The emergence of new plant pathogens:

Stemphylium in Dutch sugar beet production

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KNPV najaarsbijeenkomst 'The Process to Progress'

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Content

- symptoms
- spread
- identification
- damage
- solutions

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Foliar diseases in sugar beet

Powdery mildew (*Erysiphe betae*)

- **damage 5-10%**

Rust (*Uromyces betae*)

- **damage 5-10%**

Ramularia (*Ramularia beticola*)

- **damage 10-15%**

Cercospora (*Cercospora beticola*)

- **damage 40%**

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Symptoms (1)

- **irregular yellow spots (0.5-2 mm) older spots brownish and big (1-3 cm)**
- **necrotised tissue inside yellow spot**
- **spread over leaves by new infections**

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Symptoms (2)

Spread (1)

- first samples to IRS diagnostic service in 2007
- initially sandy and reclaimed peat soils (east)
  - typical crop rotation north east:
    - ¼ sugar beet
    - ¼ barley
    - ½ (starch) potato
    - occasionally mais, wheat, lily, carrot
- south east: diverse crop rotations with potato, lily, mais, vegetables

Spread (2)

2007-2013: fast spread over the whole country

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Identification (1)

- no bacterial cause
- no viruses found by electron microscopy

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Identification (2)

nutrient deficiency field trial 2008:

Treatment	Score
Untreated	4.1
Magnesium (25 kg/ha Epso Top)	4.0
Manganese (1.5 l/ha TopTrace)	3.8
Nitrogen (25 kg N/ha UAN)	3.8

Score on a scale 1-10; 1 = sugar beet dead; 10 = no yellow spots

Symptoms not caused by nutrient deficiency!

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Identification (3)

- fungicide field trials (2008, 2010, 2011, 2012) gave good results
- stemphylium and alternaria isolated from leaf spots

boscalid + epoxiconazole

untreated

u = unavailable (not registered)

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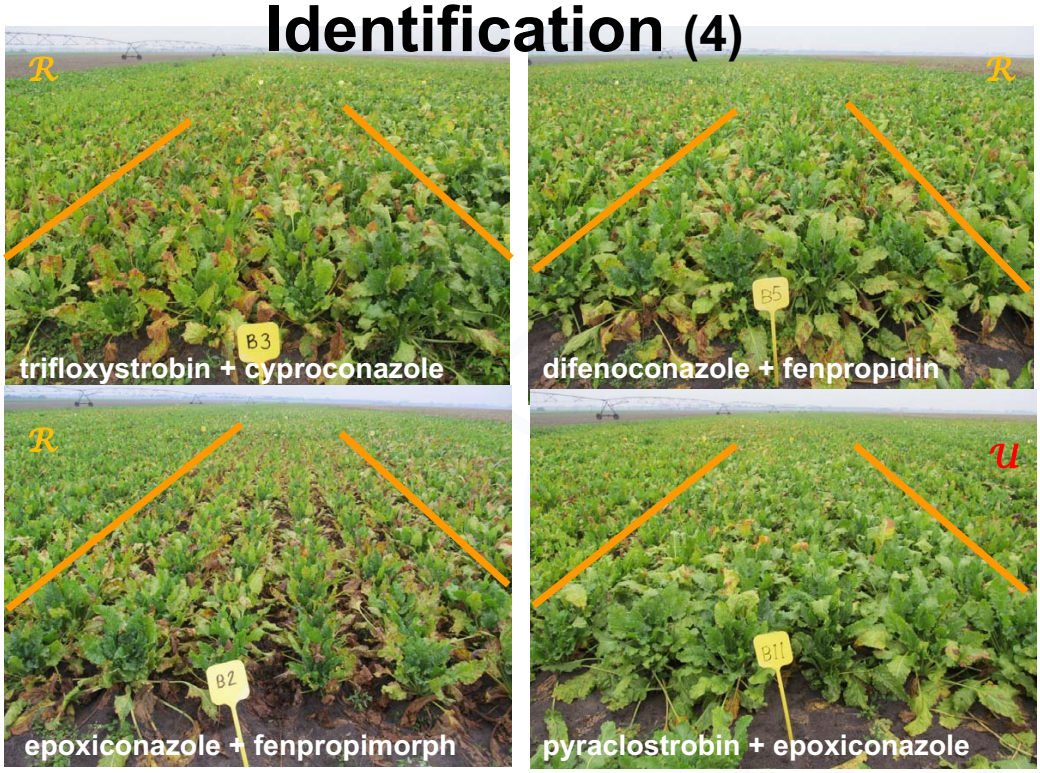
Identification (4)



R = registered for sugar beet
U = unavailable (not registered)

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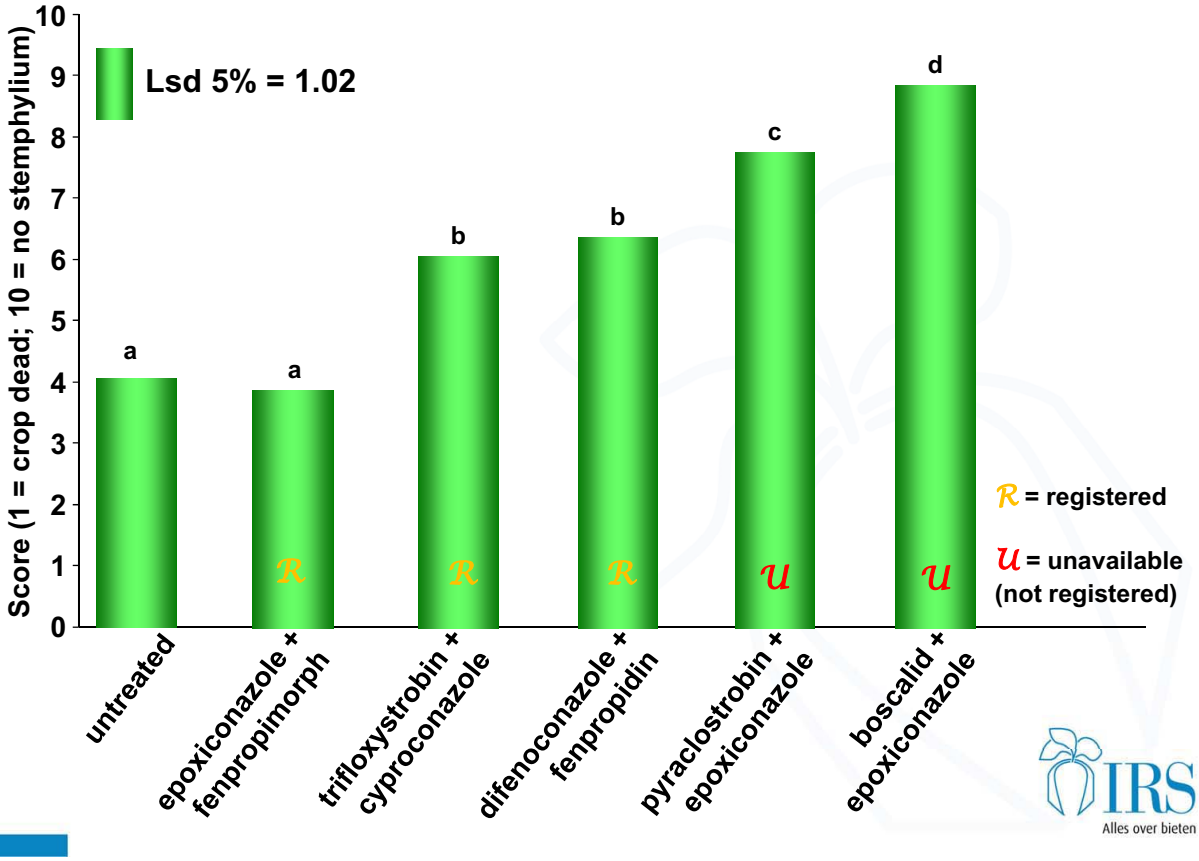
Fungicide efficacy trials 2012



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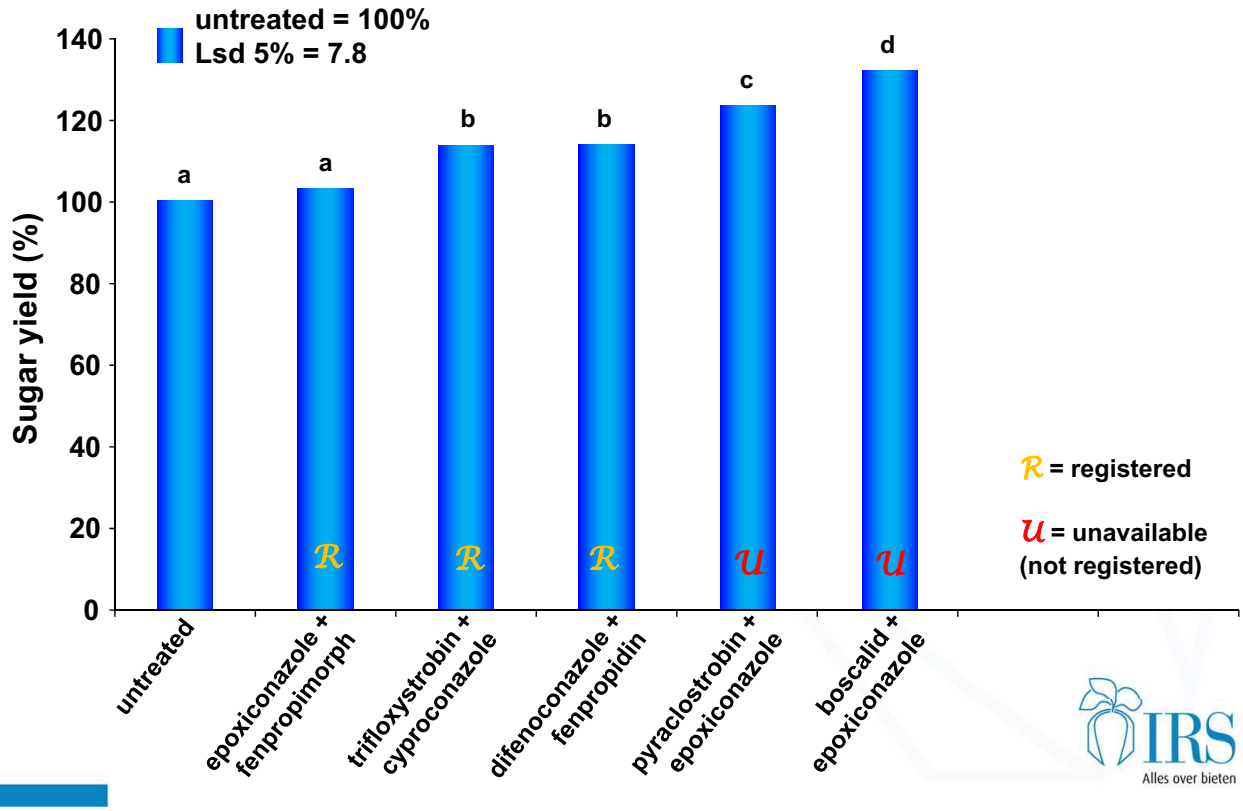
Fungicide efficacy trials 2012



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Damage (1)

Financial yield loss in field trials with fungicides: (untreated vs. best fungicide)

Year	Financial yield loss (%)
2008	18.8
2010	8.8
2011	11.2
2012 (I)	51.3
2012 (II)	26.4

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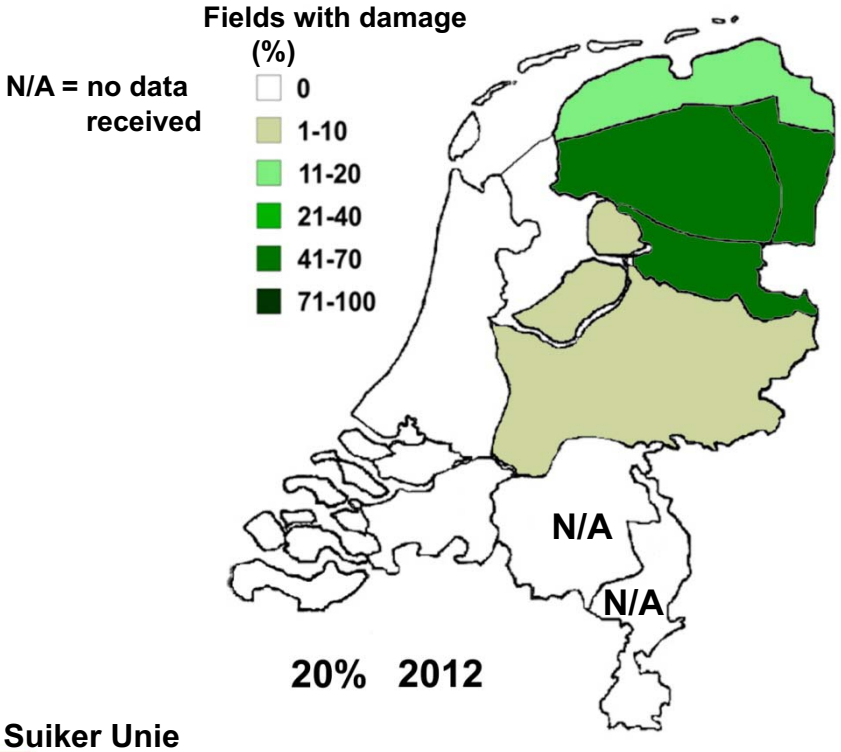
Damage (2)

Occurence of stemphylium in 2012



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Identification (5)

- isolated from spots :
  - *Alternaria alternata*
  - stemphylium
- reproduce symptoms in climate rooms



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Identification (6)

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Putative hosts- climate room

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Putative hosts

- non-hosts
  - *Lolium perenne*
  - *Solanum niger*
- hosts
  - *Solanum tuberosum*
  - *Chenopodium album*
  - *Sinapis alba*
  - *Spinacia oleracea*
- question marks
  - *Allium cepa*
  - *Raphanus sativus subsp. oleiferus*

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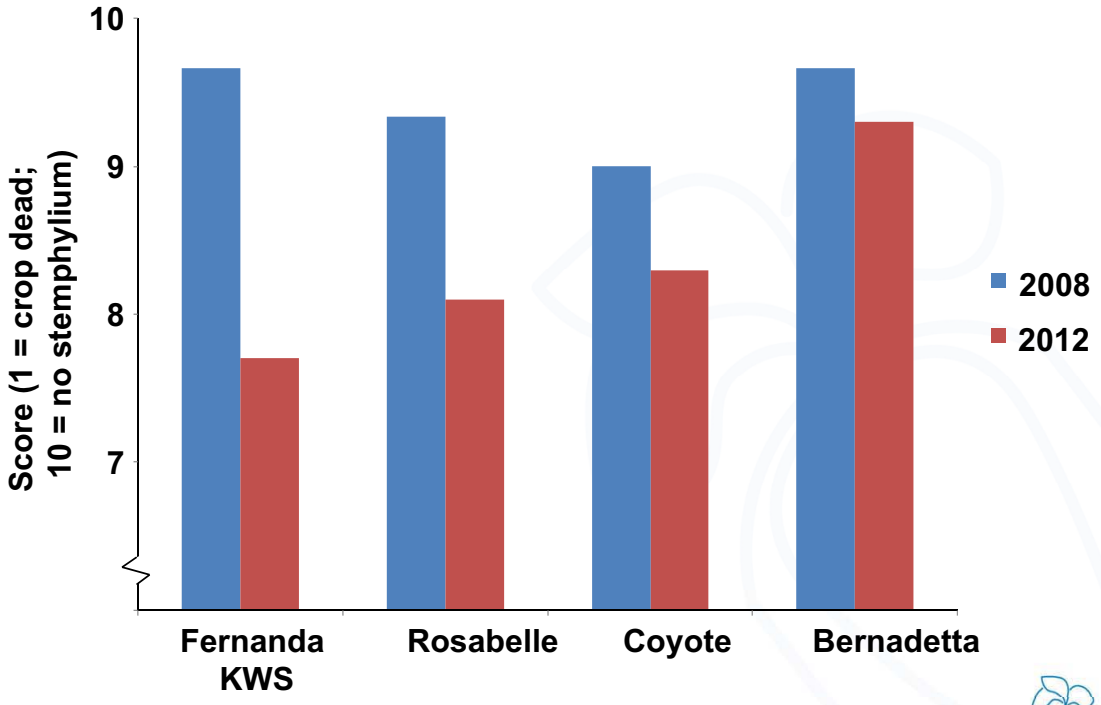
Varieties



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Conclusions

Stemphylium:

- **is the cause of the yellow leaf spot disease**
- **causes considerable damage**
- **spreads quickly over regions**
- **can be controlled by just-in-time applications of suitable fungicide(s)**

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IRS

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Thank you for your attention!