Sclerotinia in horticultural crops – integrated management

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Peracto
Knowledge through Experience

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Know-how for Horticulture™

Vegetable R&D

Sclerotinia sclerotiorum

Sclerotinia minor

Managing Sclerotinia diseases 1997-2007

- Short term during crop period
  - Agronomy / crop management
  - Reduce disease conducive conditions
  - Optimise chemical control

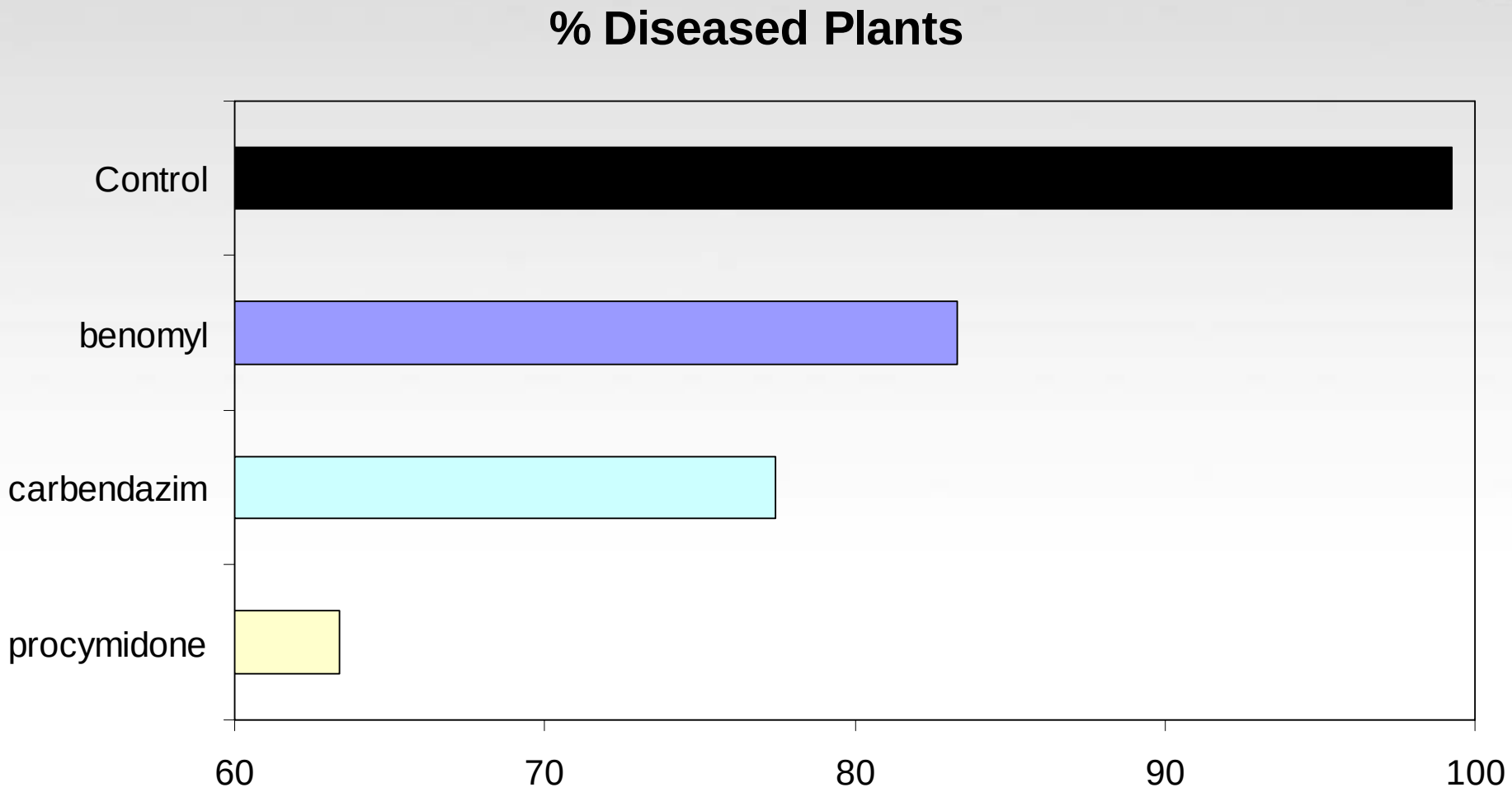
- Long term between crops
  - Pre-plant treatment - reduce sclerotia in soil
  - Crop rotations, biofumigant crops - break disease cycle
  - Soil health - microbial diversity, soil structure

Sclerotinia control during bean crops

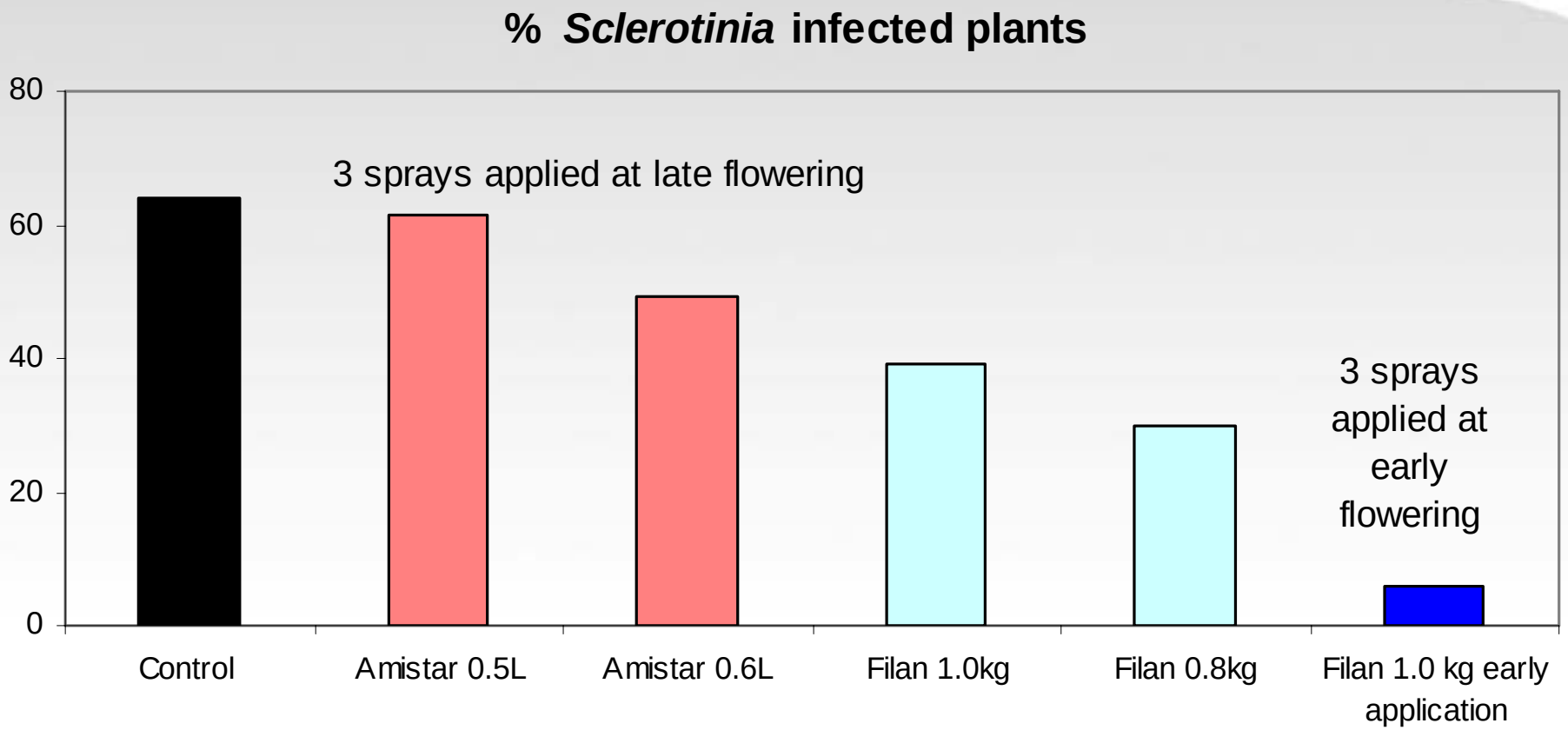
- ✓ **Optimising Chemical control (1997-2000)**
  - Fungicide selection
  - Fungicide resistance
  - Application methods
  - Water volume ?
  - Surfactants / Stickers ?

Fungicide efficacies under high disease pressure

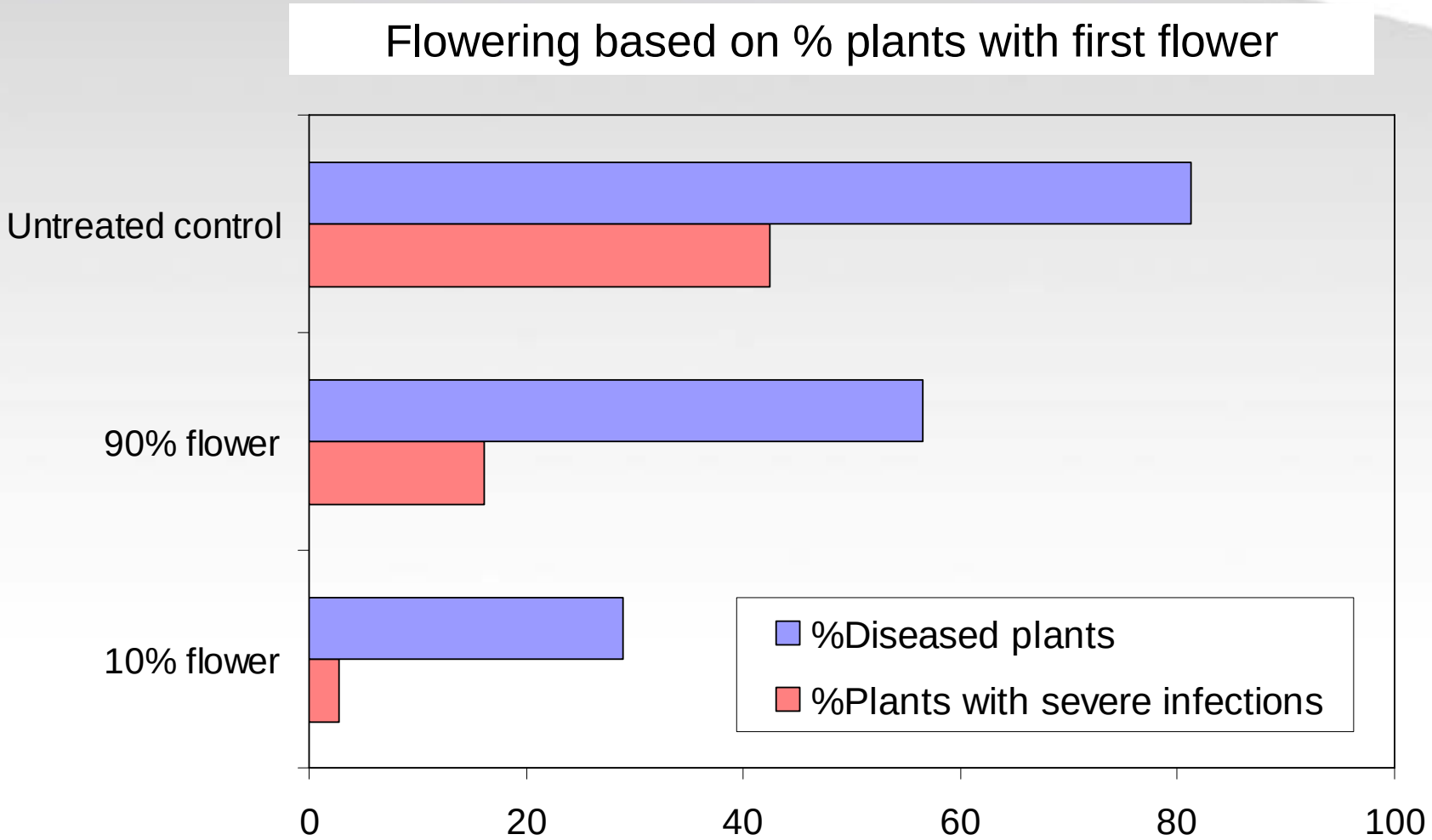
1997 to 2000 - procymidone most effective fungicide



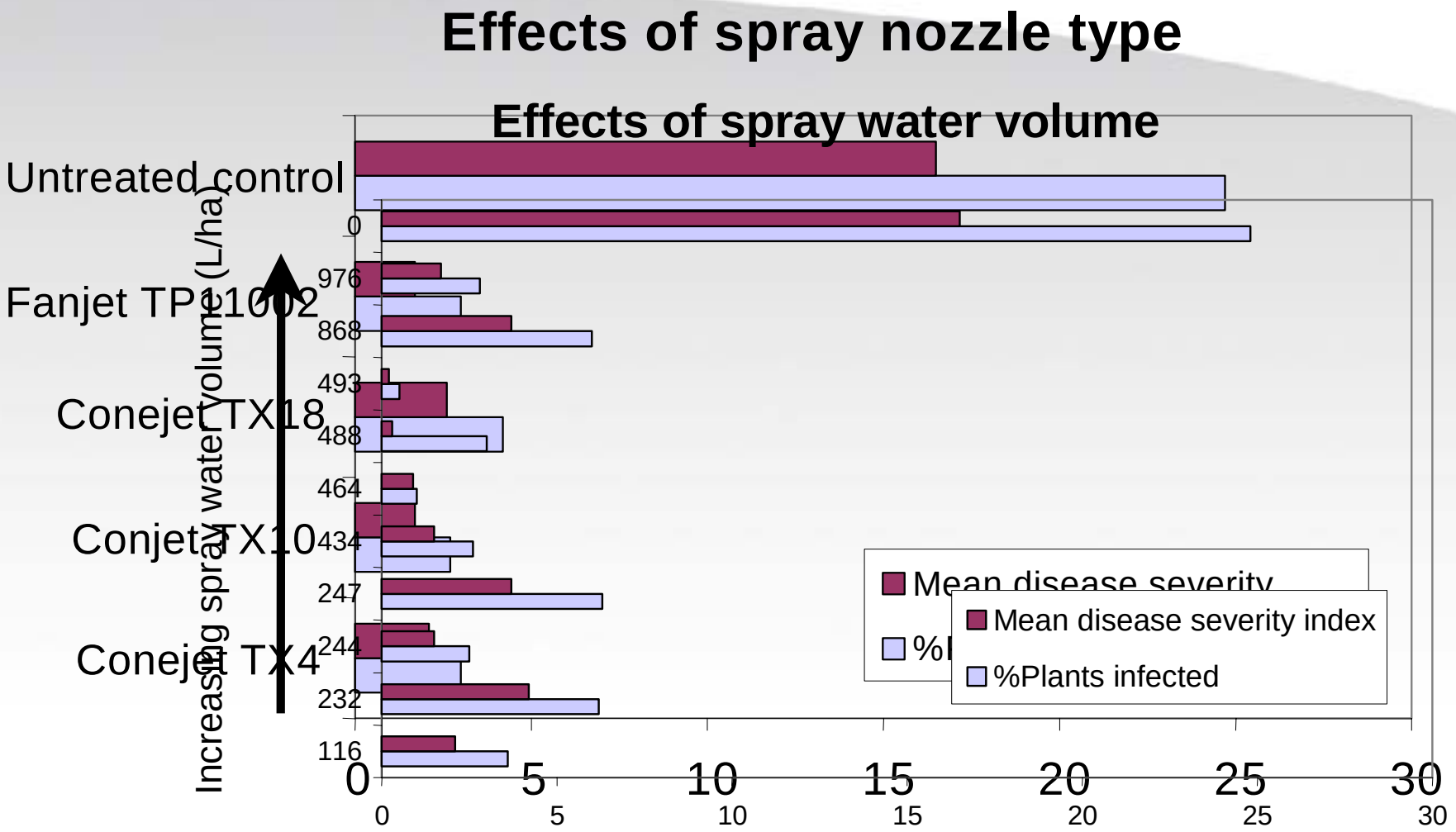
Timing of applications
Merseylea, Tasmania 2005



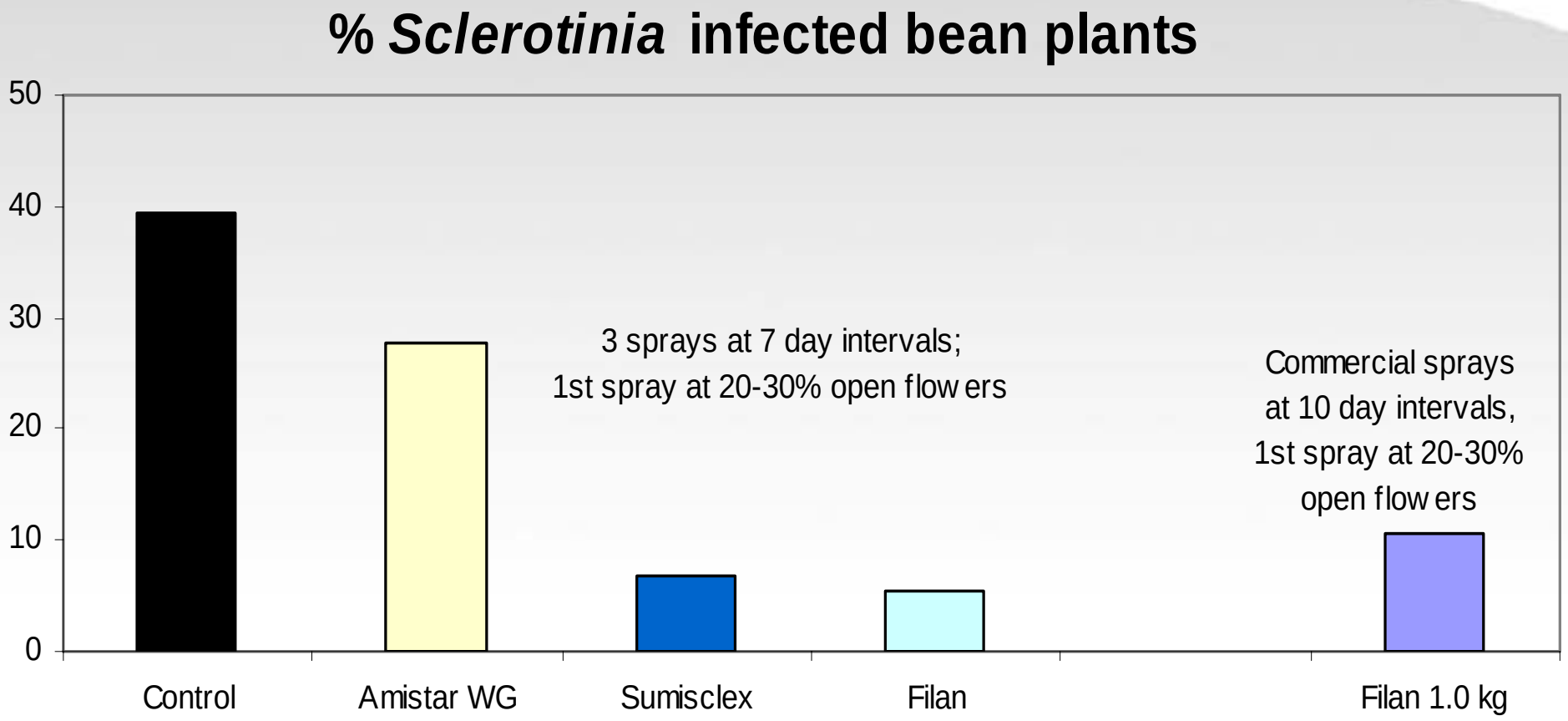
Efficacy affected by the 1st Fungicide Application 1999



Effects of spray nozzles & water volume 1998

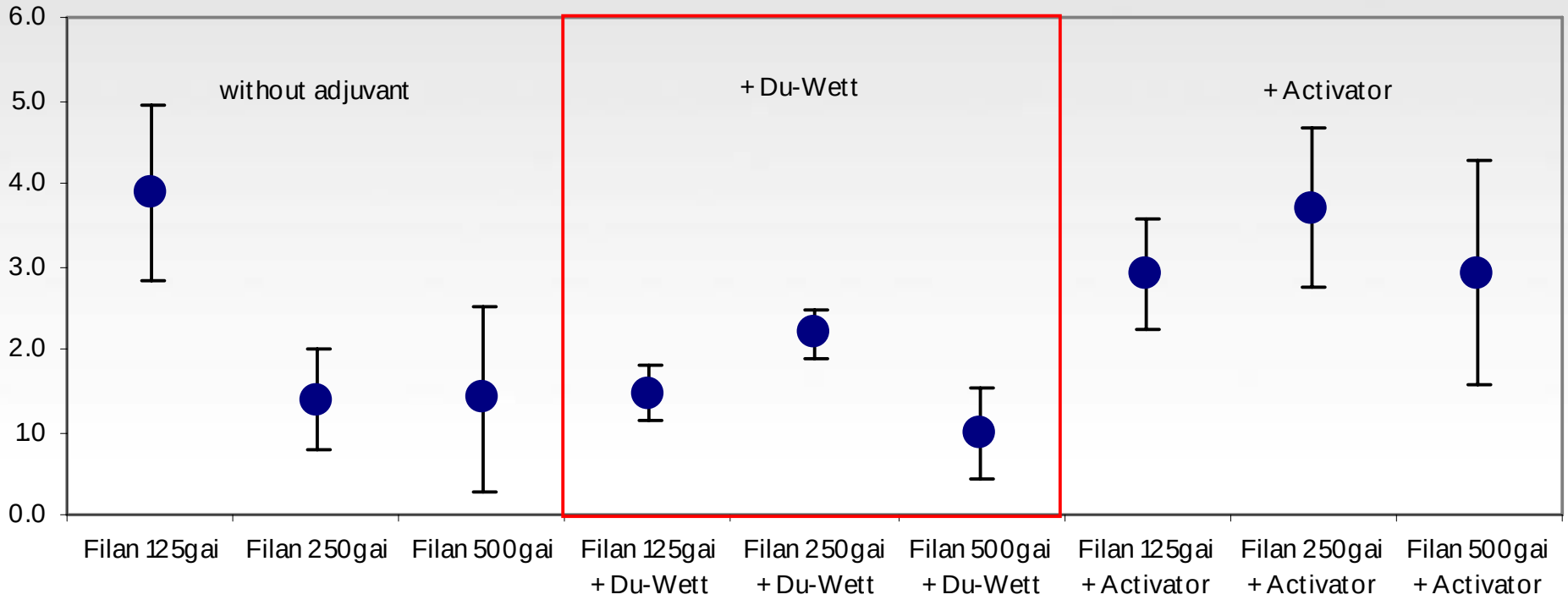


Number of fungicide applications 2006



Wetting agents – effects on coverage & performance 2007

% Sclerotinia infected plants +/- SE



Chemical control on beans – key findings

- No fungicide resistance
    - with procymidone, boscalid
- Field conditions – reduce risk factors
- Application methods
    - Types of fungicides
    - Timing of sprays
    - Number of sprays
    - Wetting agent
    - 250 to 300 L water /ha adequate

Other strategies 2000-2004

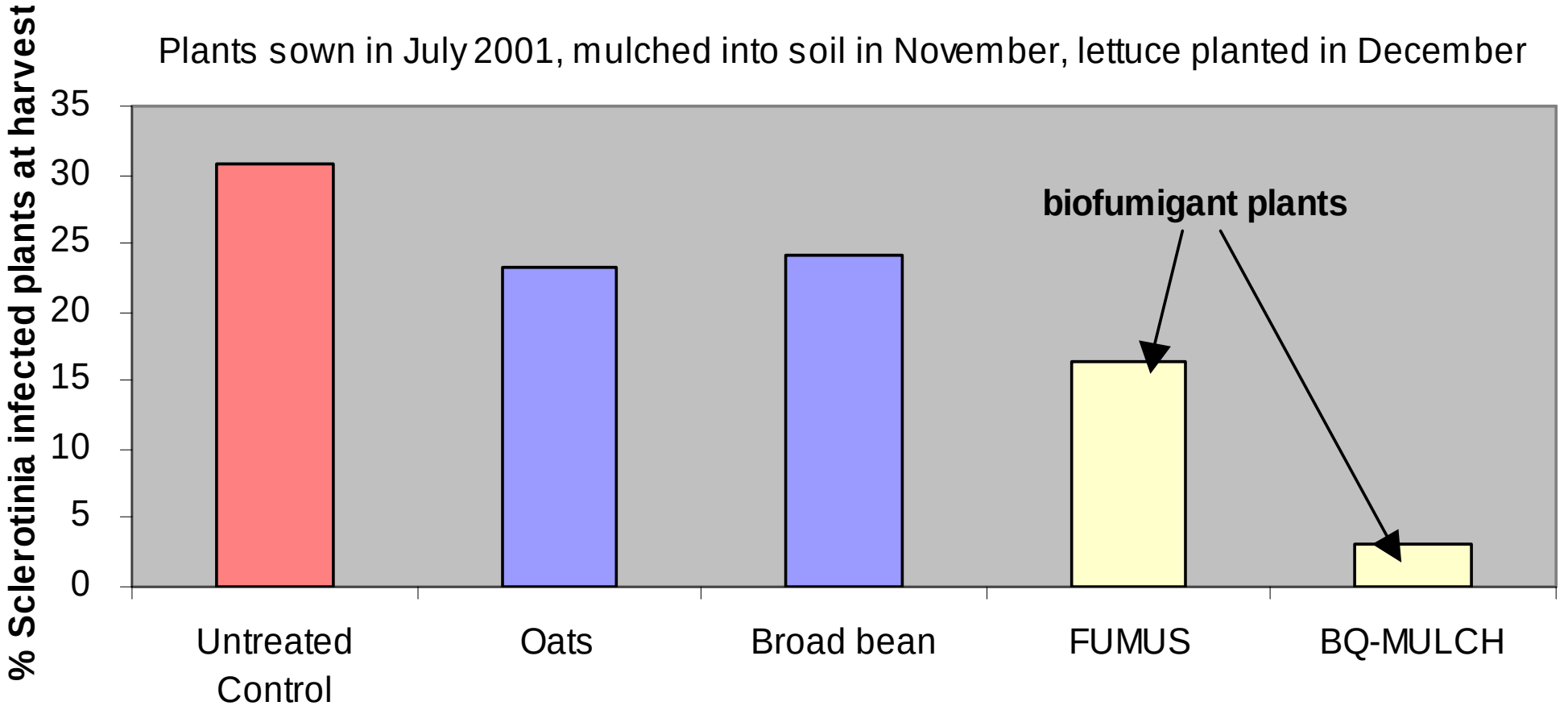
- Short term during crop period
  - Biocontrol agents
  - Other non-fungicides
- Long term between crops
  - Pre-plant treatments - reduce sclerotia in soil
  - Crop rotations, biofumigant crops - break disease cycle
  - Soil health - microbial diversity, soil structure

Green manure crops

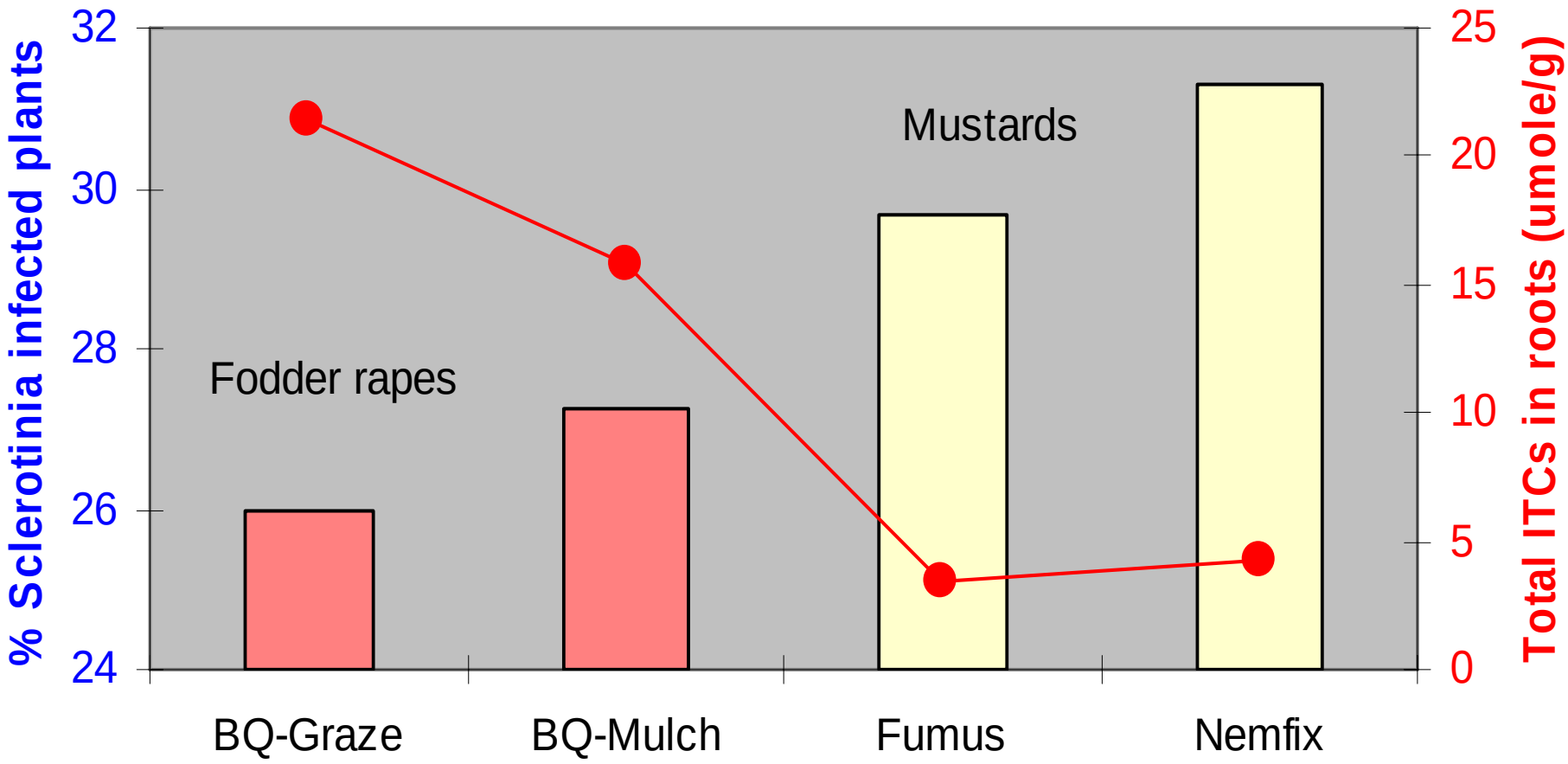
Break crop / biofumigation

Organic matter
Soil microbes
Soil structure
Soil nutrient

Biofumigant crops - reduce *Sclerotinia* wilt (lettuce drop)

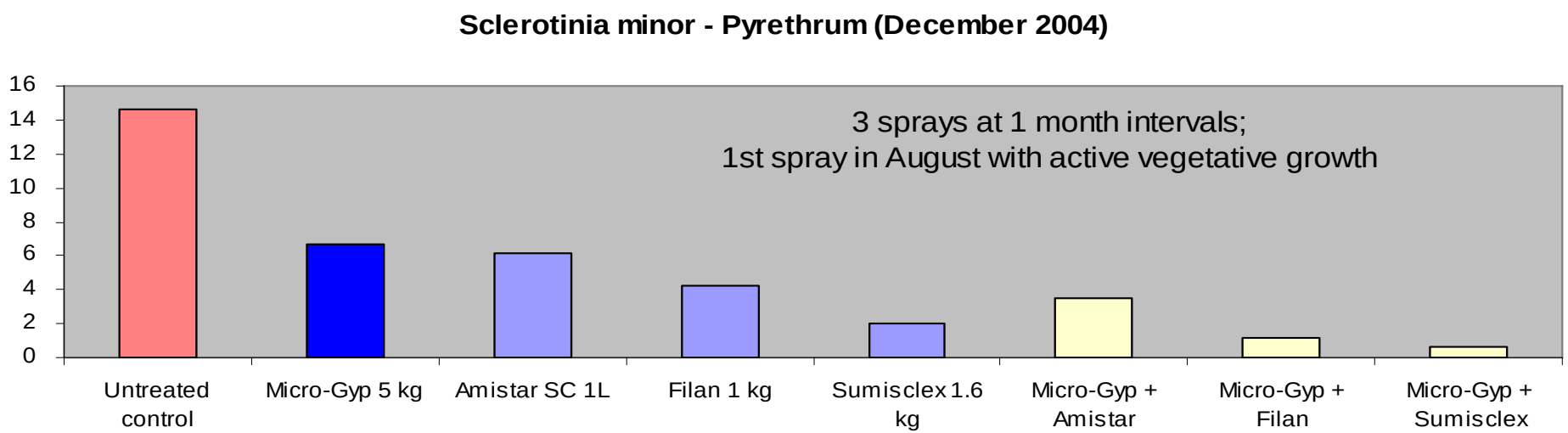


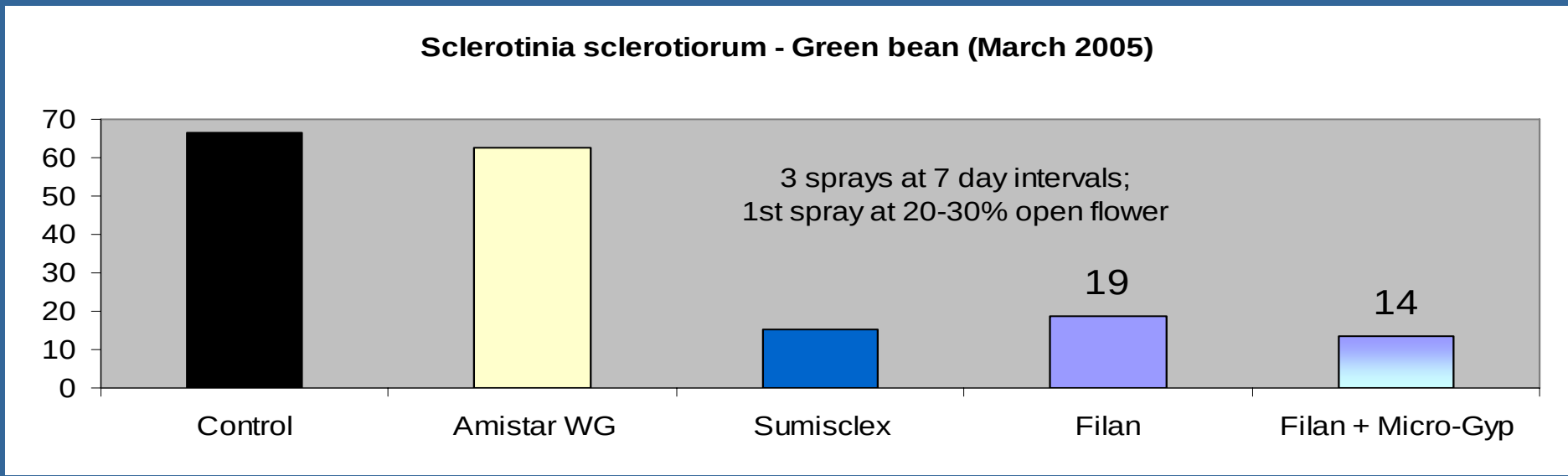
Fodder rapes - more effective in suppressing *Sclerotinia minor*



Fungicide alternatives to procymidone (Sumisclex)

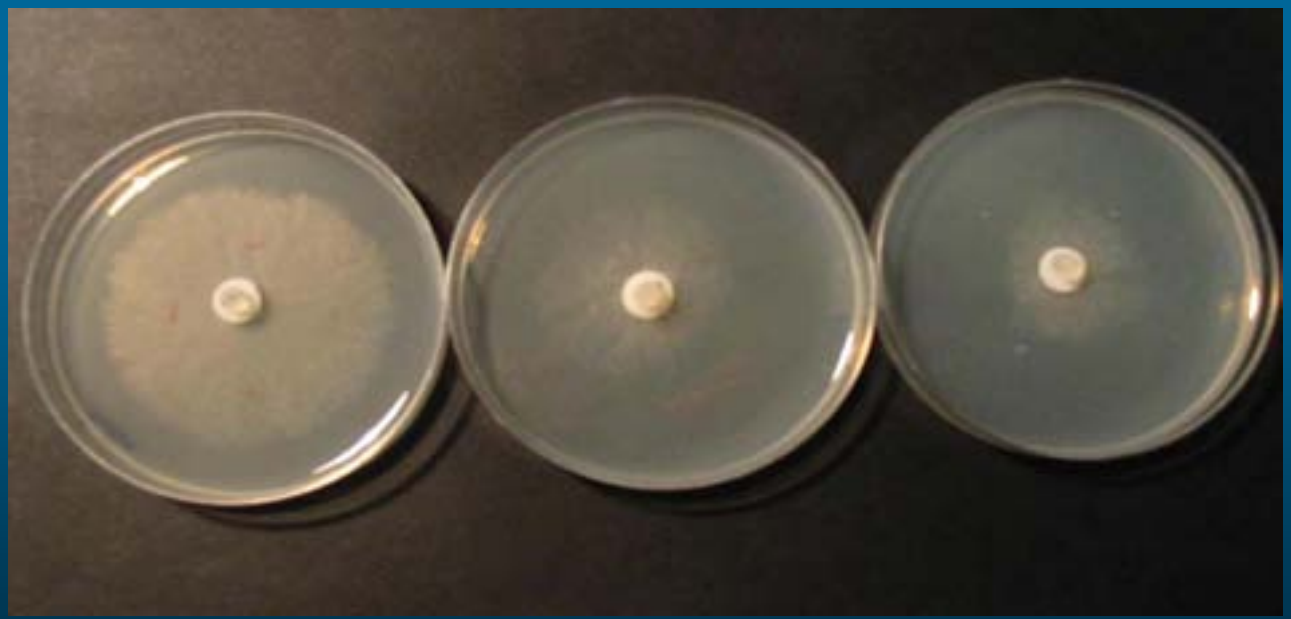
% *Sclerotinia* infected plants





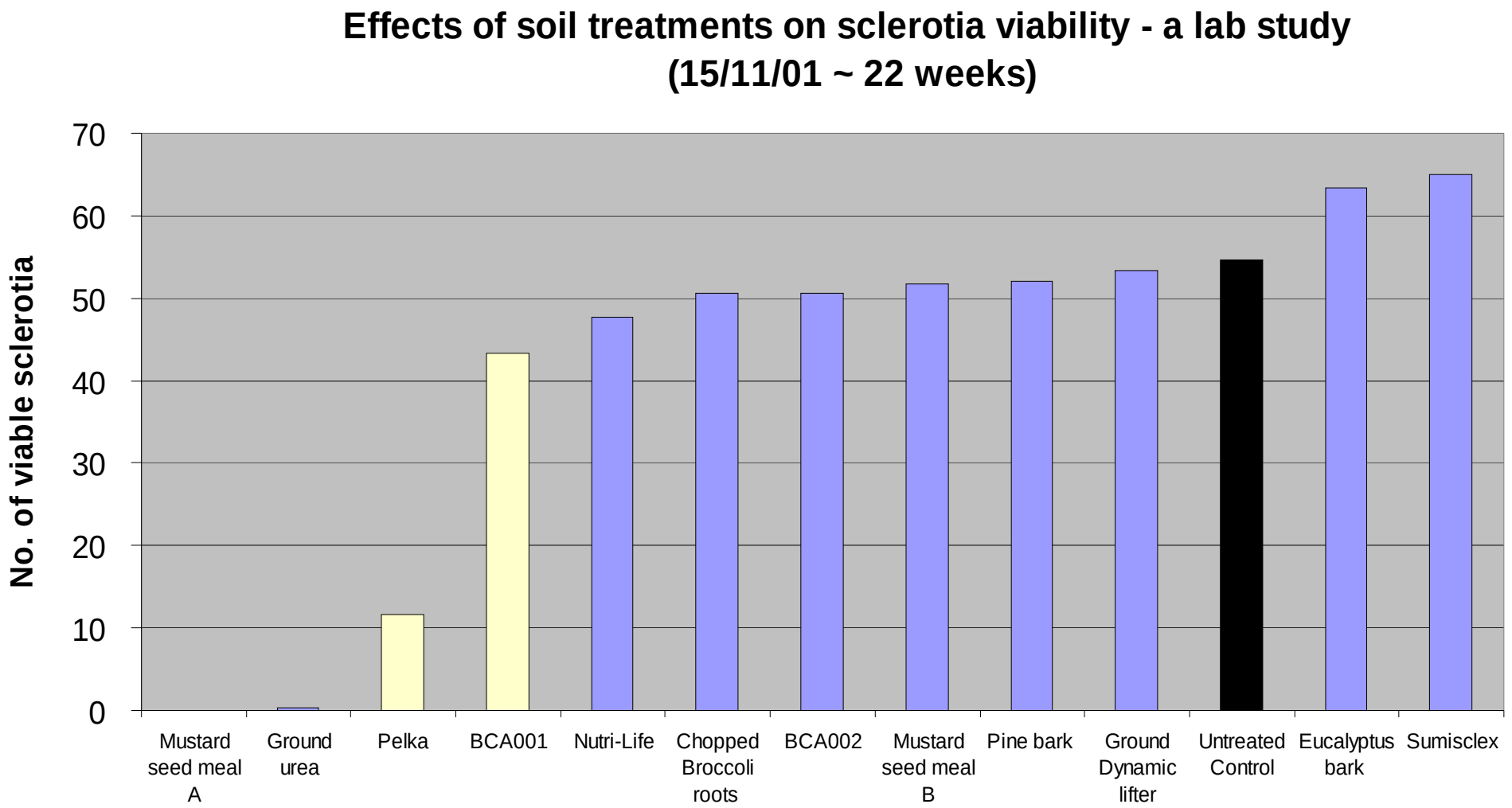
Low cost products for improving disease control & yield

- Filan / Sumisclex plus (~ $60 - $100/ha)
- Agri-Fos (~ $18 /ha)
- Micro-Gyp (~ $1.50 /ha)



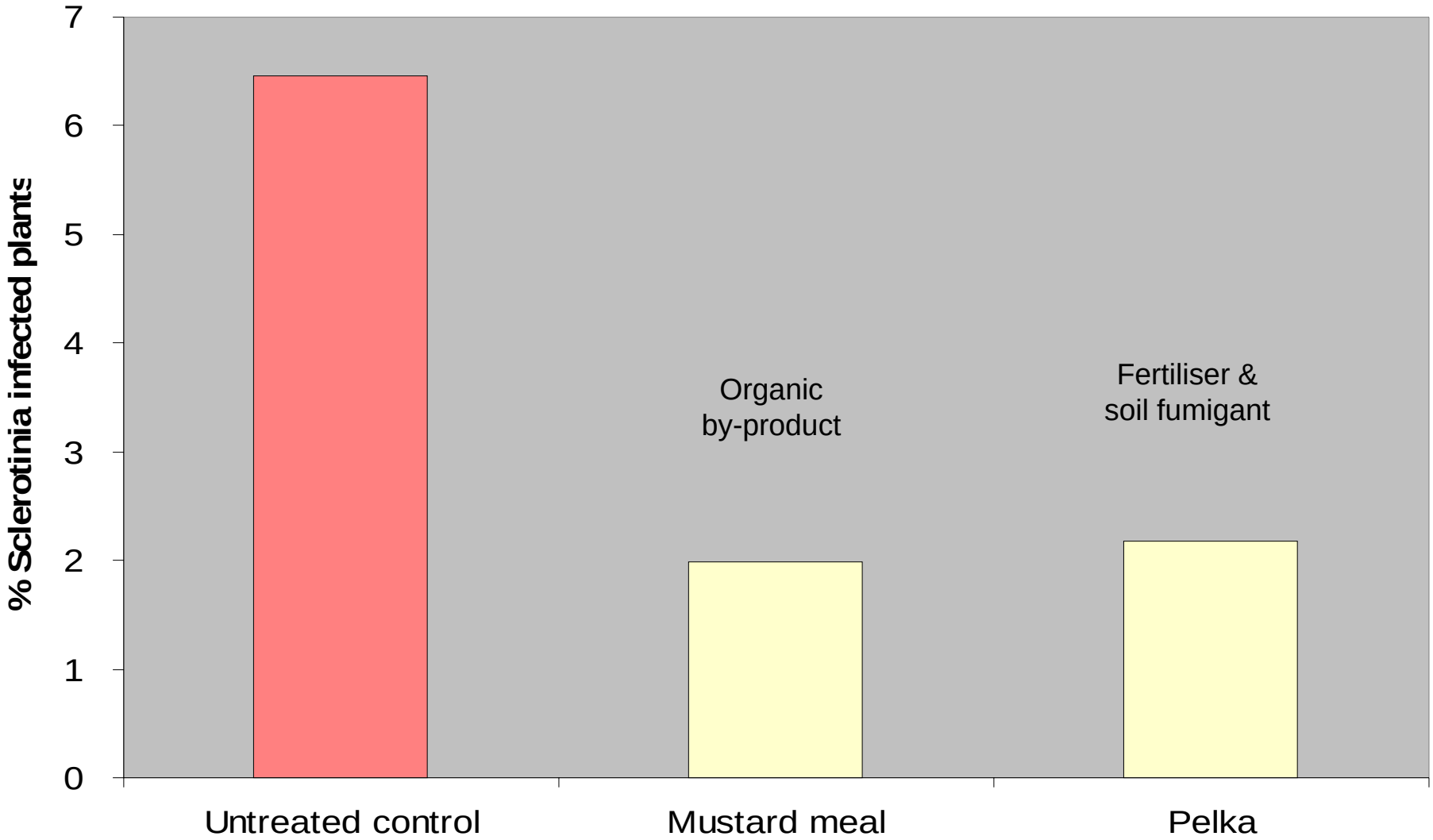
1% to 5% yield improvement for vegetables

Soil amendments

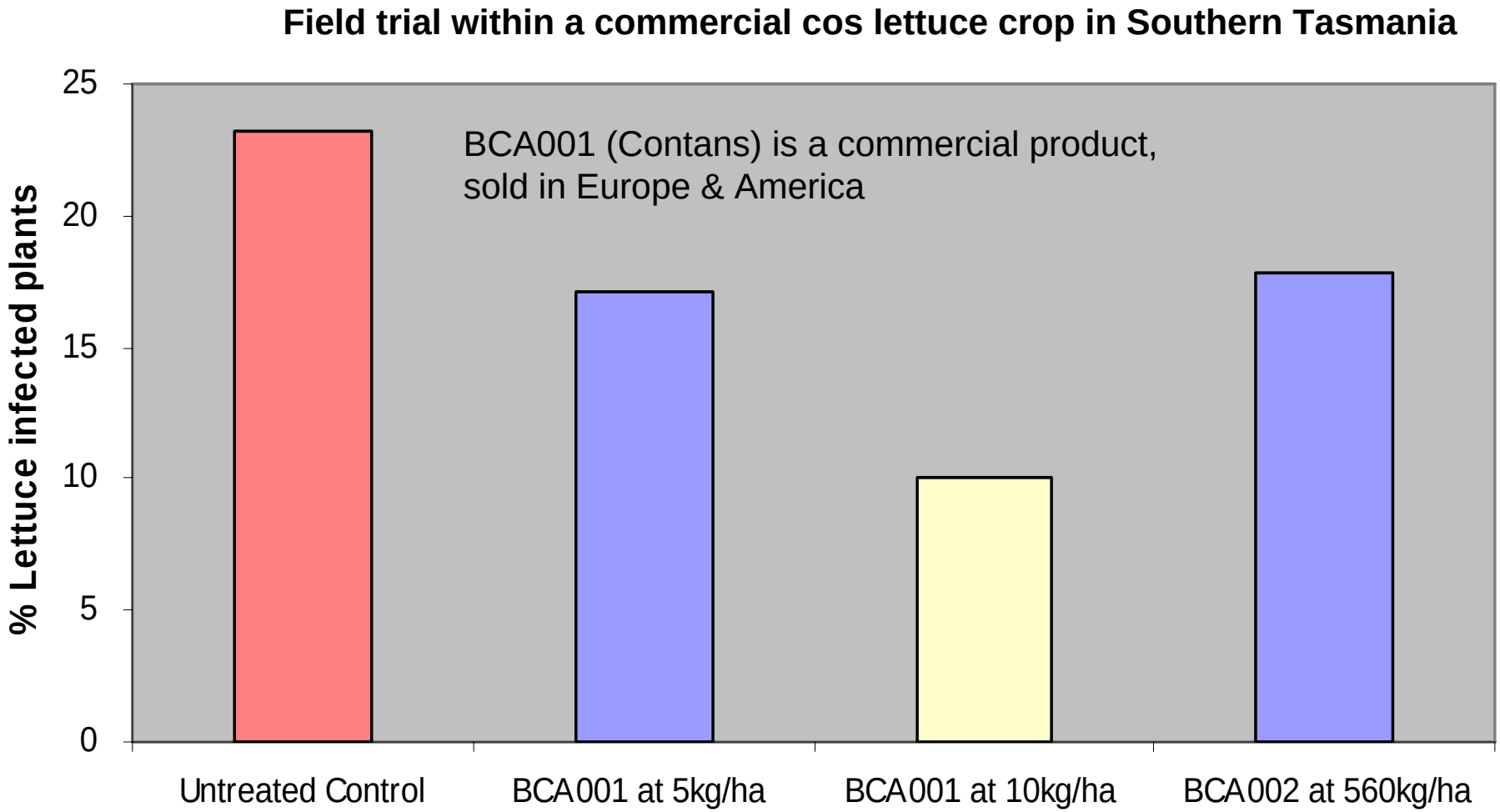


Soil amendments

Field trial within a commercial iceberg lettuce crop at Cuprona, Tasmania



Biocontrol agents -
Coniothyrum minitans, a fungal parasite of Sclerotinia



Non-chemical alternatives 2000-2005

- Will not replace chemical use
- Part of integrated management ?
- *S. sclerotiorum* vs *S. minor*

- Suppress/reduce pathogen in soil
  - Biocontrol agents ?
  - Brassica green manures
  - Crop rotations

Adoption of R & D outcomes (2000-2007) for improvement in *Sclerotinia* control

- ✓ 1998 - water volume - 250 to 300 L/ha adequate
- ✓ 1999 - early 1st spray timing on bean flowers
- ✓ 2003 pyrethrum, 2004 beans - use of gypsum with fungicide
- ✓ until 2004 - procymidone
- ✓ 2004 - BQ-Mulch (biofumigant crop)
- ✓ 2004 - boscalid (Filan) - emergency permit use
- ✓ 2005 - irrigation management (by Serve-Ag)
- ✓ 2007/08 – boscalid – application for registration use
- ✓ 2007 - use of Du-Wett with boscalid
- ✓ 2006 - Gympie, Queensland (an exception)
  - Constant hot, humid, wet condition & susceptible cultivars
  - Procymidone gives better efficacy, but still have ~ 20-30% infected plants