



Sclerotinia in horticultural crops – integrated management

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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

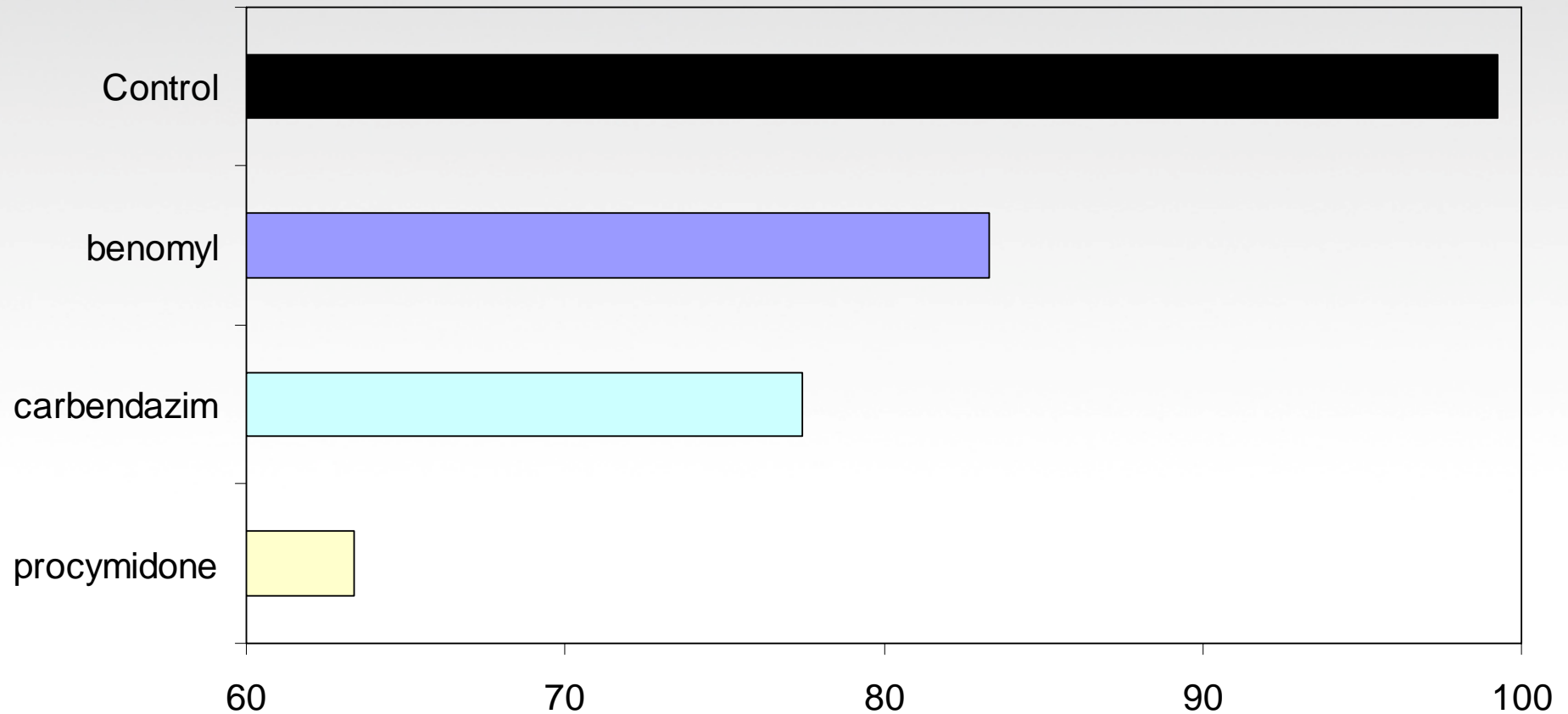
Sclerotinia control during bean crops

- ✓ **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

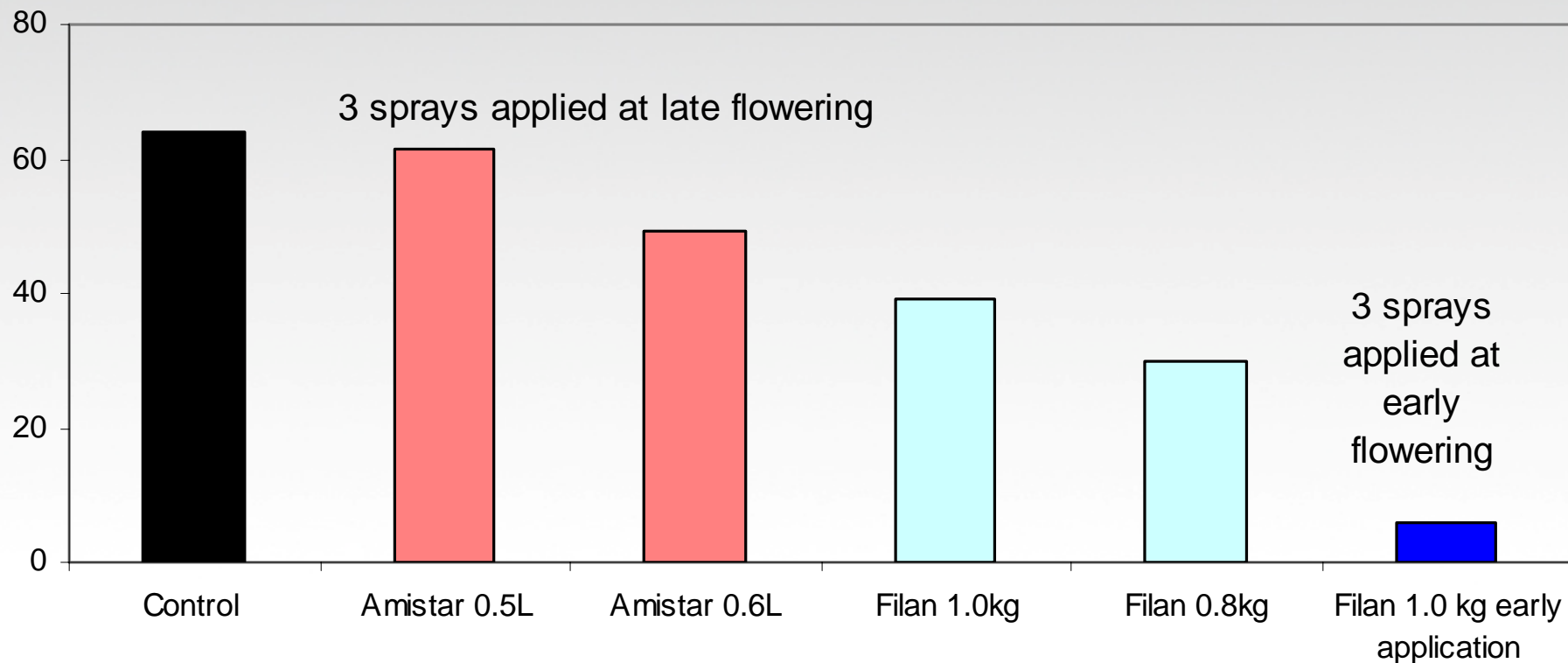
% Diseased Plants



Timing of applications

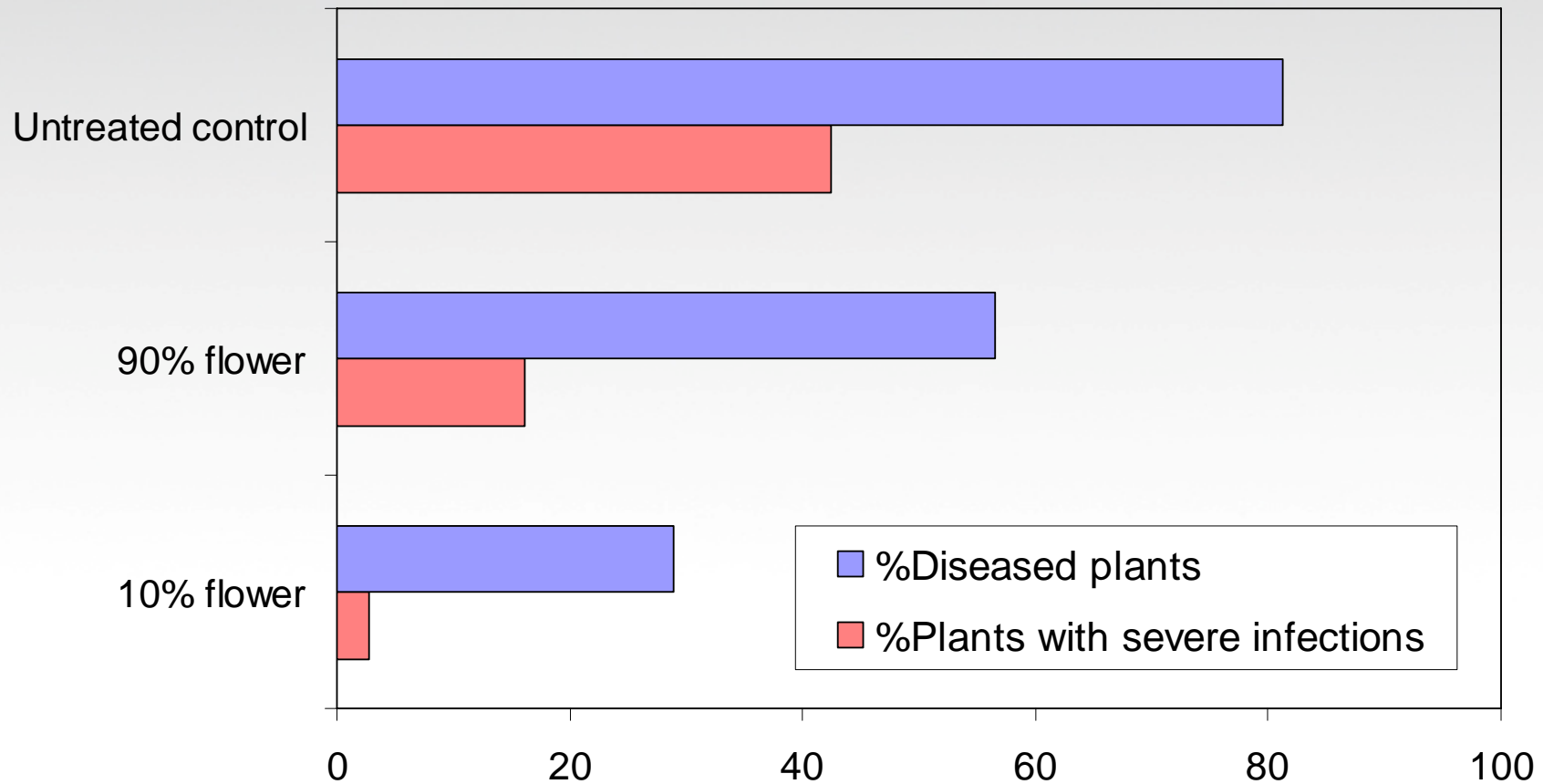
Merseylea, Tasmania 2005

% *Sclerotinia* infected plants



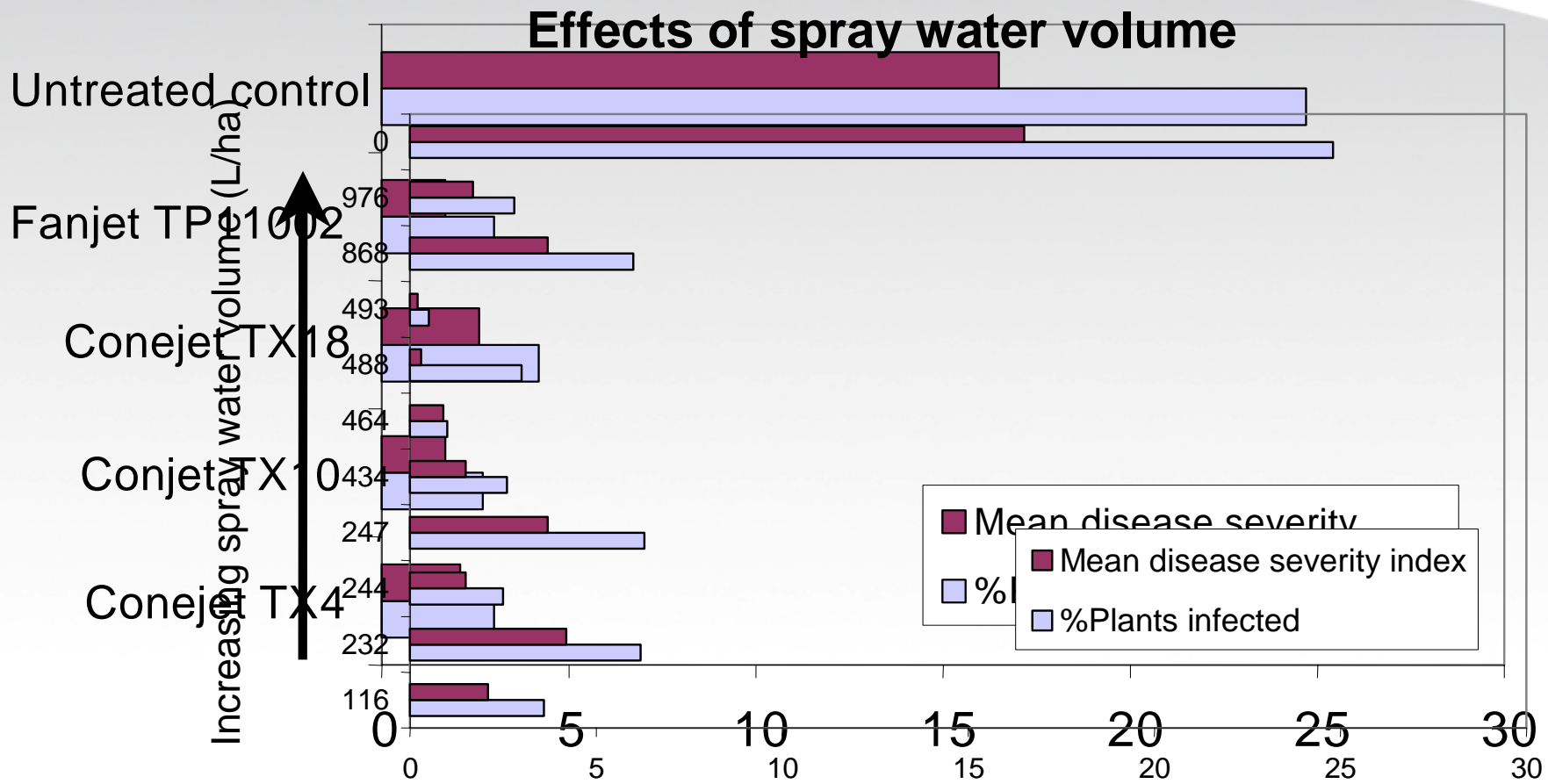
Efficacy affected by the 1st Fungicide Application 1999

Flowering based on % plants with first flower



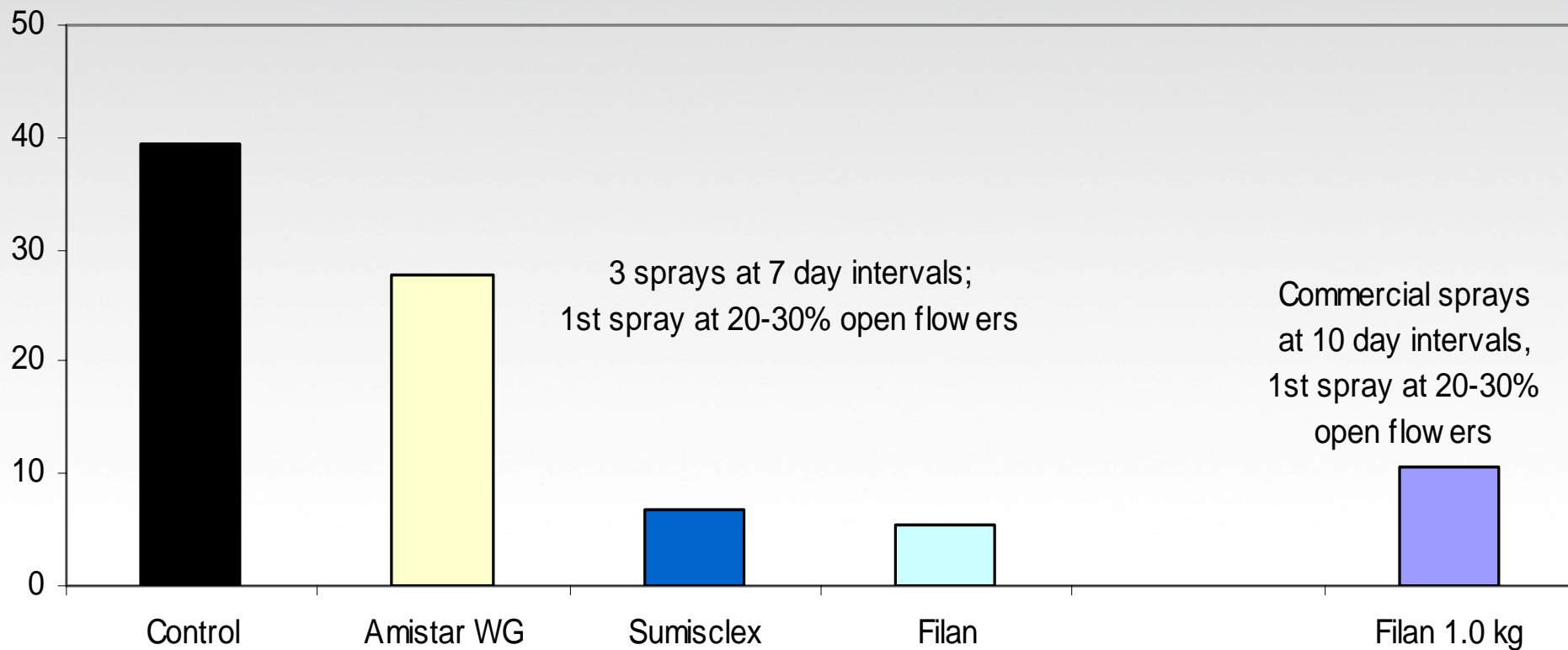
Effects of spray nozzles & water volume 1998

Effects of spray nozzle type



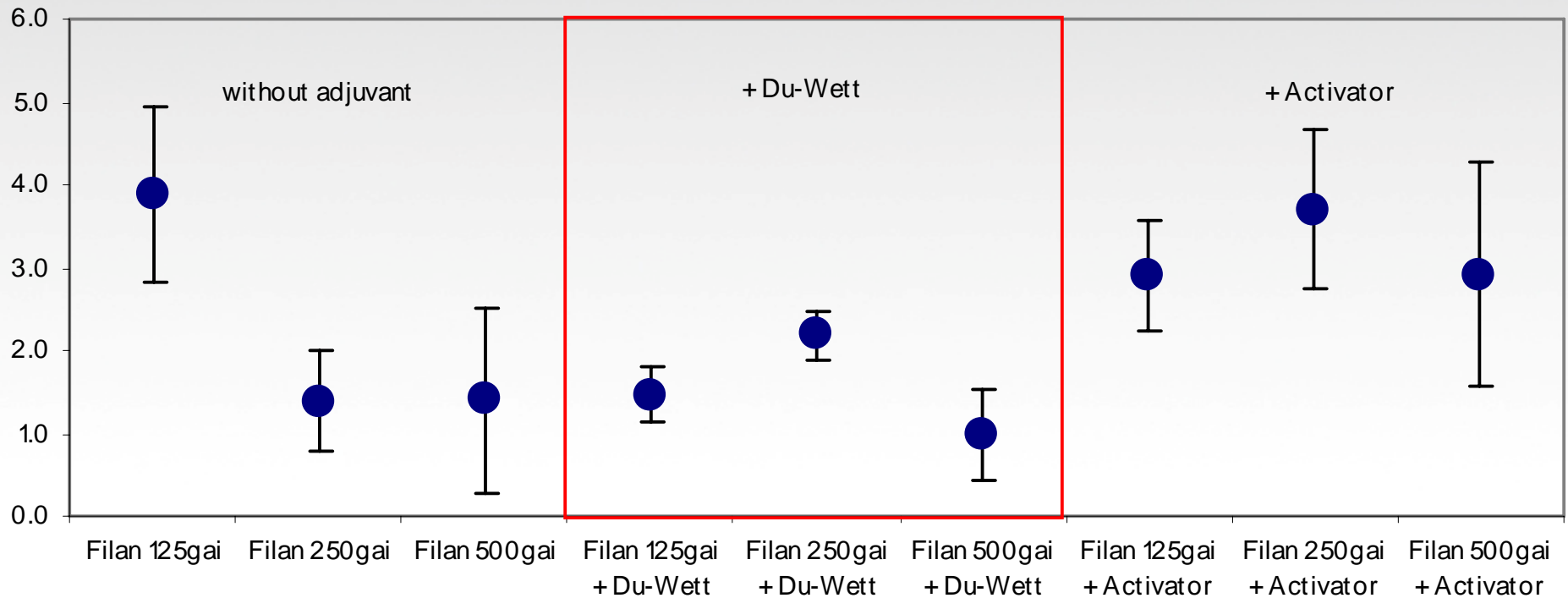
Number of fungicide applications 2006

% *Sclerotinia* infected bean plants



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

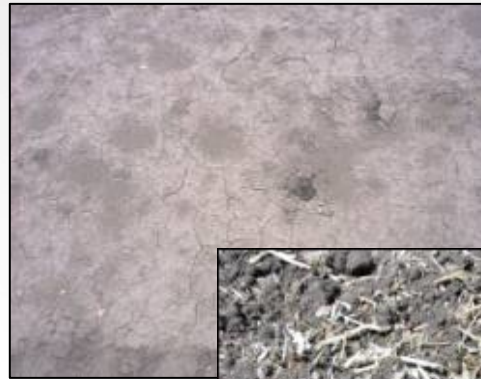
- Short term during crop period
 - Biocontrol agents
 - Other non-fungicides
- Long term between crops
 - Pre-plant treatments - reduce sclerotia in soil
 - Crop rotations, biofumigant crops - break disease cycle
 - Soil health - microbial diversity, soil structure

Green manure crops

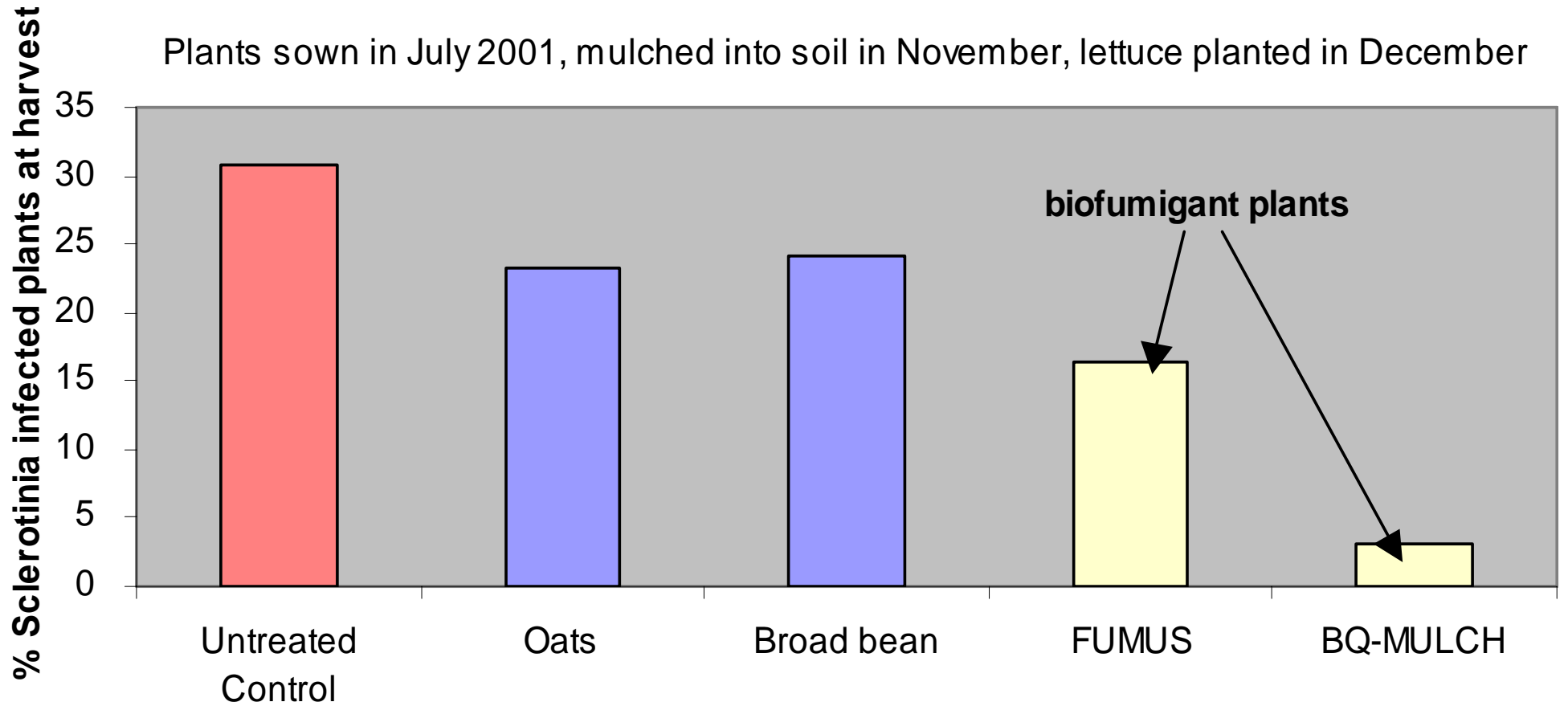


Break crop /
biofumigation

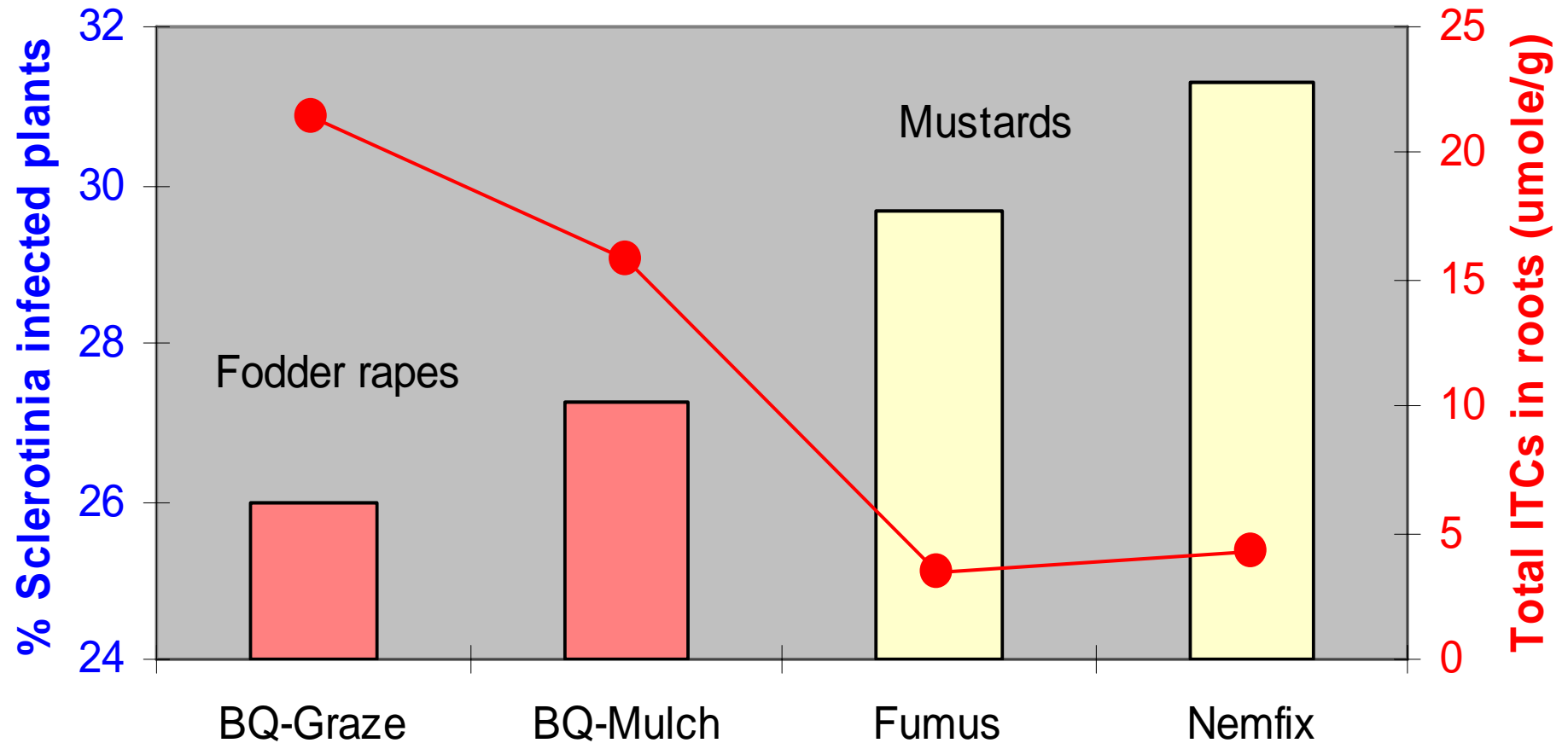
Organic matter
Soil microbes
Soil structure
Soil nutrient



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



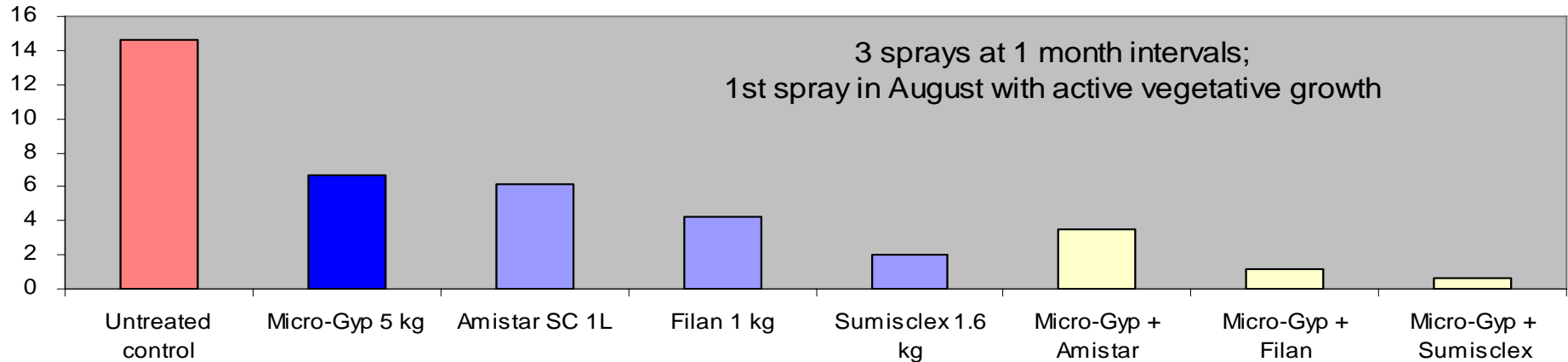
Fodder rapes - more effective in suppressing *Sclerotinia minor*



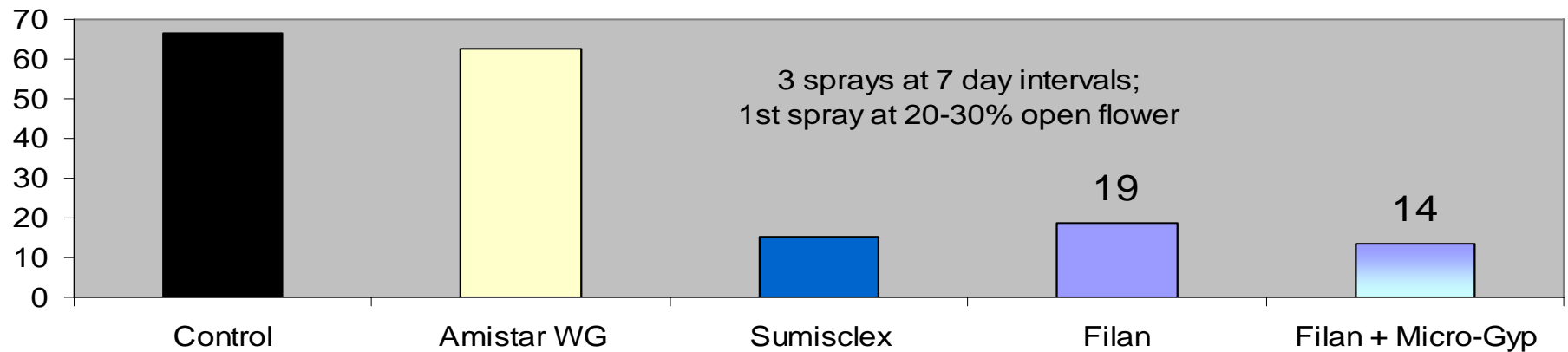
Fungicide alternatives to procymidone (Sumisclex)

% *Sclerotinia* infected plants

Sclerotinia minor - Pyrethrum (December 2004)



Sclerotinia sclerotiorum - Green bean (March 2005)

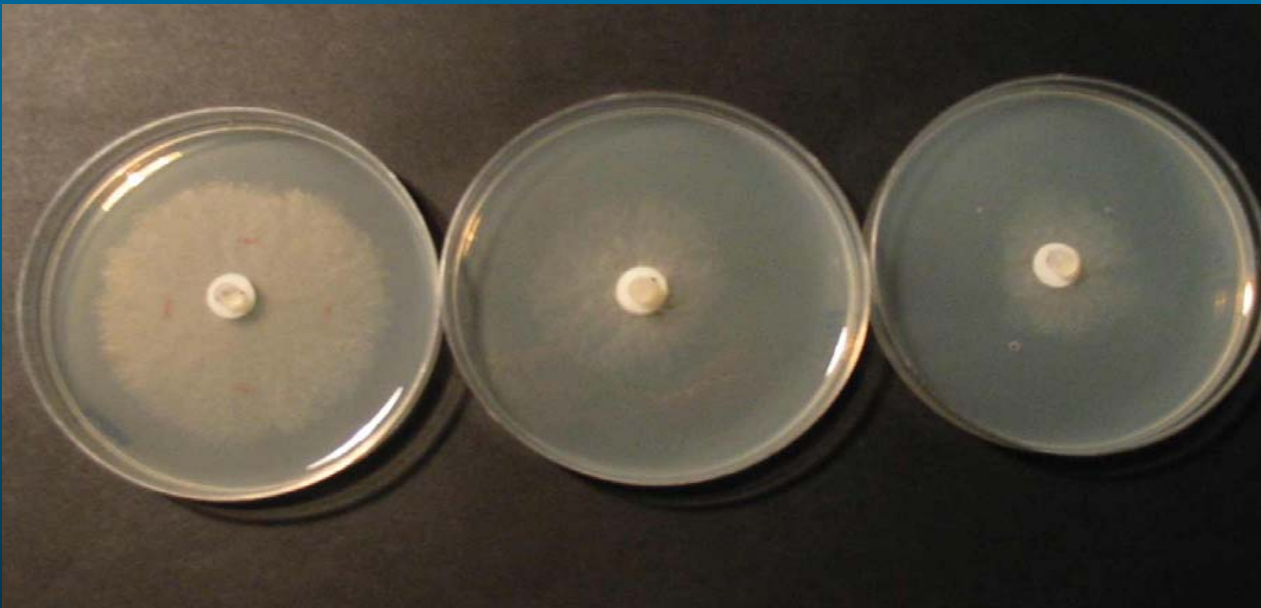
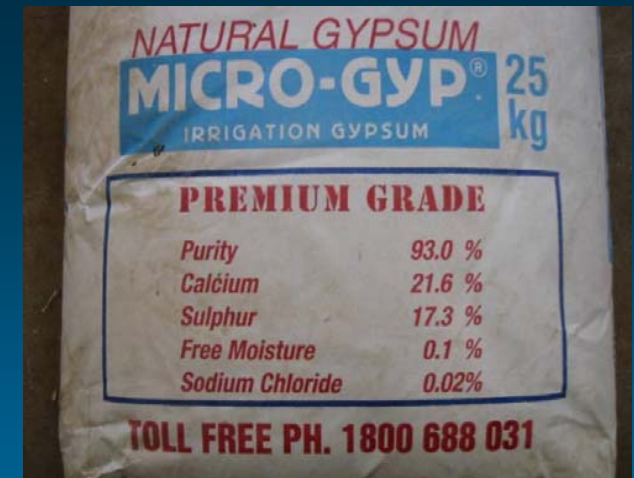


Low cost products for improving disease control & yield

- Filan / Sumisclex plus (~ \$60 - \$100/ha)

- Agri-Fos (~ \$18 /ha)

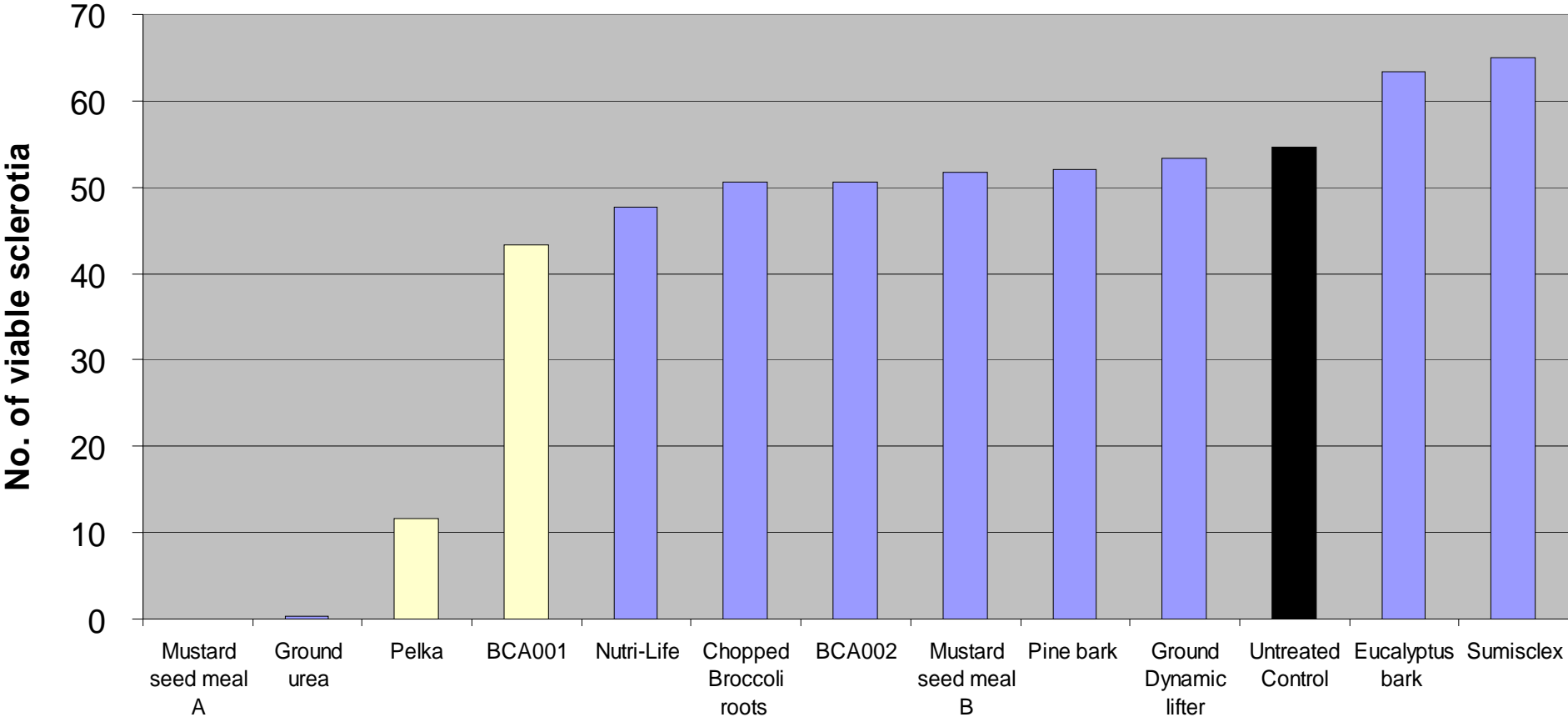
- Micro-Gyp (~ \$1.50 /ha)



1% to 5% yield
improvement for
vegetables

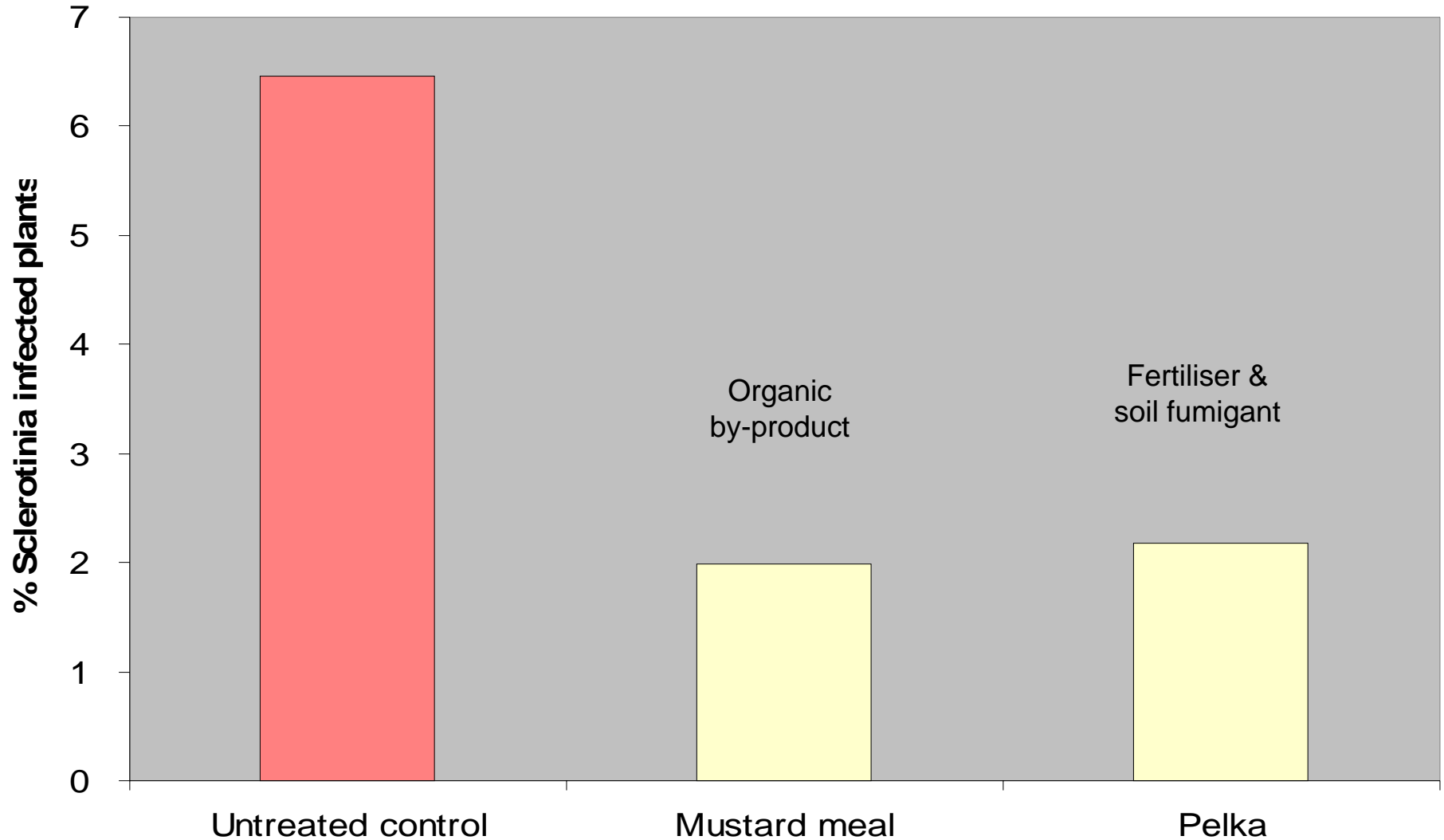
Soil amendments

Effects of soil treatments on sclerotia viability - a lab study
(15/11/01 ~ 22 weeks)



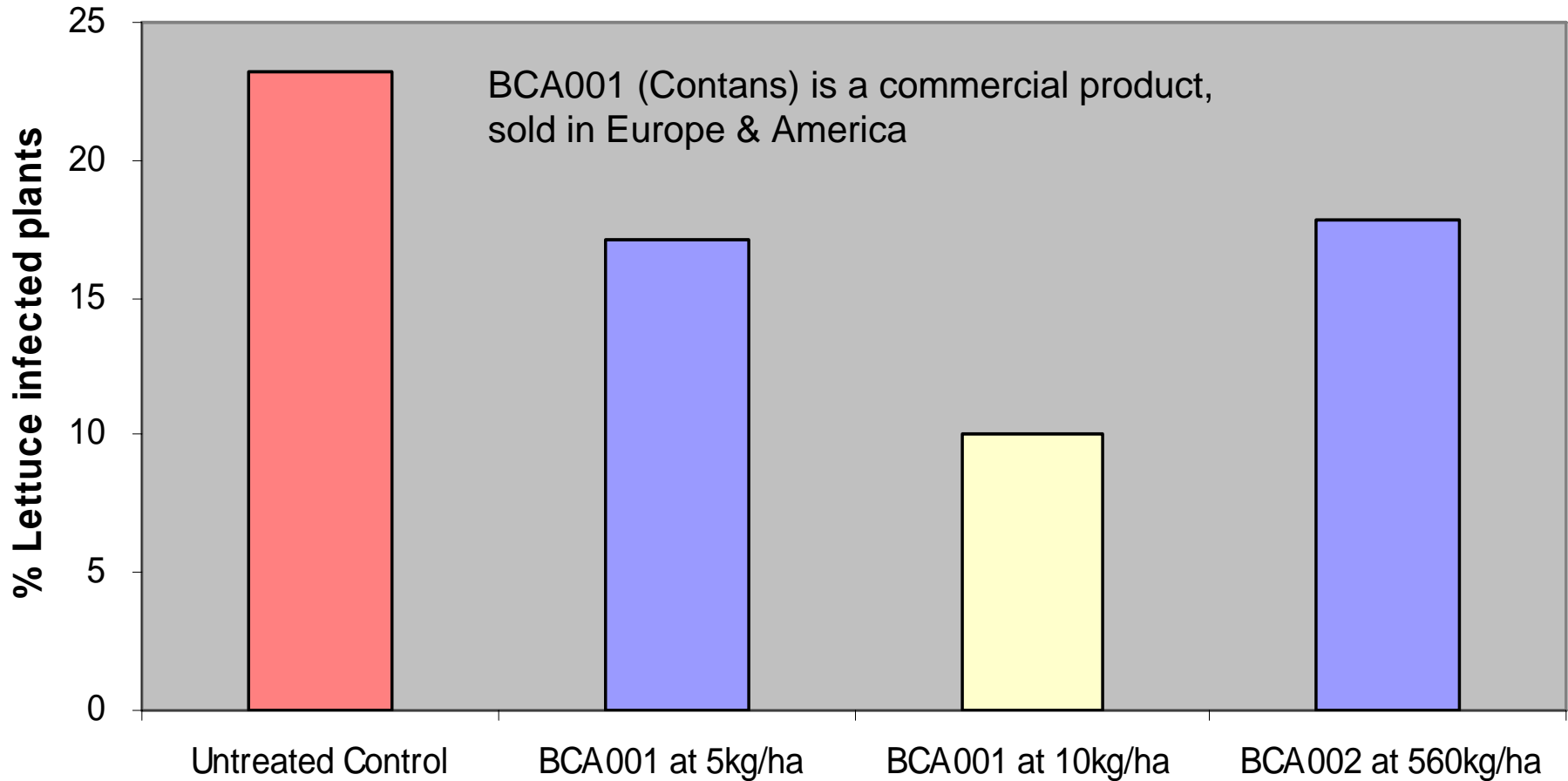
Soil amendments

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



Biocontrol agents - Coniothyrium minitans, a fungal parasite of Sclerotinia

Field trial within a commercial cos lettuce crop in Southern Tasmania



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