

Managing Late Season Fruit Rots



Late Season Bunch Rot Diseases

• *Phomopsis viticola* Phomopsis rot

• *Colletotrichum* spp. Ripe rot
• *Greeneria uvicola* Bitter rot
(*Melanconium fuligineum*)

• Sour rot

• *Botrytis cinerea* Botrytis bunch rot
• *Botryosphaeria dothidea* – macrophoma rot

Black rot – *Guignardia bidwellii*



Phomopsis – *Phomopsis viticola*

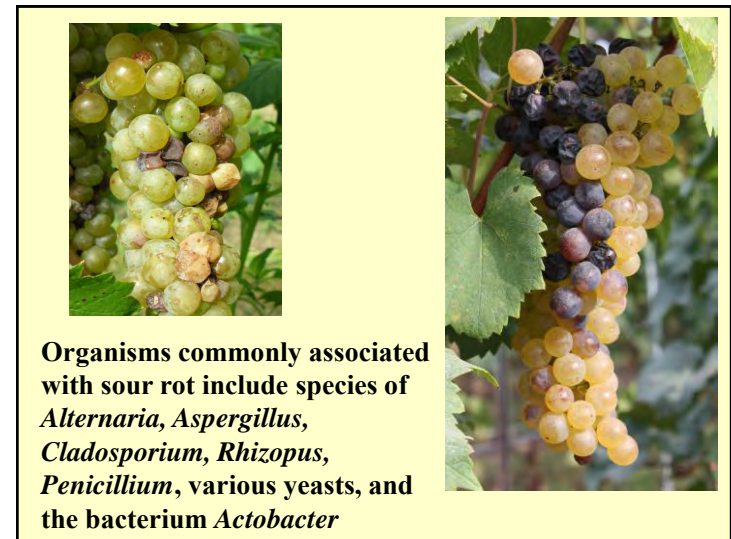
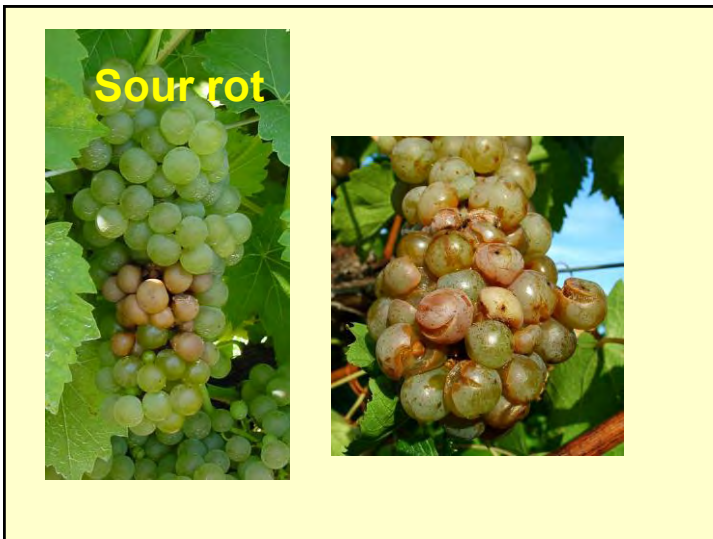
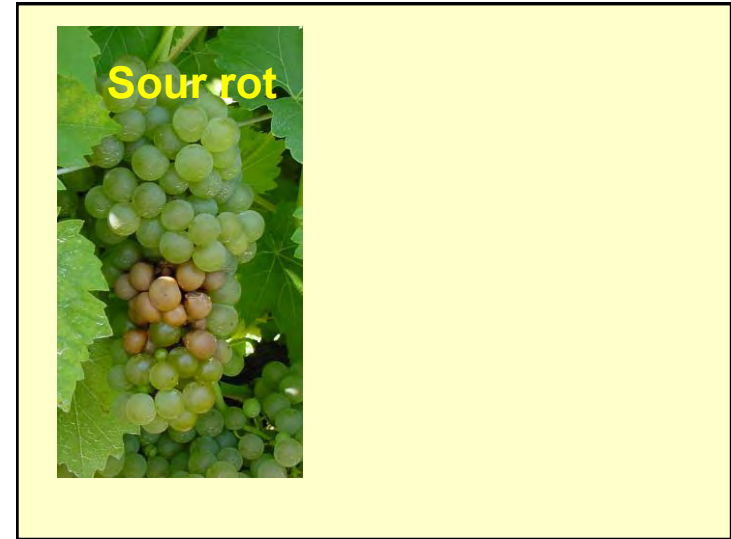
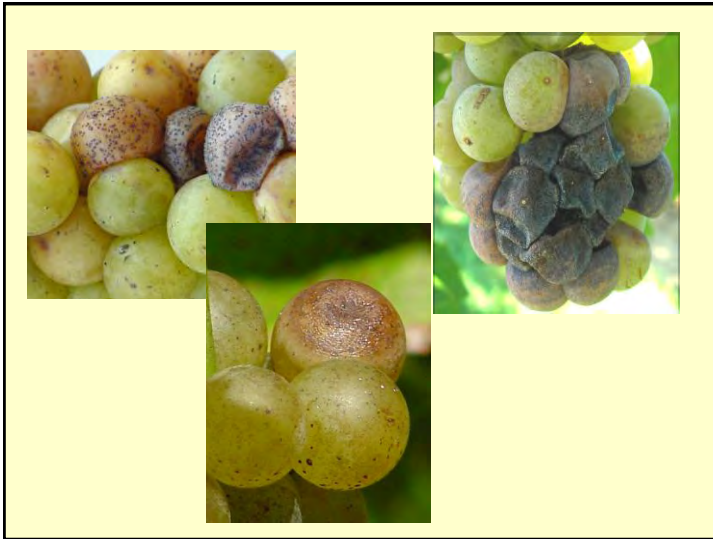


**Bitter rot –
*Greeneria uvicola***



Ripe rot – *Colletotrichum gloeosporioides*/ *C. acutatum*/ *Glomerella cingulata*





Botrytis – *Botrytis cinerea*



**Macrophoma rot –
*Botryosphaeria dothidea***



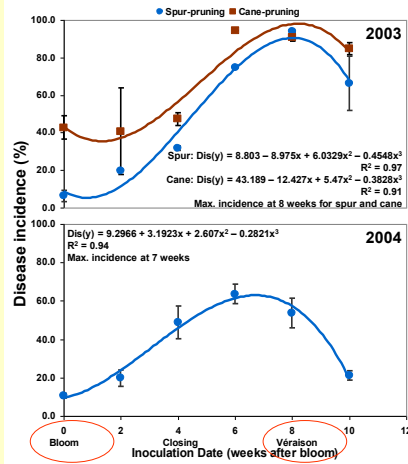
Period of fruit susceptibility in *V. vinifera*

- Locations
 - NCDA&CS Upper Piedmont Research Station (Rockingham Co, NC)
 - ‘Cabernet Franc’
 - ‘Chardonnay’
 - Iron Gate Vineyards (Alamance Co, NC)
 - ‘Merlot’
- Treatments
 - 5 clusters x 4 cordons x 6 (or 7) inoculation periods (every 2 weeks starting at bloom)
 - Inoculated with spore suspension (10^5 conidia WBS/ml), bagged overnight, and evaluated for disease incidence at harvest.



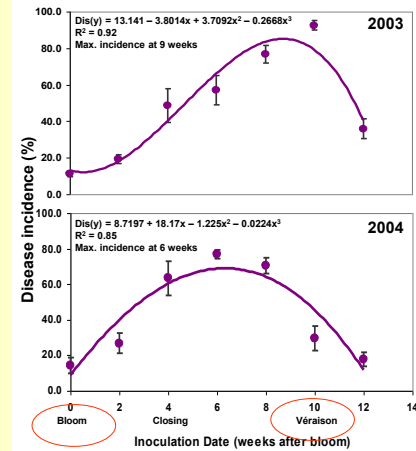
Period of fruit susceptibility in *V. vinifera* 'Merlot'

G. uvicola

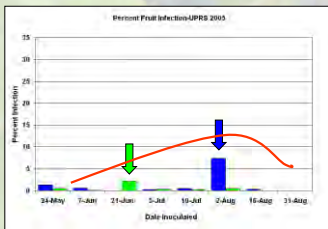


Period of fruit susceptibility in *V. vinifera* 'Cabernet Franc'

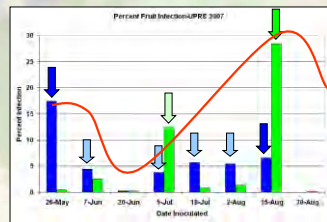
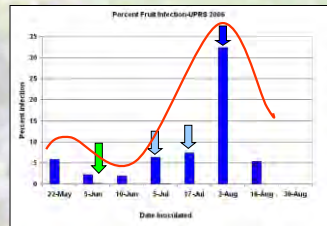
G. uvicola



Susceptibility of Fruit Results 2005-2007



Chardonnay P=0.05 Control=.65
 Cab Franc P=0.05 Control=0



Chardonnay P=0.05 Control=.11
 Cab Franc P=0.05 Control=0

Chardonnay P=0.05 Control=0.1
 Cab Franc P=0.05 Control=0

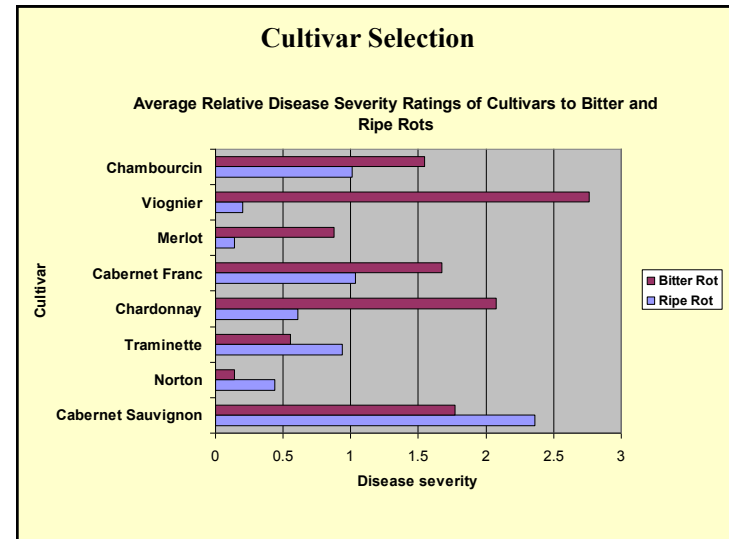
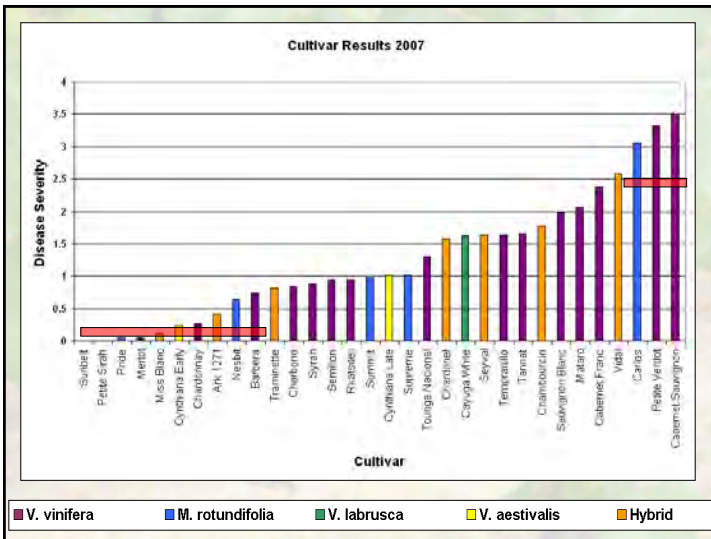
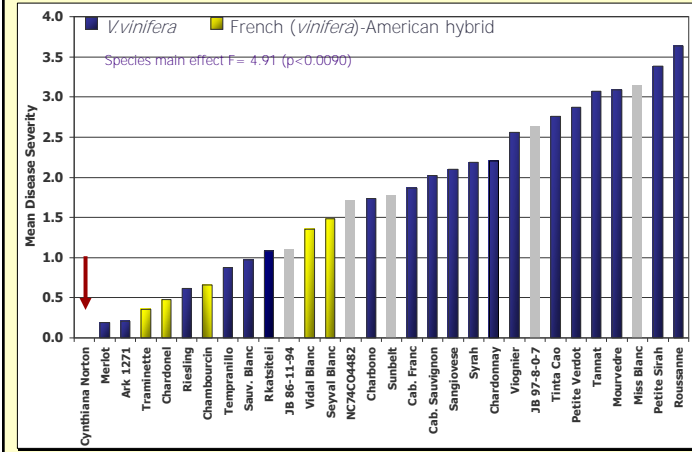


III. Relative susceptibility of winegrape cultivars to bitter rot

- Fruit were harvested at $\geq 16^\circ\text{Brix}$.
 - 2003: 30 cultivars and selections
 - 2004: 33 cultivars and selections
 - 2 replications
 - 13 cultivars and selections inoculated once
- Surface disinfested, rinsed, and allowed to dry overnight.
- 20 fruit x 4 clusters x 38 cultivars
- 20 fruit/cultivar were used as noninoculated control.
- Incubated at 26°C under continuous light for 7 days before disease severity was evaluated.
- Statistical analysis
 - Disease severity was averaged over each cluster
 - ANOVA
 - Effects of interest:
 - Species
 - Time of ripening
 - Soluble solids (i.e. Brix)
 - Fruit color
 - Waller-Duncan k -ratio t test where $k = 100$



Relative susceptibility of winegrape cultivars to bitter rot



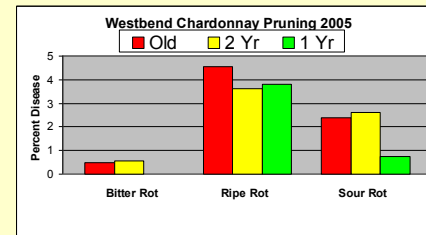
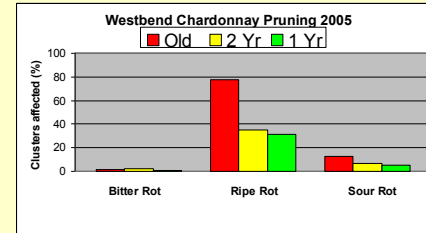


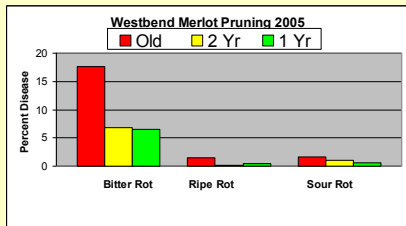
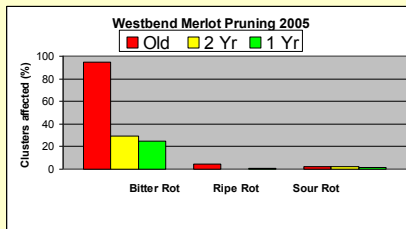
Management of Bunch Rot Diseases – Long Term and Short Term

Management of bunch rot diseases -

- Sanitation
- Pruning - spur vs cordon
- Canopy management:
shoot positioning, shoot thinning, hedging
leaf removal
- Fungicide sprays

Vine training – spur vs cordon pruning





Considerations for fungicide use

- Which fungicide? fungicides vary in activity and need to be matched to the diseases that present a problem at the time of application
- What rate? based on previous disease history and weather
- When? follow calendar but need to be flexible (variety differences)
- How much water? - as much as you can

Relative Activity of Fungicides

Fungicide	Bitter rot	Ripe rot	Botrytis
QoI	+++	+++	+++
Topsin M	+++	0	++
Captan	+++	++++	+
Vangard/Rovral			
Elevate/Endura/			
Scala	0	0	++++
DMI	++	0	0
Copper	+?	+ ?	0
Mancozeb	++++	++++	0

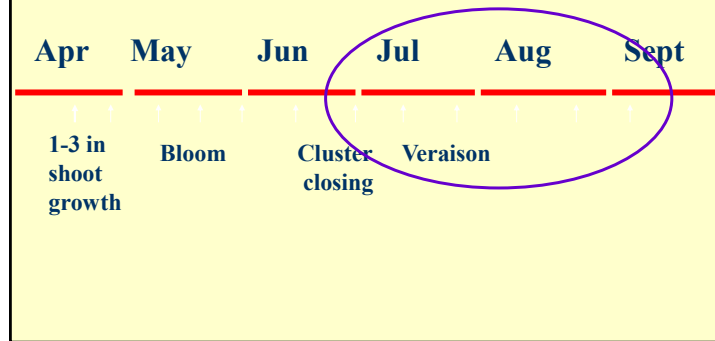
Sour rot

Chemical treatments are not very effective. But.....

Control strategies include:

- variety selection
- reducing damage caused by birds, insects, or diseases (especially powdery mildew)
- strategies that loosen bunches may help.
 - applications of GA
 - leaf pulling or stylet oil applications at trace bloom

Fungicide Spray Program for Bunch Grapes



Cover sprays from post bloom until the preharvest spray

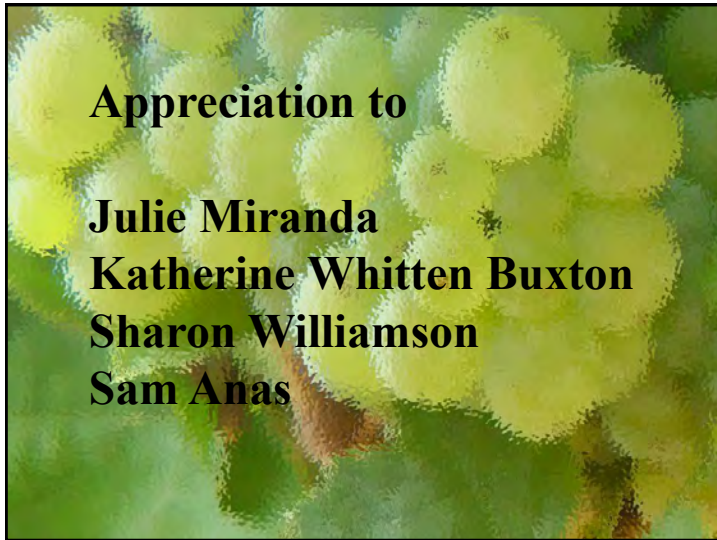
Bitter rot	captan
Ripe rot	+
Powdery mildew *	Quintec or Vivano or sulfur
Downy mildew*	+ phosphite

Veraison

Botrytis	Rovral or
	Vangard or
	Elevate or
	Endura or
	Scala or
	Switch


Preharvest

Bitter rot	captan +
Ripe rot	
Botrytis	Rovral or
	Vangard or
	Elevate or
	Endura or
	Scala or
	Switch
	OR
	Qol

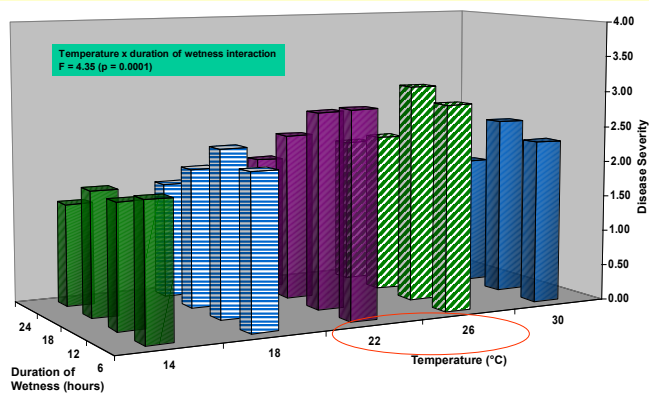


Period of fruit susceptibility in *V. vinifera*

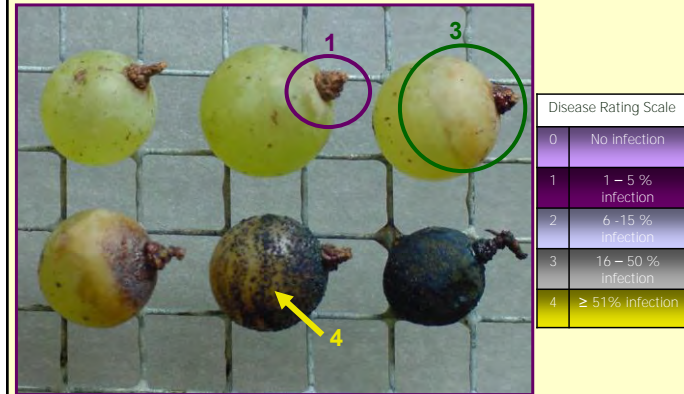
- **Locations**
 - NCDA&CS Upper Piedmont Research Station (Rockingham Co, NC)
 - ‘Cabernet Franc’
 - ‘Chardonnay’
 - Iron Gate Vineyards (Alamance Co, NC)
 - ‘Merlot’
- **Treatments**
 - 5 clusters x 4 cordons x 6 (or 7) inoculation periods (every 2 weeks starting at bloom)
 - Inoculated with spore suspension (10^5 conidia WB5/ml), bagged overnight, and evaluated for disease incidence at harvest.



Influence of temperature and duration of wetness on bitter rot infection



Symptom development



Variety	Species	Brix	Control	Inoculated	Grouping
Cabernet Sauvignon	<i>V. vinifera</i>	22.6	1.64	3.50	A
Petite Verdot	<i>V. vinifera</i>	24.1	0.76	3.32	A
Carlos	<i>M. rotundifolia</i>	20.7	0.92	3.06	AB
Vidal	Hybrid	22.4	0.60	2.58	BC
Cabernet Franc	<i>V. vinifera</i>	20.6	0.14	2.38	BCD
Mataro	<i>V. vinifera</i>	26.2	0.00	2.06	CDE
Sauvignon blanc	<i>V. vinifera</i>	24.0	0.42	1.98	CDEF
Chambourcin	Hybrid	24.7	0.14	1.78	DEF
Tamnat	<i>V. vinifera</i>	21.2	0.16	1.66	EFG
Tempranillo	<i>V. vinifera</i>	24.0	0.14	1.64	EFG
Seyval Blanc	Hybrid	25.4	0.26	1.64	EFG
Covuga White	<i>V. labruscana</i>	18.7	0.00	1.62	H EFG
Chardonnay	Hybrid	21.6	0.16	1.58	H EFG
Touriga Nacional	<i>V. vinifera</i>	22.0	0.00	1.30	HI FG
Supreme	<i>M. rotundifolia</i>	16.2	0.00	1.02	HIJ G
Cynthiana Late	<i>V. aestivalis</i>	26.5	0.22	1.02	HIJ G
Summit	<i>M. rotundifolia</i>	21.4	0.04	0.98	HIJ G
Semillion	<i>V. vinifera</i>	21.7	0.08	0.94	HIJK
Rkatsiteli	<i>V. vinifera</i>	22.0	0.00	0.94	HIJK
Syrah	<i>V. vinifera</i>	20.4	0.14	0.88	IJK
Charbono	<i>V. vinifera</i>	16.1	0.20	0.84	IJKL
Tamimette	Hybrid	21.4	0.04	0.82	IJKL
Barbera	<i>V. vinifera</i>	22.4	0.46	0.74	IKLM
Nesbitt	<i>M. rotundifolia</i>	19.9	0.00	0.64	IKLMN
Ark 1271	Hybrid	23.9	0.28	0.42	IKLMN
Chardonnay	<i>V. vinifera</i>	22.5	0.30	0.26	KLMN
Cynthiana early	<i>V. aestivalis</i>	24.0	0.00	0.24	LMN
Miss Blanc	Hybrid	17.7	0.00	0.12	MN
Merlot	<i>V. vinifera</i>	21.2	0.00	0.06	MN
Pride	<i>M. rotundifolia</i>	18.1	0.00	0.06	MN
Petite Syrah	<i>V. vinifera</i>	21.4	0.00	0.00	N
Sunbelt	<i>V. labruscana</i>	18.6	0.00	0.00	N