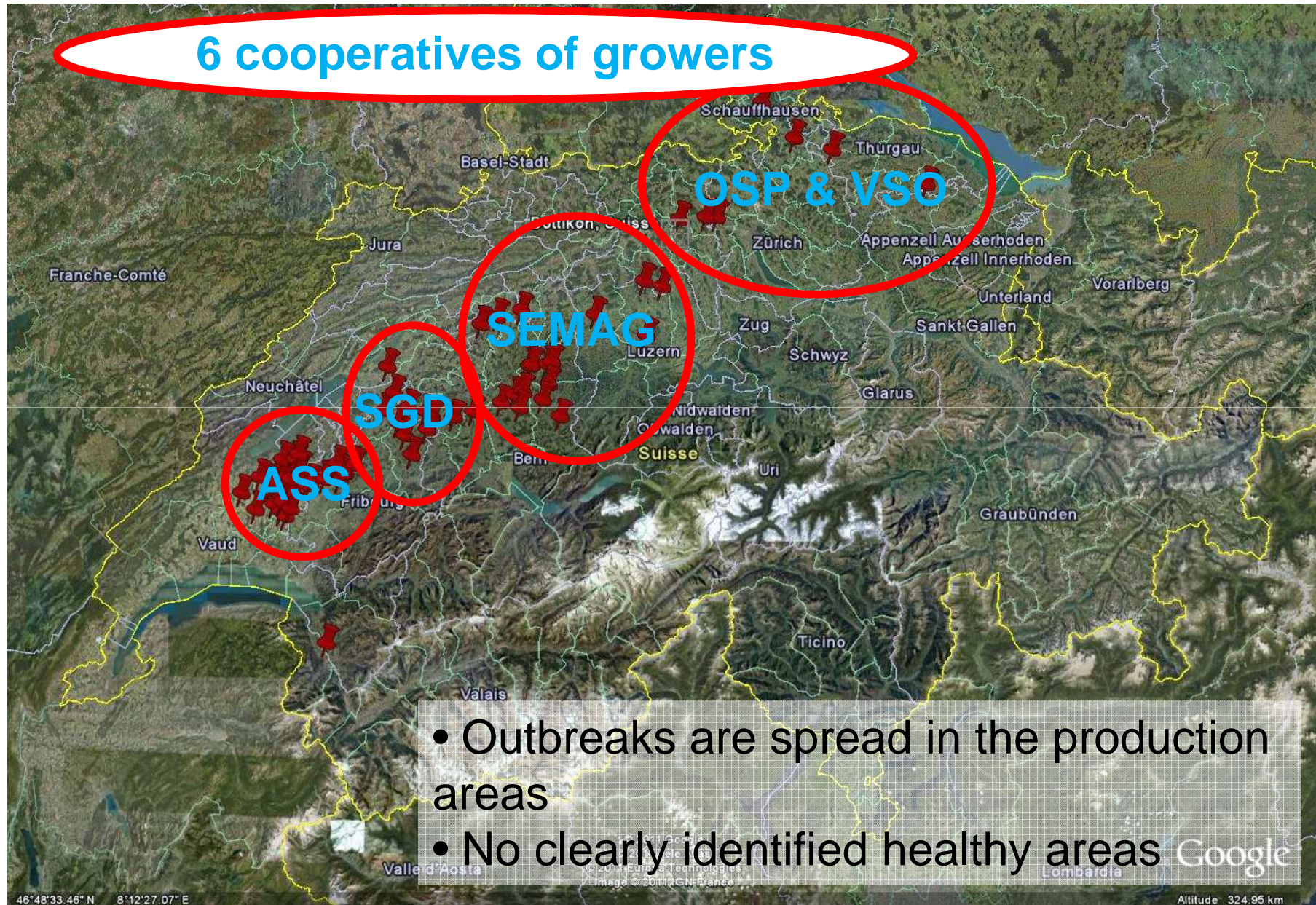
- SGD and SEM seems to be more infected
- No clear relation with the cultivated varieties, rainfall and temperature
- In SGD and SEM area, seed potato production is associated with ware potato production





Results: Infection outbreaks

6 cooperatives of growers



- Outbreaks are spread in the production areas
- No clearly identified healthy areas

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Thank you for your attention

