

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**



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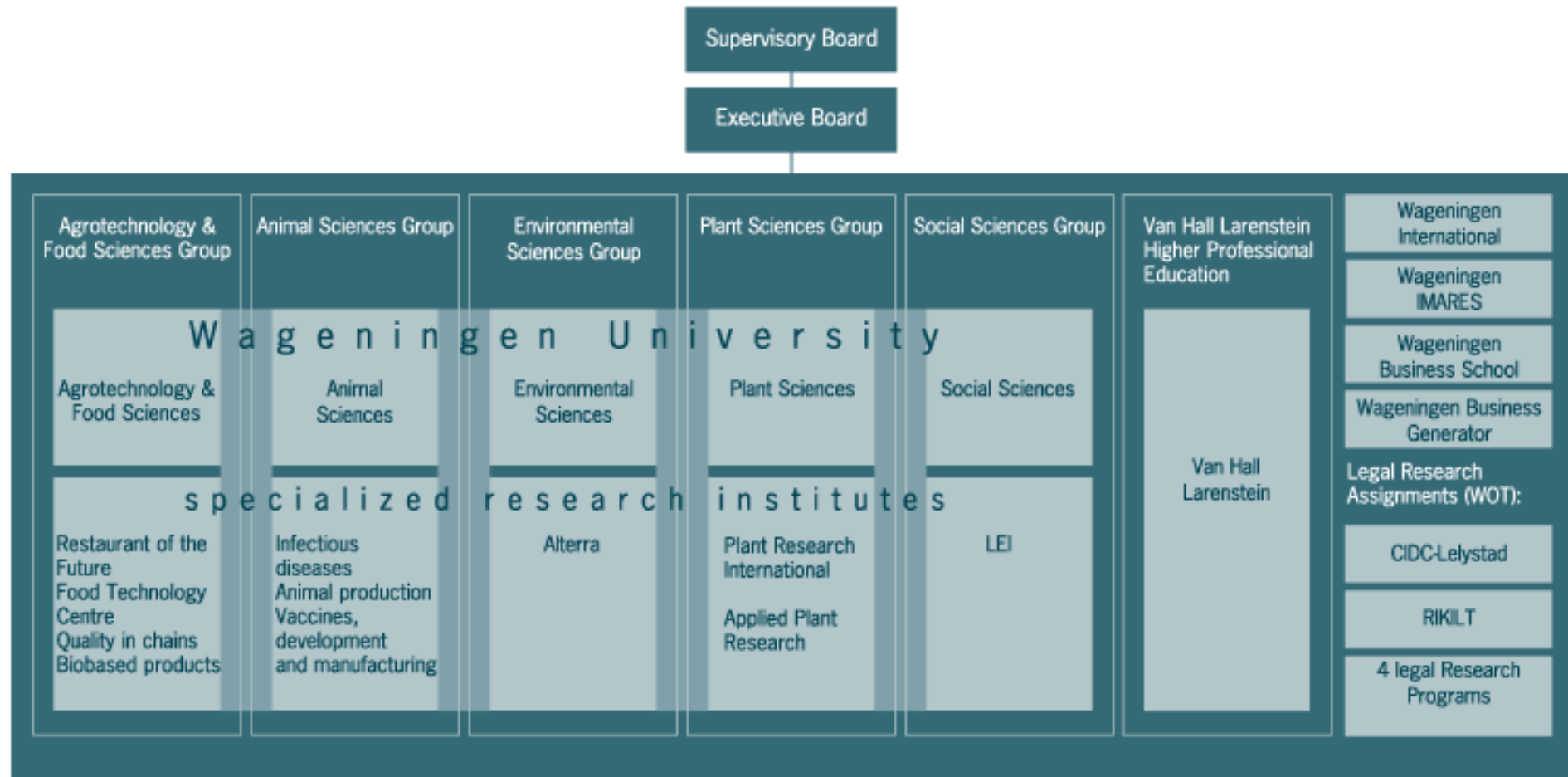
Crop Protection and Diagnostics

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



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Plant Sciences Group



Wageningen University
Plant Sciences



Plant Research
International



Applied Plant Research

Fundamental

Strategic

Applied



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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



Knowledge centre for
fruits



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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



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Botrytis in tulips; Fire in your garden



Botrytis in tulips - Symptoms

Fire Lesions

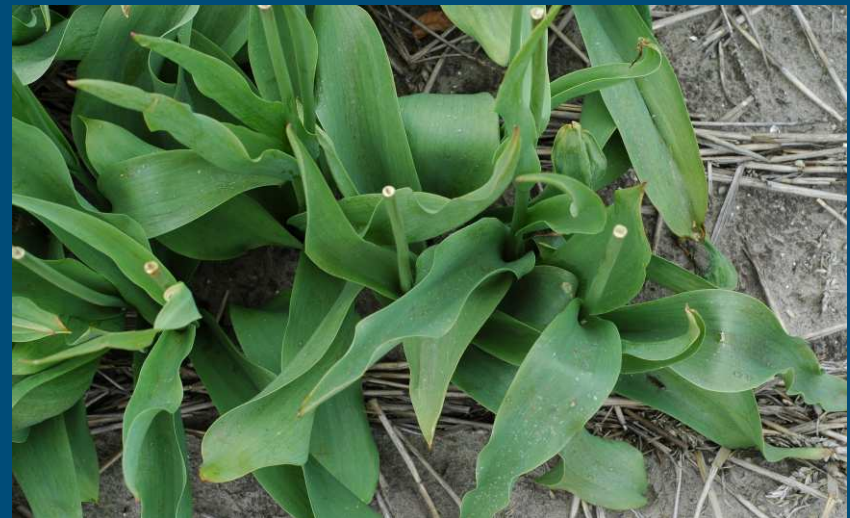
- Typical grey or greenish grey
- Variable in size and shape



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

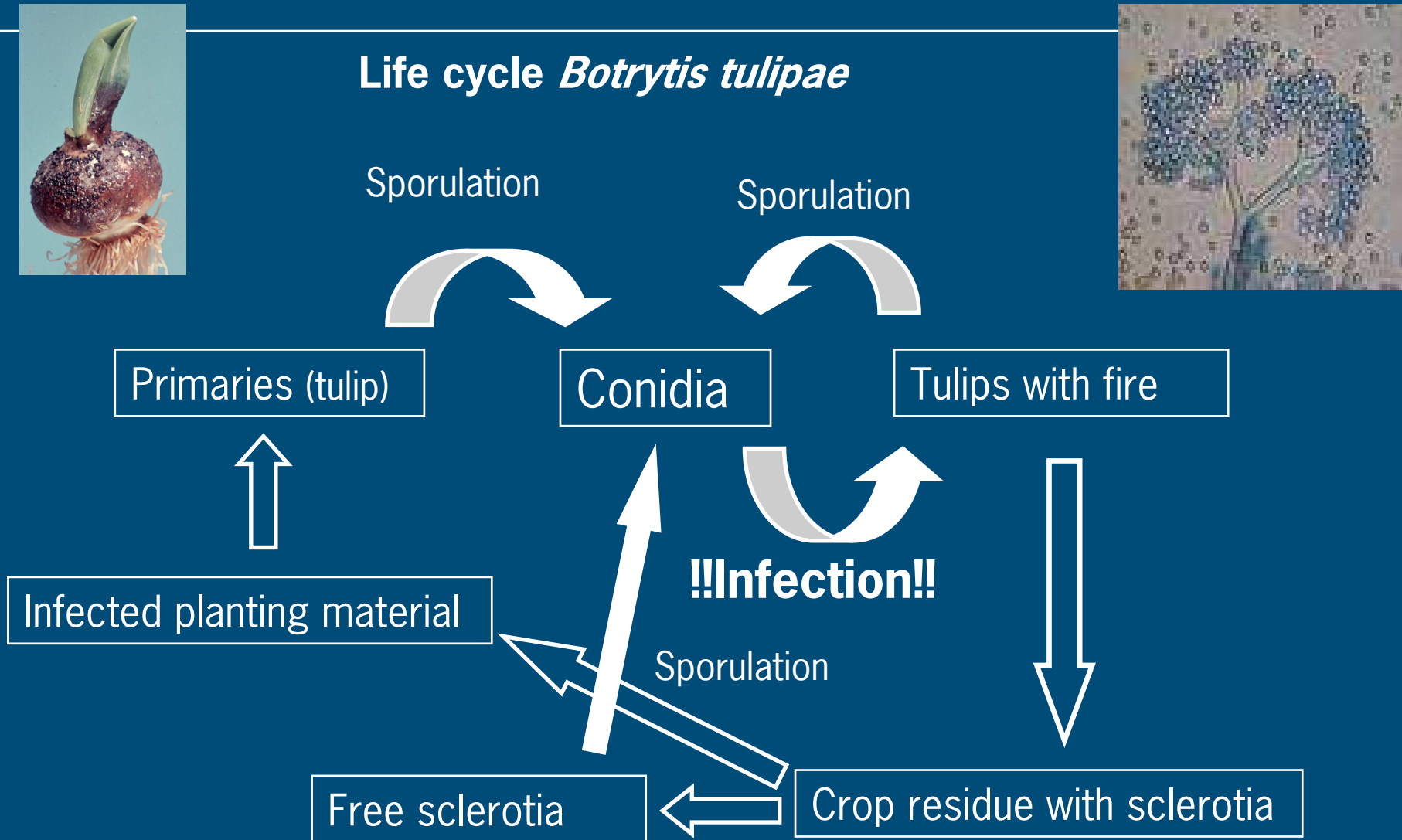
Bulb rot

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

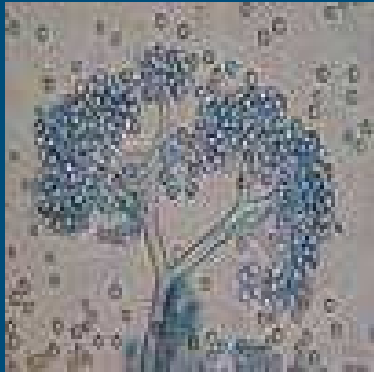


How does the fungus behave?

Life cycle *Botrytis tulipae*

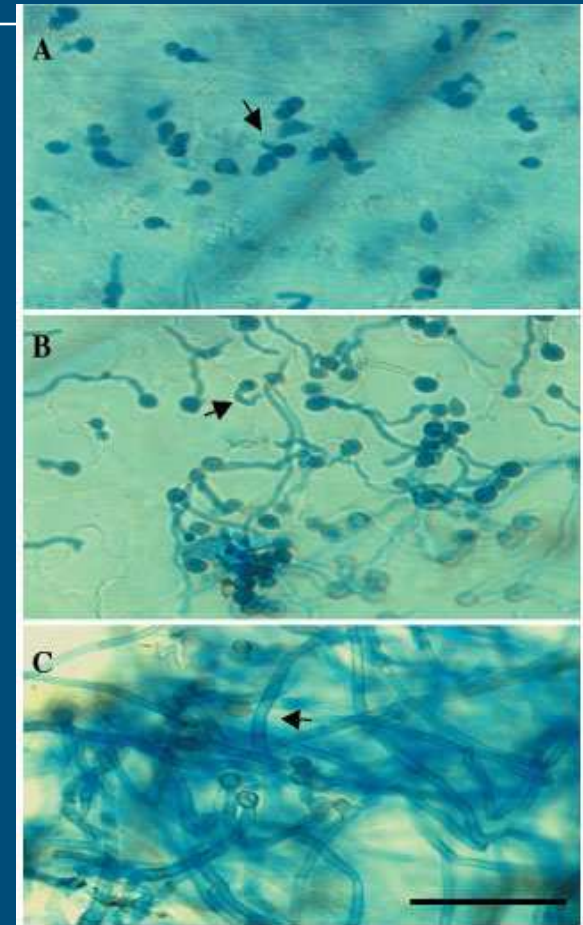


Infection circumstances



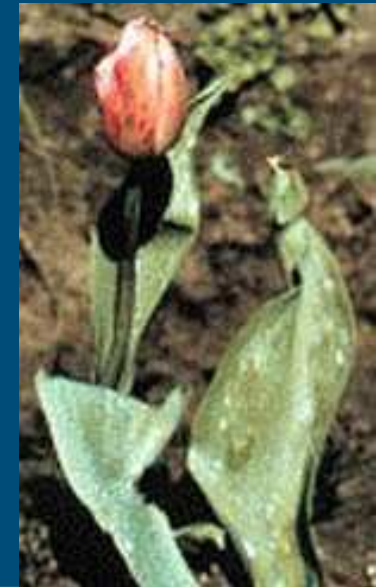
Conidia germinate at:

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

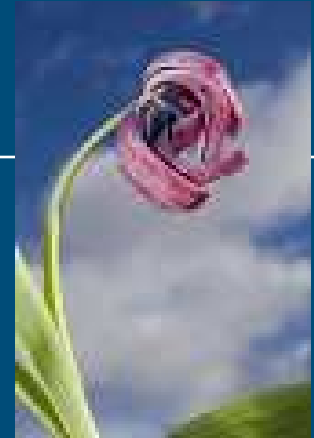


What can you do about it?

- 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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