

Fire in your garden; Botrytis in tulips

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Applied Plant Research; Wageningen University and Research Centre
Flowerbulbs, Nurserystock & Fruits



APPLIED PLANT RESEARCH
WAGENINGEN UR



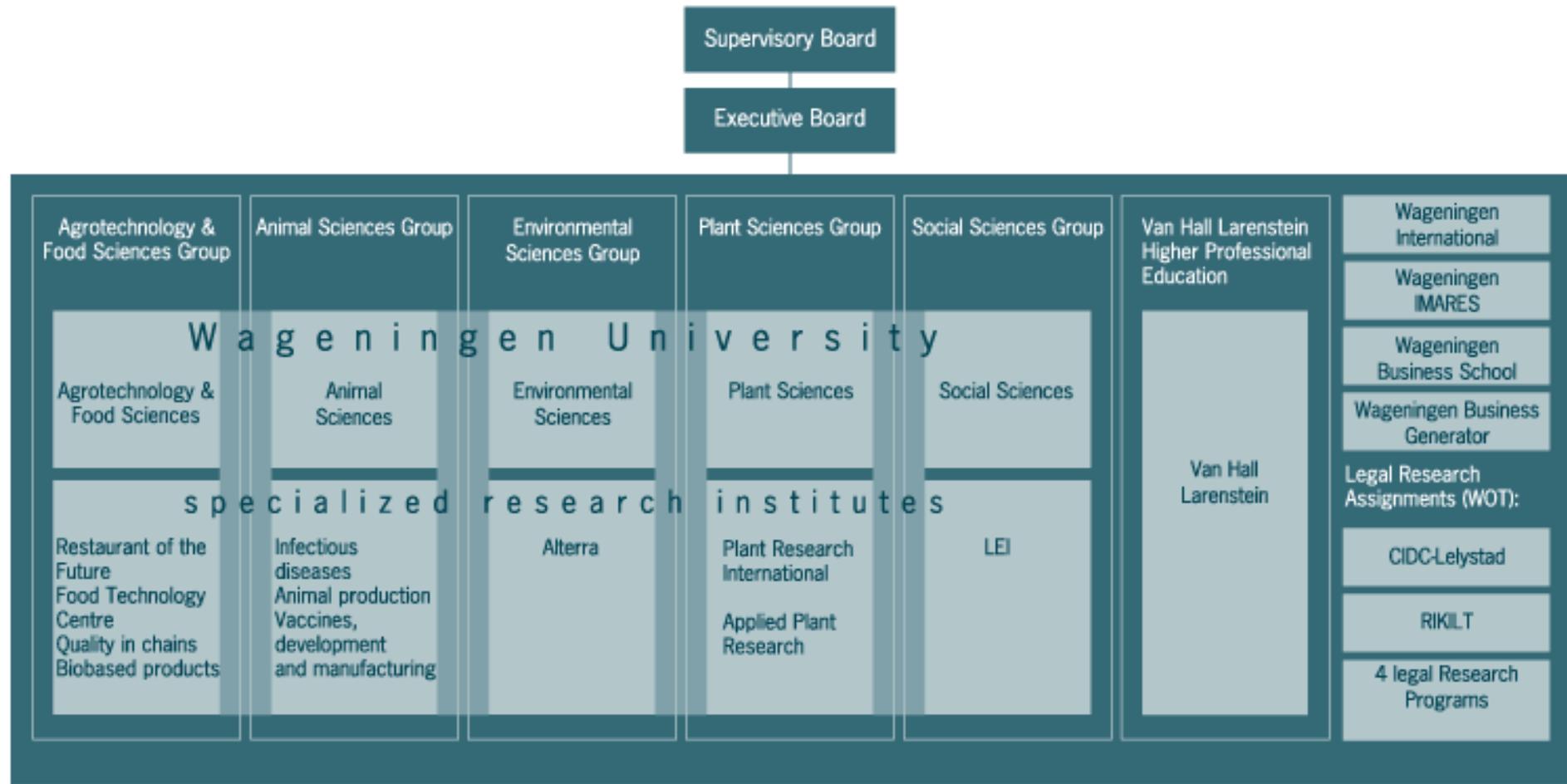
Dr. Marjan de Boer

Crop Protection and Diagnostics

Senior scientist; Integrated management of fungal diseases and weeds, Restriction of emission of pesticides



Wageningen University and Research Centre



Plant Sciences Group

Wageningen University
Plant Sciences

Plant Research
International

Applied Plant Research

Fundamental

Strategic

Applied



WAGENINGEN UR

For quality of life

Research Units Applied Plant Research

- Flowerbulbs, Nursery stock (trees) (Lisse) and Fruits (Randwijk)
- Floriculture and Glass house vegetables (Bleiswijk)
- Arable farming, Field production of vegetables and Rural area management (Lelystad)
- Mushrooms (Wageningen)
- Apiculture (Bees) (Wageningen)



Locations BU BBF



Knowledge centre for
ornamentals

• 't Zandrug

• Noordbroek

• Marwijksoord

• Valthermond

• Nagele

• Lelystad

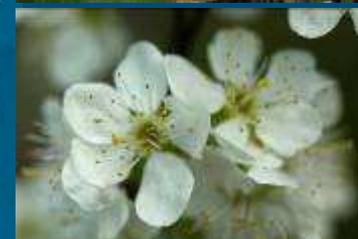
• Aalsmeer

Boskoop

• Hilv



Knowledge centre for
fruits



Research themes

- Growing (bulbs, flowers, trees, perennials, fruits) & quality
- Forcing & quality
- Propagation and breeding
- Crop protection, soil and fertilization
- Storage, energy
- Chain, logistics, packaging
- Sustainable farming and networks
- Economics and management
- International
- Urban green
- Environmental management



Today: a variety of customers & partners

- ministry of agriculture
- commodity board
- export companies
- auctions
- local government
- agrochemical industry
- horticultural suppliers
- retail (garden centers)



Knowledge for the grower

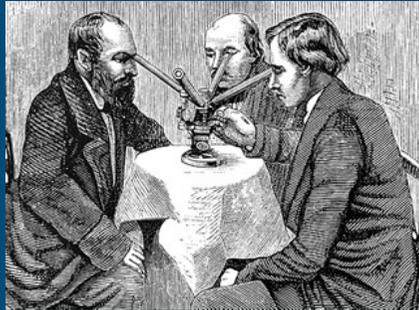
- publications (last 2.5 year >250 in specialist journals)
- Presentations for growers (last 2.5 year >150)
- Cooperation with education and advisory services
- Research reports and manuals
- Open house (6 per year)
- Communication webs for growers
- Knowledge centre



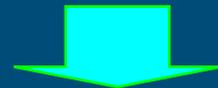
How to get to an application for growers

Growers; disease problem

Solution



Research



Fundamental research

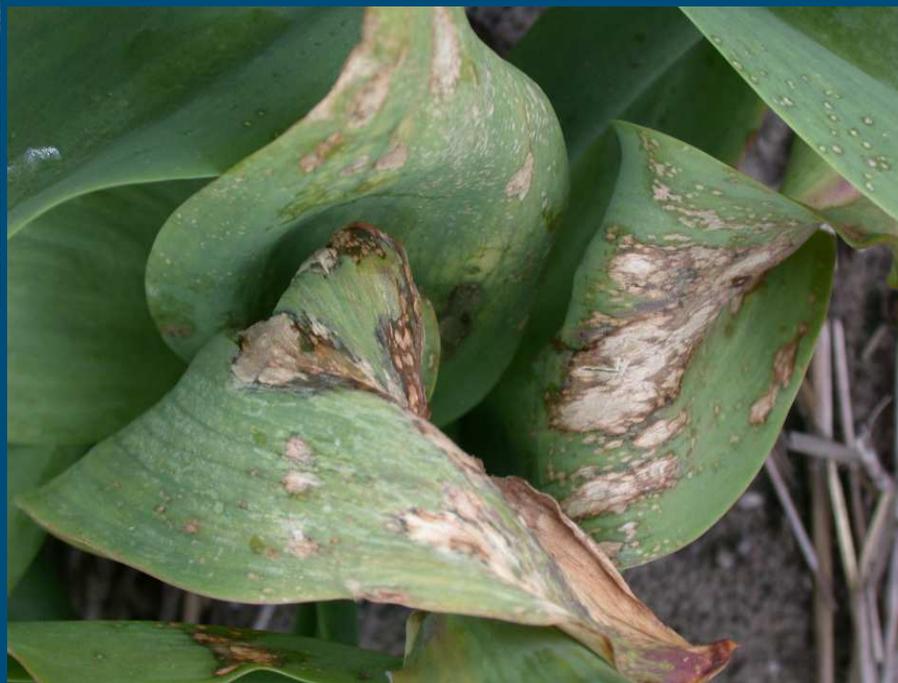
Translation to practical solution

Application on farm / Cost effectivity

Broad implementation



Botrytis in tulips; Fire in your garden



Botrytis in tulips - Symptoms

Fire Lesions

- Typical grey or greenish grey
- Variable in size and shape



Botrytis in tulips - Symptoms

Spots

- Small, dry slightly sunken and yellowish or greyish white
- On leaves and flowers in the neighbourhood of heavily infected plants



Botrytis in tulips - Symptoms

Bulb rot

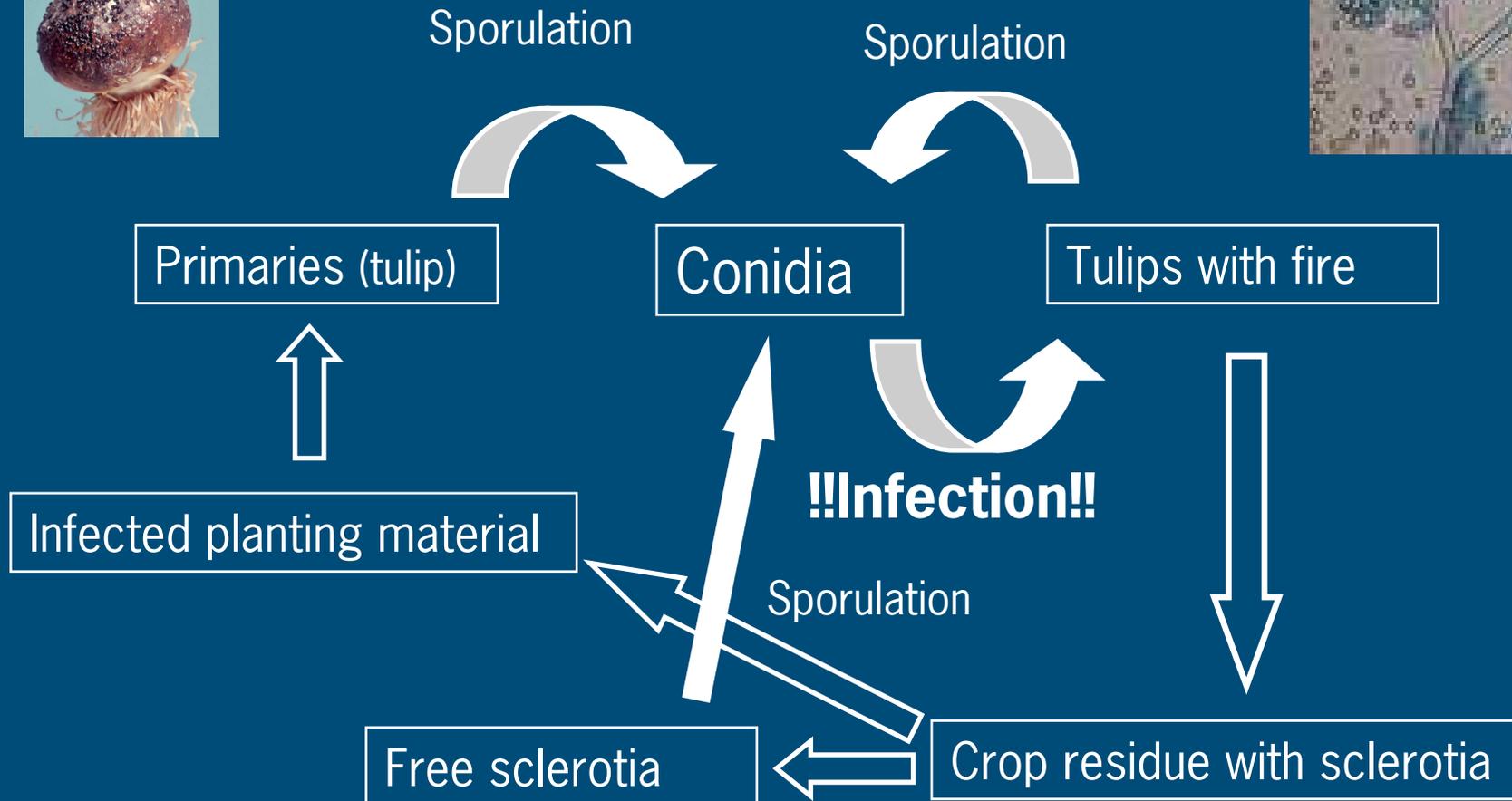
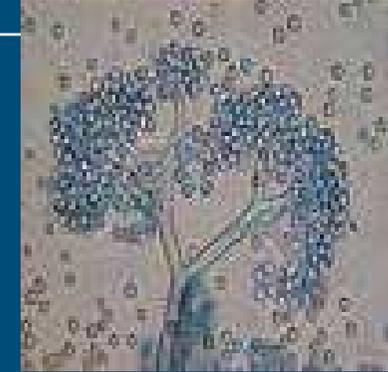
- Clear symptoms like sclerotia
- Latent infections (not visible symptoms)



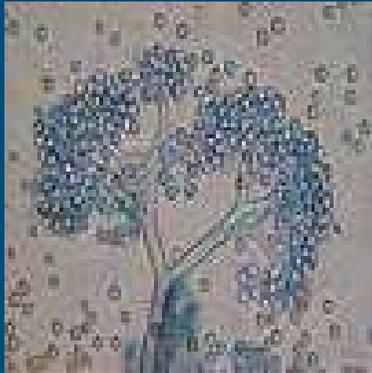
How does the fungus behave?



Life cycle *Botrytis tulipae*

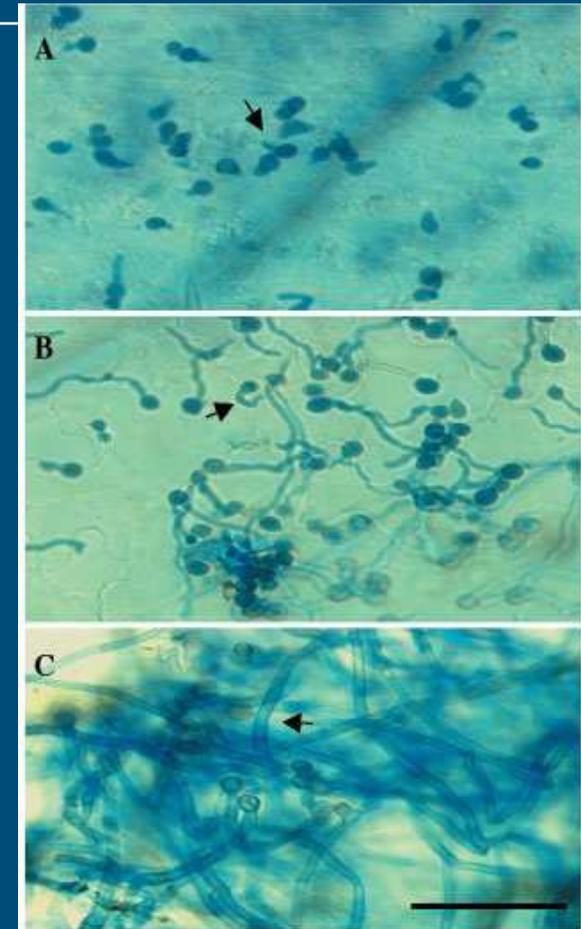


Infection circumstances



Conidia germinate at:

- Moist conditions (leaf should be 'wet')
- Temperature above 15°C (59°F)



What can you do about it?

- Plant healthy bulbs
- Avoid moist and warm places
- Do not plant tulip bulbs where tulips were growing in previous years
- There should be at least a gap of 3 years before tulips are planted in the same place



What can you do about it?



- During the season:
 - Remove diseased leaves as soon as possible
 - Dug up heavily diseased plants with bulbs and dispose carefully
 - Remove flowers when showing symptoms (spots)
- End of the season: After dying off remove the bulbs from the soil and replant in autumn at an other place
- When soil is suspected to contain Botrytis it can be deep-dug at least 20 cm



What can the commercial grower do about it

- Plant healthy bulbs
- Removal of primaries
- When necessary spray fungicides



Integrated Disease Management

Prevention

- **Detection;**
 - sampling soil/bulbs for detection
 - detection of fungi (e.g. Botrytis on the crop, early warning)
- **Healthy plant material;**
 - sort out plant material
- **Soil;**
 - good soil structure
 - soil life, soil suppressiveness
 - soil fertility
- **Production of the crop;**
 - use less sensitive crops
 - broad crop rotation
 - remove crop residues and remaining bulbs from the soil



Integrated Disease Management

Control

■ Healthy plant material;

- hot water treatment against nematodes, insects and fungi
- “cleaning” the outside of the bulb with environmental friendly, easy degradable products (against fungi)

■ Soil;

- use of biofumigation crops
- rotation with specific pre-crops
- biological soil disinfestation
- flooding

■ Pesticides;

- Chemical pesticides
- Decision Support System (Botrytis Warning System)
- Use of spraying methods with less emission
- Pesticides of natural origin
- Biologicals
- Compatibility of biological control methods with pesticides



Example IPM against Botrytis

Improving and combining of:

- Crop residue management
- Plant density
- Cultivar selection
- (N-) fertilization
- Botrytis Warning System
- Biocontrol agents / PNO
- Fungicides (compatibility with biocontrol agents)



Thank you

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