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Mt. Vernon

Disease Management: Botrytis in Wet/Humid Climates

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A NOT SO NOBLE ROT

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OVERVIEW

- Botrytis Biology
 - Disease development/cycle
 - Research (past and present)
- Disease Management
 - Cultural Practices
 - Traditional options
 - Organic options

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BIOLOGY-DISEASE CYCLE

Nicholas, et al. 1994

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BIOLOGY-THE BASICS

- Temperature preference: 53-86° F (optimum 64-70° F)
- Needs 1.5 hrs of "leaf wetness"
 - (likes damp conditions)
- A weak pathogen
 - Grows everywhere on dead or dying tissue
 - Infects through injuries/openings
 - PM can enhance BR

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POINTS OF INFECTION

Stamens

Rachises

Berry Caps

Aborted Berries

POINTS OF INFECTION, CON'T



Bunch debris



Wounds



"Mechanical" damage

BIOLOGY-VEGETATIVE TISSUE ATTACK

- Botrytis can occasionally cause flower, leaf and shoot blight
 - Generally in VERY wet years
 - On excessively vigorous vines (control nitrogen levels)



Photos courtesy of www.msu.edu

BIOLOGY-THE WITHIN CLUSTER SPREAD

- Spreads via touching berries
- Longer hang-time = more time for increased infection
 - Use judgment for harvest dates
 - What are the weather conditions going to be?
- Cannot eradicate once established, can only slow the spread

BIOLOGY-THE WITHIN CLUSTER SPREAD



**DISEASE MANAGEMENT:
BOTRYTIS BUNCH ROT**



DISEASE MANAGEMENT- CULTURAL PRACTICES

- Drip vs. mist vs. overhead irrigation
- Canopy manipulation can help!
- Reduce humidity, reduce drying time
- Ways to do this:
 - Managing canopy vigor
 - Shoot thinning (canopy density)
 - Leaf pulling- timing and amounts

Open Canopy= Better spray deposition + air circulation + light penetration

DISEASE MANAGEMENT- CULTURAL PRACTICES

- Leaf Pulling
 - Directed at the fruiting zone
 - Previous practice was from set – veraison
 - Current research focuses on prebloom-set

DISEASE MANAGEMENT-LEAF PULLING



DISEASE MANAGEMENT- CULTURAL PRACTICES

- Leaf Pulling
 - Directed at the fruiting zone
 - Previous practice was from set – veraison
 - Current research focuses on prebloom-set
- CAUTIONS
 - Leaf pulling late can cause sunburn
 - Costly
 - Too much leaf removal too early can reduce set

DISEASE MANAGEMENT-LEAF PULLING



Photo courtesy of Dr. Craig Austin

DISEASE MANAGEMENT- CULTURAL PRACTICES



Shoot thinning, positioning, and general canopy management are also crucial



If you can't see the fruit zone, neither can a sprayer...

DISEASE MANAGEMENT- SUSCEPTIBILITY

- Judging vine susceptibility for Botrytis bunch rot is not easy.
- Usually based on:
 - Cluster architecture and compactness
 - Tendency to swell and split
 - Powdery mildew susceptibility
 - Insect and animal feeding preference



DISEASE MANAGEMENT- SUSCEPTIBILITY

Susceptible	Moderately Susceptible	Low Susceptibility
Chardonnay, Chenin blanc, Vignoles, Grenache, Pinot noir, Pinot gris, Riesling, Sauvignon blanc, Traminer, Barbera, Grenache, Petite syrah, Zinfandel, Seyval blanc, Baco noir, Semillon*, Cabernet sauvignon*, Cabernet franc*	Semillon*, Sangiovese, Vidal blanc	Cabernet sauvignon*, Merlot, Cabernet franc*

The problem with generalizations...

Question:

What should you consider when selecting clones?

DISEASE MANAGEMENT- MONITORING INFECTIONS

- Sample green and coloring clusters (~15-30)
- Place in a wet plastic bag; seal
- Freeze/incubate at room temperature
- Clusters with Botrytis infections will show sporulation in 1-3 days
 - Incidence and severity will vary
 - If more than 1/3 of bunches in sprayed* vineyard are sporulating, contact extension agent

DISEASE MANAGEMENT- FUNGICIDE CHOICES

Class	Trade Name	Common Name	Resist. Risk	Type
Carboximide	Captan 50WP	Captan	Low	Protectant
Anilinoimidazole	Vanguard	Cyprodinil	High	Protectant/postinfec.
Anilinoimidazole	Scala	Pyrimethanil	High	Protectant/postinfec.
Dicarboximide	Rovral	Iprodione	High	Protectant/postinfec/antispor.
Strobilurin/ carboxin	Pristine	Pyraclostrobin/ boscalid	High	protectant/antispor.
Strobilurin	Flint	Trifloxystrobin	High	Protectant; higher rate than for PM
Carboxin	Endura	Boscalid	High	Protectant/postinfec; higher rate than PM
Hydroxalanilide	Elevate 50WDG	Fenhexamid	Mod.	Protectant; some PM control, limit sprays
Sterol inhibitor	Elite 45 DF	Tebuconazole	Mod	Post-infec; antisporul.

DISEASE MANAGEMENT- DUAL FUNGICIDES

Class	Trade Name	Common Name	PM Rate (oz/A)	Bunch Rot Rate (oz/A)
Strobilurin/ carboxin	Pristine	Pyraclostrobin/ boscalid	1.5-2.0	3.0
Strobilurin	Flint	Trifloxystrobin	8.0-10.5	12.5
Azole/ Anilinoimidazole	Inspire Super	Difenoconazole/ cyprodinil	16-20	

USE CAUTION- RESISTANCE AND RATES MATTER

Courtesy of Dr. Wayne Wilcox, Cornell University-NYSAES

DISEASE MANAGEMENT: ORGANIC OPTIONS

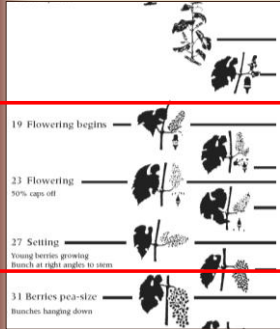
Class	Trade Name	Common Name	Resist. Risk	Type
Copper		Copper hydroxide	Low	Protectant/postinfec. (slow drying conditions increase injury risk)
Biologicals	Serenade Sonata	Bacillus subtilis Bacillus pumilis	Low ? Low ?	??

GENERALIZED SPRAY PROGRAM:

BOTRYTIS BUNCH ROT

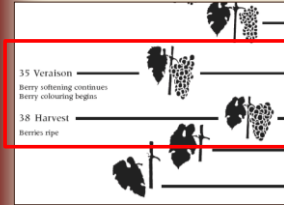


DISEASE MANAGEMENT- GENERAL SPRAY PROGRAM



- Latent Infections:
 - Infections here are not expressed until veraison
 - Infects through stamens/scars
 - Bloom spray at cluster zone
 - Monitor weather conditions

DISEASE MANAGEMENT- GENERAL SPRAY PROGRAM



- Fruit Rot
 - Latent infections expressed
 - New infections on ripening clusters
 - Infections spread quickly within cluster
 - Monitor weather
 - Spray at first signs (do not wait!)

REVIEW AND CONCLUSIONS

- Biology and history
- Implications in viticulture and enology
- Managing outbreaks in cool, wet climates
 - Focus of spray programs
 - Viticultural practices

WEBSITES

- Washington State University
 - www.wine.wsu.edu/research-extension/
- Oregon State University
 - www.ipmnet.org
- Cornell University
 - www.nysaes.cornell.edu
- Ontario Ministry of Ag.
 - www.omafra.gov.on.ca/
- BC Ministry of Ag.*
 - www.agf.gov.bc.ca

QUESTIONS?

