Management Strategies for Lettuce Drop in Arizona and California

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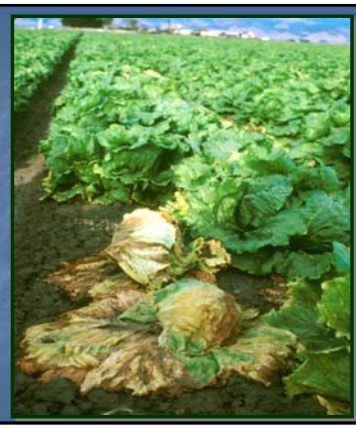
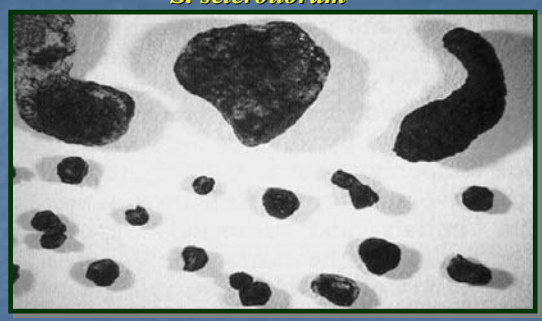
Lettuce Drop



The Pathogens: *Sclerotinia minor* and *S. sclerotiorum*

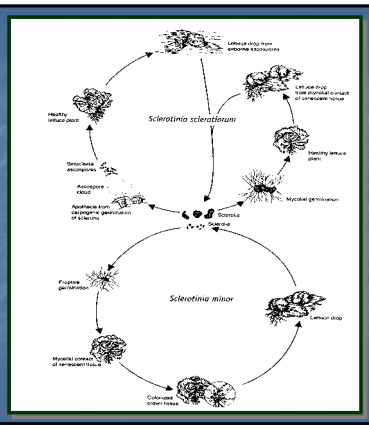
- over 1500 recorded hosts
- cottony rot, white mold, watery rot on fruits, flowers, leaves, stems, and roots
- growth is favored by moist conditions
- both species produce long-lived resting structures known as sclerotia

S. sclerotiorum

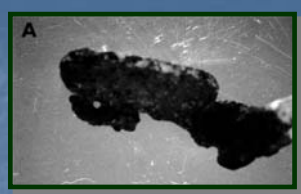


S. minor

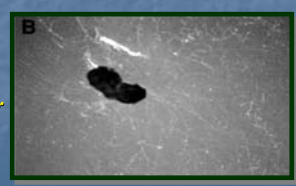
Lettuce drop disease cycle



Eruptive Germination

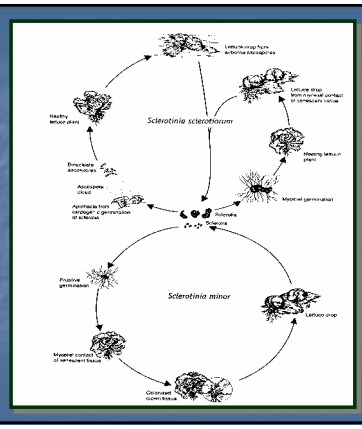


S. sclerotiorum



S. minor

Lettuce drop disease cycle



Apothecium discharging ascospores

Integrated disease management of lettuce drop

- host resistance
- cultural practices
- chemical control
- biocontrol

Host Resistance

- No commercially acceptable cultivar exist
- Most breeding programs have focused on *S. minor*
  -"slow-dying" phenotypes have been described
- Little progress has been made on resistance to *S. sclerotiorum*

Cultural Practices

- Crop rotation
  -broccoli rotation for control of *S. minor*
  -fallow rotation for control of *S. sclerotiorum*
- Irrigation
  water management is key to reduced disease
  -furrow…sprinkler…subsurface drip

Chemical control of lettuce drop

- iprodione (Rovral)
- vinclozolin (Ronilan)
- dicloran (Botran)
- boscolid (Endura)

2003 Yuma Fungicide Trials

Treatment	Rate lb a.i./A	*S. minor*	*S. sierotiorum*
Rovral 4F	1.0	6.4	29.2
Ronilan 50DF	1.0	9.8	21.2
Endura 70WG	0.35	10.0	16.6
Serenade AS	4.0 qt prod.	10.0	27.4
Pristine 38WG	0.4	10.2	27.8
Botran 5F	1.87	10.8	24.6
Endura 70WG	0.45	11.0	17.2
Pristine 38WG	0.45	11.0	19.8
Botran 5F	3.75	11.0	28.2
Switch 62.5WG	0.43	11.6	27.6
Endura 70WG	0.35	11.8	37.2
Switch 62.5WG	0.56	12.4	30.0
Contans	4.0 lb prod.	12.6	12.8
Contans	2.0 lb prod.	16.8	18.2
Non-treated control	--------	23.2	37.8

*each plot contained approx. 55 plants

Benefits of biocontrol strategies

- complement other disease management strategies
- development of resistance unlikely
- cost effective
- few restrictions on use
- worker and environmental safety
- development of specialty markets

Objectives 2002-2003

- evaluate the efficacy of commercially available biocontrol agents for the control of lettuce drop
- evaluate the survival of biocontrol agents in the field
- evaluate the sensitivity of biocontrol agents to Botran, Rovral, and Ronilan

Evaluate the efficacy of commercially available biocontrol agents for the control of lettuce drop

- Contans - *Coniothyrium minitans*
- Soilgard - *Gliocladium virens*
- Trichodex, Supresivit, TRI 002 - *Trichoderma harzianum*
- Companion – *Bacillus subtilis*
- *Sporidesmium sclerotivorum*

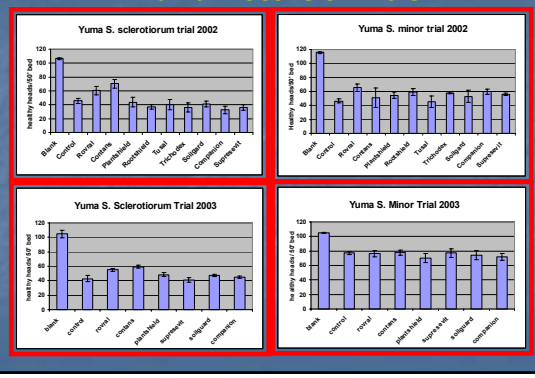
Evaluate the efficacy of commercially available biocontrol agents for the control of lettuce drop

- RCBD with 4 blocks
- biocontrol treatments plus one fungicide treatment plus control
- two trials - high and low density of sclerotia- *S. minor* and *S. sclerotiorum*
- two application schedules - pre-plant application and pre-plant plus side application

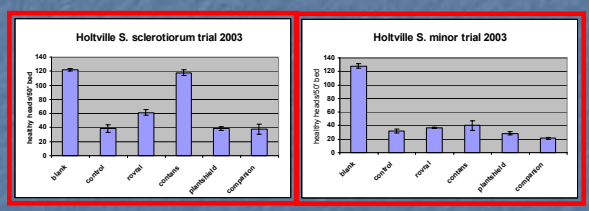
Evaluate the efficacy of commercially available biocontrol agents for the control of lettuce drop

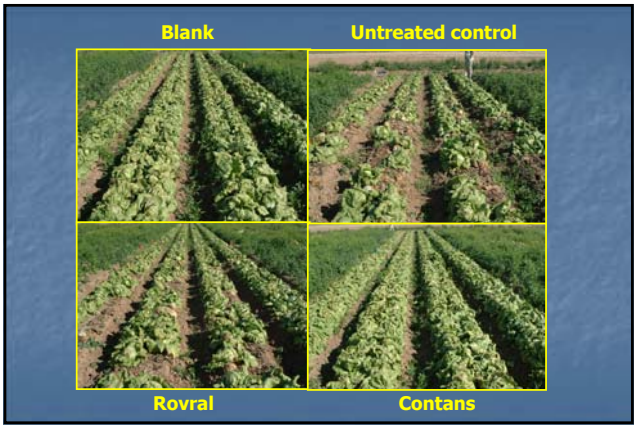
- record incidence of lettuce drop
- record number and weight of marketable lettuce heads

Yuma Biocontrol Trials



Imperial Valley Biocontrol Trials





Long-term Objective

- To develop biocontrol strategies for desert winter lettuce production that are compatible with chemical and cultural management strategies