

Spring Vine Health Field Day Canberra Region



Botrytis & other bunch rots

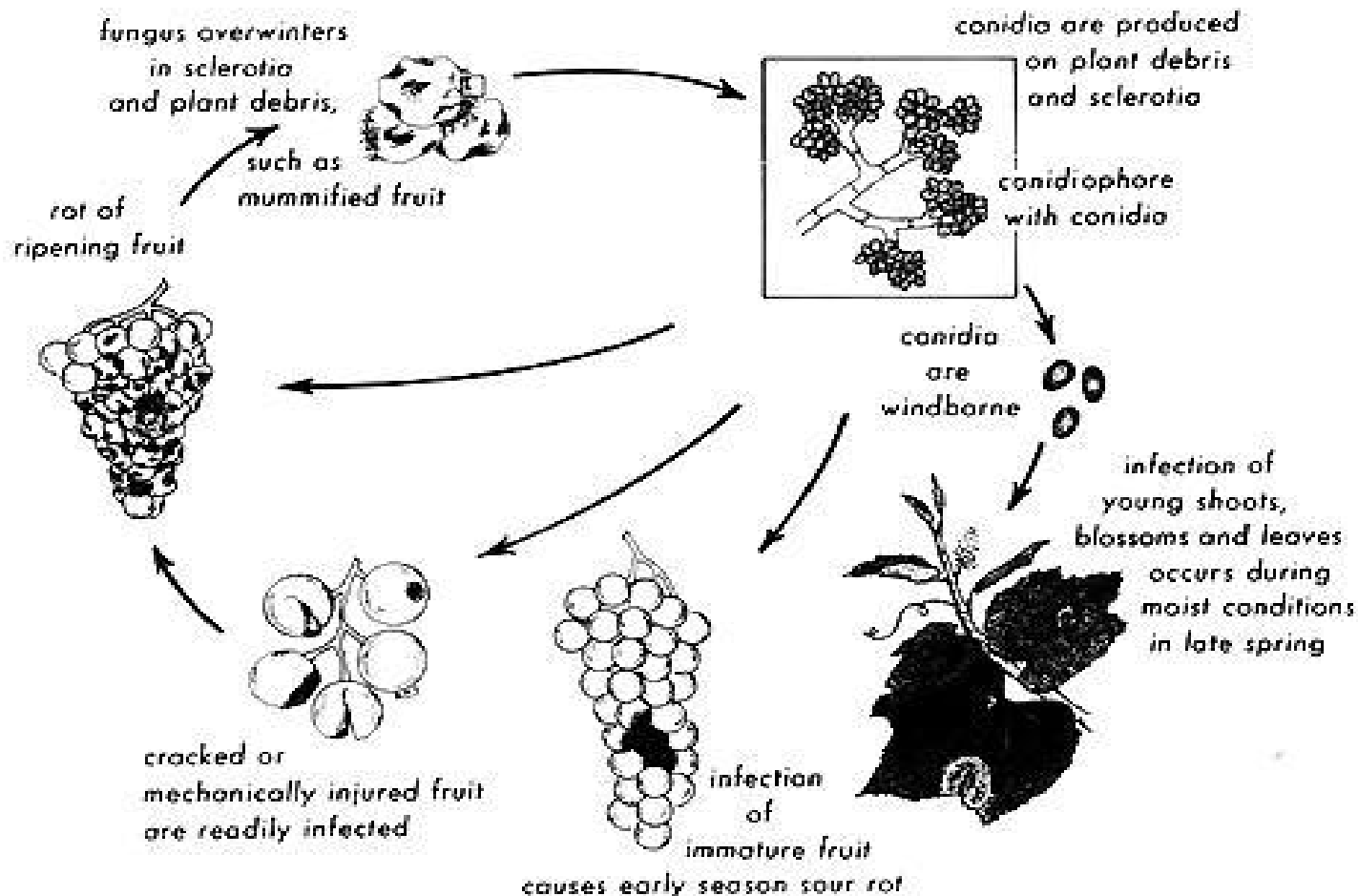
by Dr Mary Cole



Saturday 4th September 2010
Grazing Restaurant
The Royal Hotel
GUNDAROO ACT



Disease cycle of Botrytis – similar for some other bunch rots



**Disease cycle of Botrytis
bunch rot on grape.**

Developing inflorescence

- Caps on – no damage
- Environmental infections from *Botrytis* unlikely
- *Penicillium* spp.
sometimes found in & on developing rachis
- *Cladosporium* sp
- *Epicoccum* sp



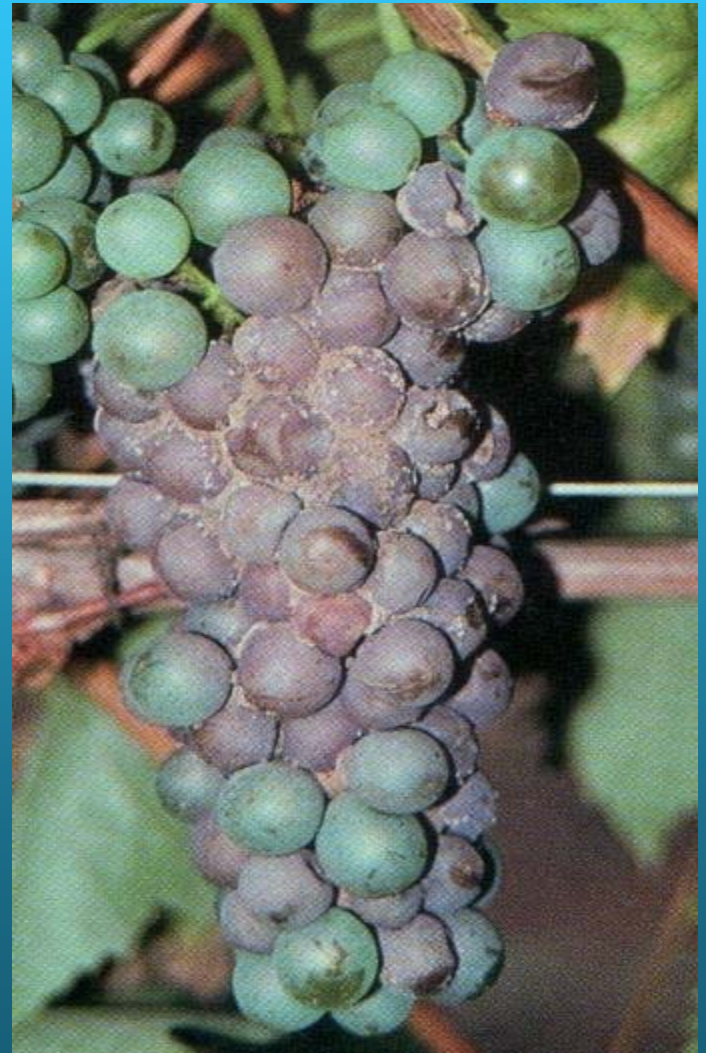
Caps loosening

- Botrytis can infect if fogs, heavy dew or rain is present
- Environmental fungi include:
 - *Penicillium* spp.,
 - *Epicoccum* sp.,
 - *Cladosporium* spp.



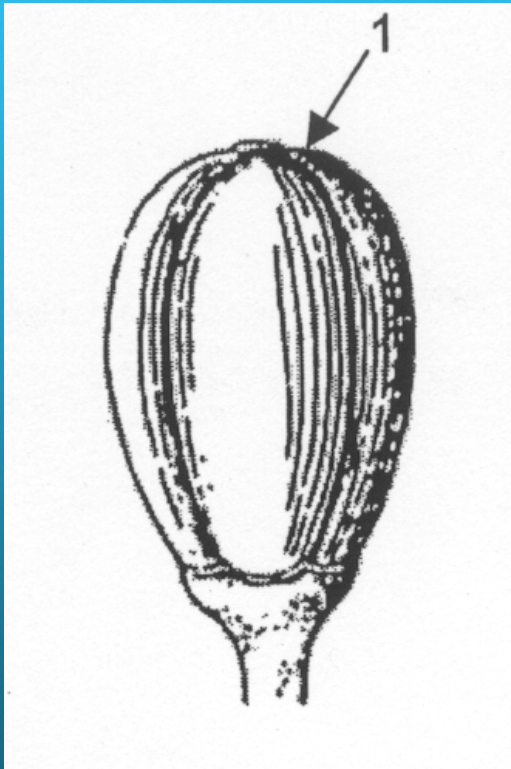
Bunch rots present at Veraison

- Fungi present on this bunch:
- *Botrytis cinerea*
- *Rhizopus stolonifer*
- *Cladosporium* sp
- *Epicoccum nigrum*
- *Penicillium* sp
- *Mucor* sp
- *Trichoderma* sp
- *Gliocladium* sp
- *Aspergillus niger*

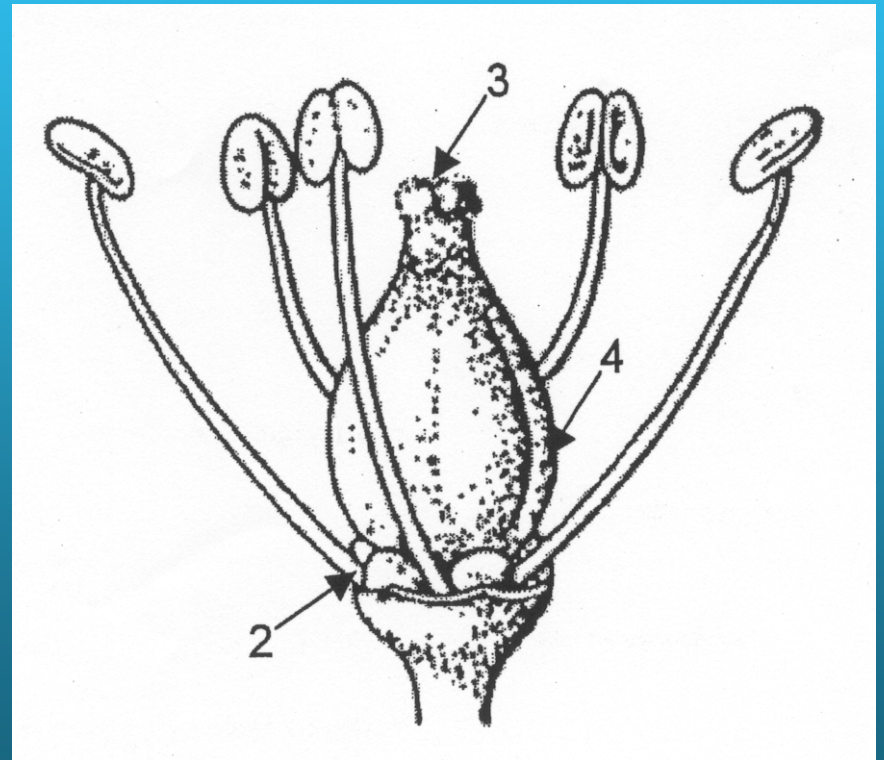


Flower anatomy

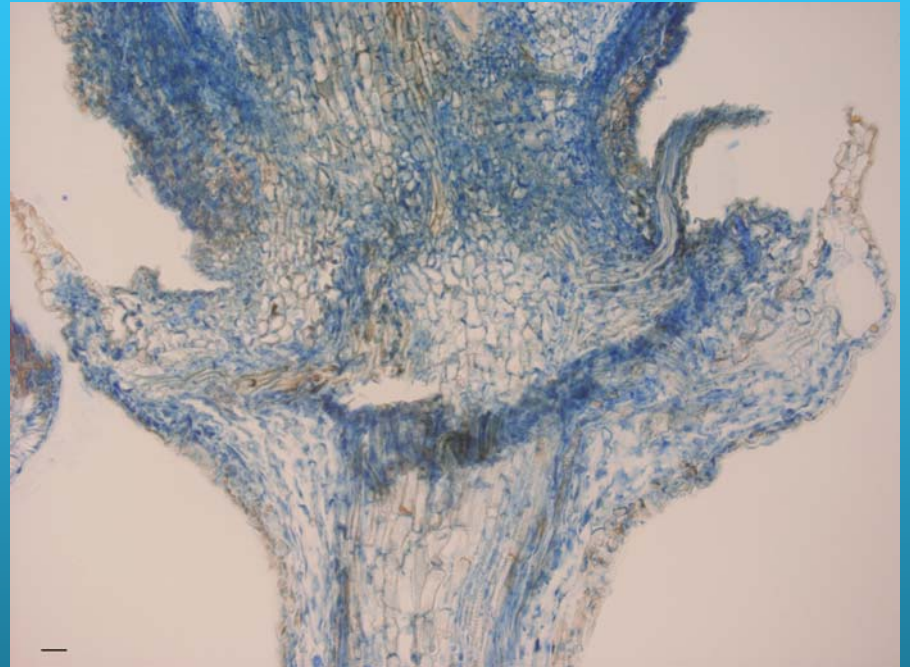
- Pre-bloom



Bloom

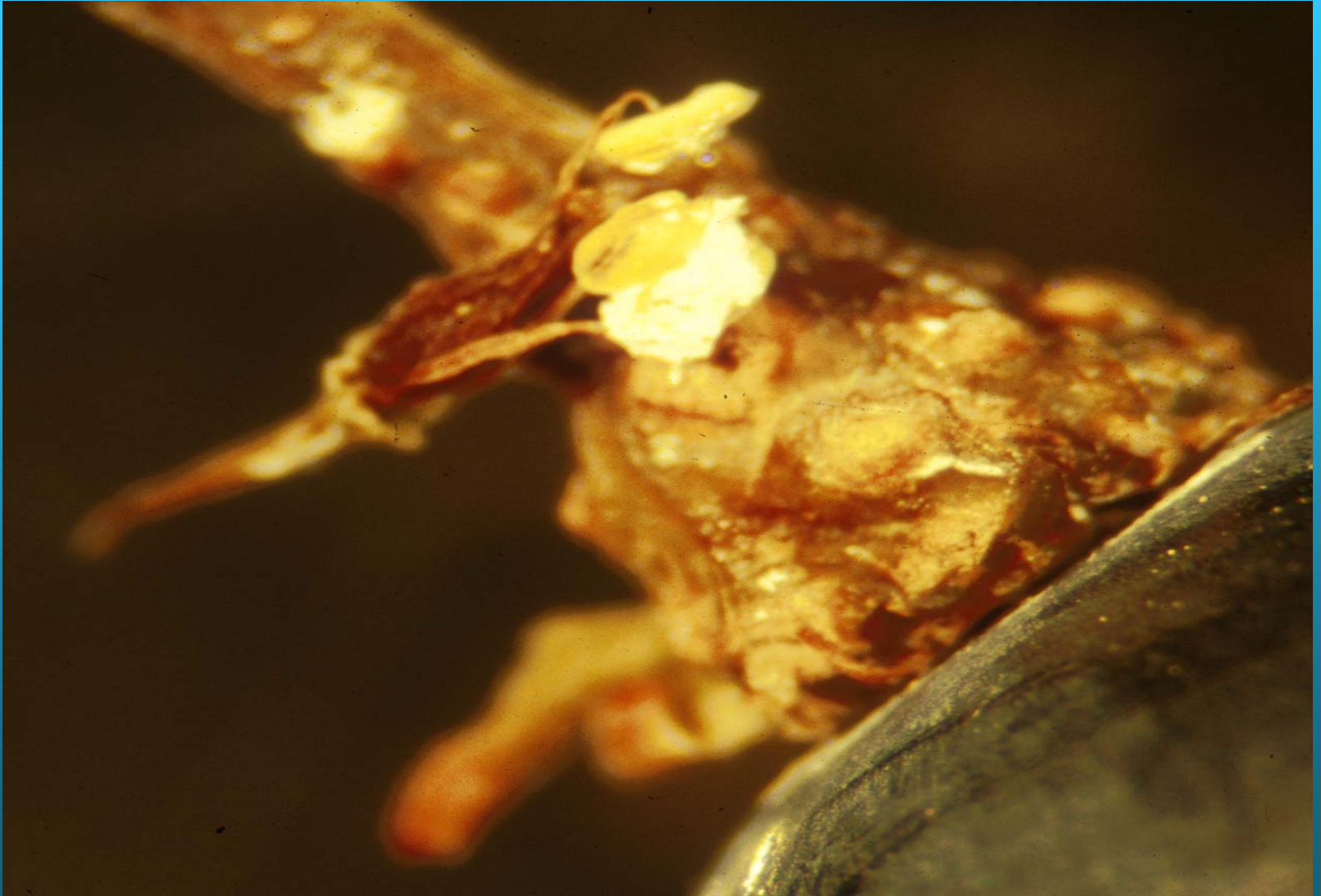


Receptacle Infection Pathway

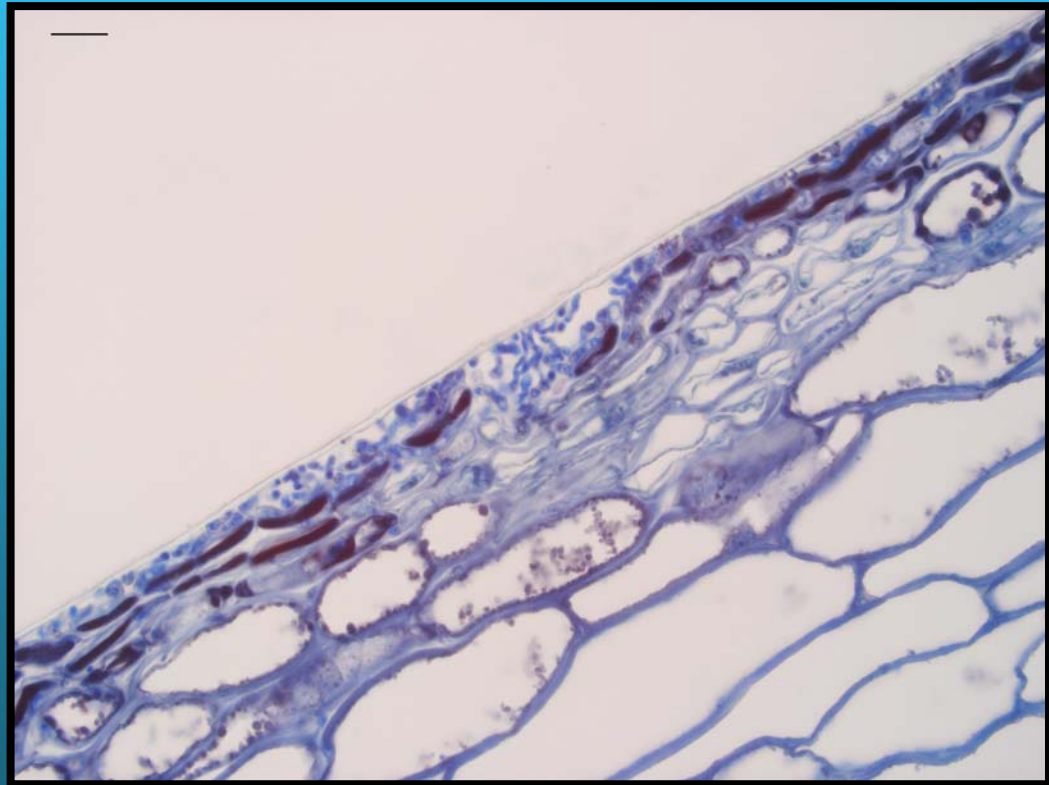
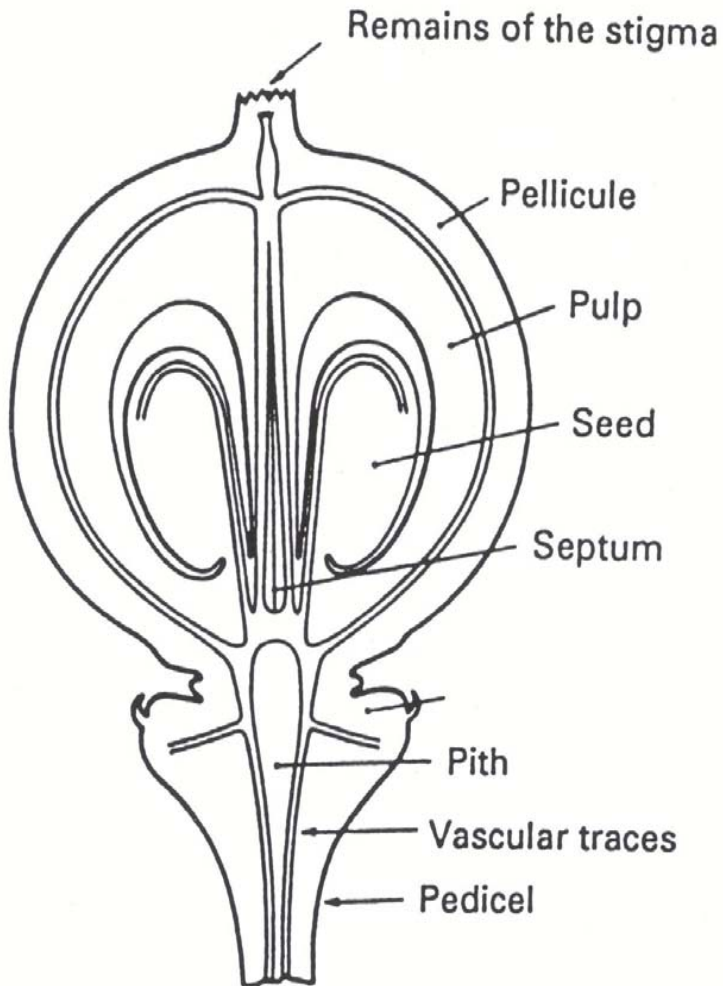


Pezet, Viret, Cole 2003

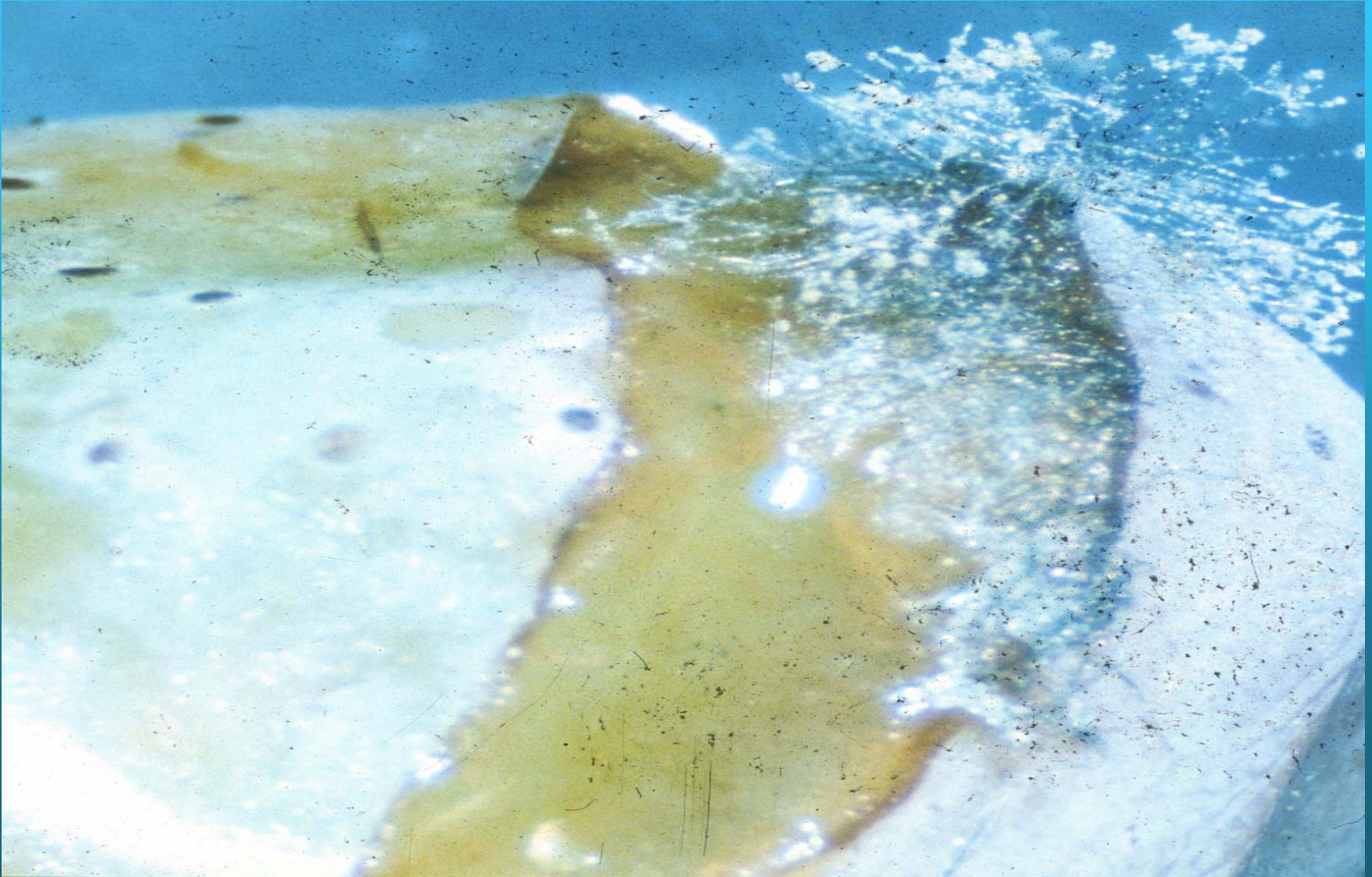
Botrytis infection point



Berry Anatomy - slip skin

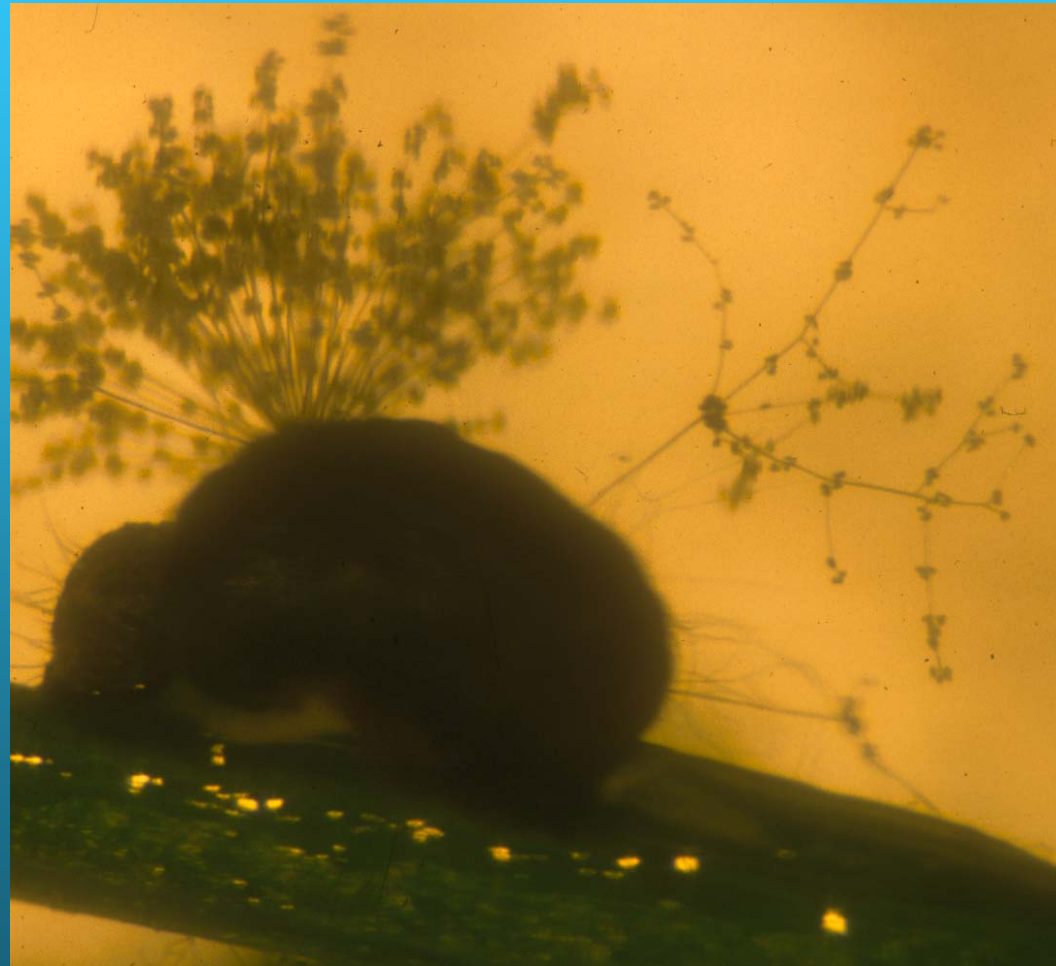


Harvest berries - slip skins



Over wintering fungi

- Fungi found:
- *Alternaria* spp.,
- *Trichoderma* sp.,
- *Botrytis cinerea*
- *Cladosporium* sp.,
- *Epicoccum* sp.,
- *Rhizopus* sp.,
- *Gliocladium* sp
- *Stemphylium* sp.



Development of Bunch Rots

Favoured by:

- Cool or warm temperatures
- High humidity
- Long periods of free moisture on berries
- Large canopies
- Heavy cropping
- Excessive shading reduces light levels and temperature in the bunch zone

Factors that reduce Bunch Rots

- Shoot & leaf plucking
- Exposure of the fruit zone
- Careful watering
- Minimising damage from equipment, raising fruiting wires, LBAM
- RESULTS IN:
- Earlier ripening

Botrytis – the pathogen

❖ CONCLUSION :

➤ Expression:

❖ Weather or inoculum?

➤ Late infection:

❖ Through wounds –birds, rubbing, berry pressure, debris in the bunch

Other Bunch Rots

- Generally results from damaged bunches
- High sugar leakage from bunches
- Can be present from flowering
- Management similar to that of Botrytis

**Variety
selection**

Irrigation

**Canopy
management**

**Vineyard
Hygiene**

**Damage
control**

Botrytis management checklist

- *Botrytis management includes vineyard management.*
- Pest & disease monitoring;
- Canopy assessments (pruning weights, shoot counts);
- Soil/nutrient analysis;
- Fertiliser application;
- Soil moisture monitoring;
- Irrigation/rainfall;
- Yield estimation;
- Harvest assessment of damage;
- Vine growth stage assessment, ie when 80% capfall occurs.

Pruning

- *Last year, did you have:*
- Botrytis problems – poor site?
- High vigour & dense canopy?
- High crop load?
- LBAM damage?
- Chemical control failure?
- Infection sources present?

Early season

- *Last year, did you have:*
 - High vigour & dense canopy?
 - High crop load?
 - Bunch congestion?
 - Vine damage
- eg LBAM present; other diseases; physical ?

Flowering

- *Last year, did you have:*
- High vigour & dense canopy?
- Damage from LBAM; powdery mildew?
- Chemical failure?

Berry set - pre-bunch closure

- *Last year, did you have:*
- High crop load?
- High vigour & dense canopy?
- Bunch congestion?
- Tight bunches, large berries?
- Berry damage

Eg LBAM present; powdery mildew; physical; sunburn;
chemicals?

Infection sources?

Veraison

- *Last year, did you have:*
- High crop load?
- High vigour & dense canopy?
- Bunch congestion?
- Tight bunches, large berries?
- Berry damage

Eg LBAM present; powdery mildew; physical; sunburn;
chemicals?

Infection sources?

Pre-harvest

- *Last year, did you have:*
- High crop load?
- High vigour & dense canopy?
- Bunch congestion?
- Berry damage

Eg LBAM present; birds; physical including hail;
sunburn;?

Chemical failure?

Infection sources?

Harvest

- *Last year, did you have:*
- Berry damage?
- Infection sources?

Spray program - chemical

- Routine or strategic?
- Chemical application – only as good as equipment – ie is spray equipment correctly calibrated?
- Canopy penetration – bunches behind posts; inside dense canopy?
- Why then do chemicals fail to stop disease outbreaks such as Botrytis?

Impact of chemicals on microflora

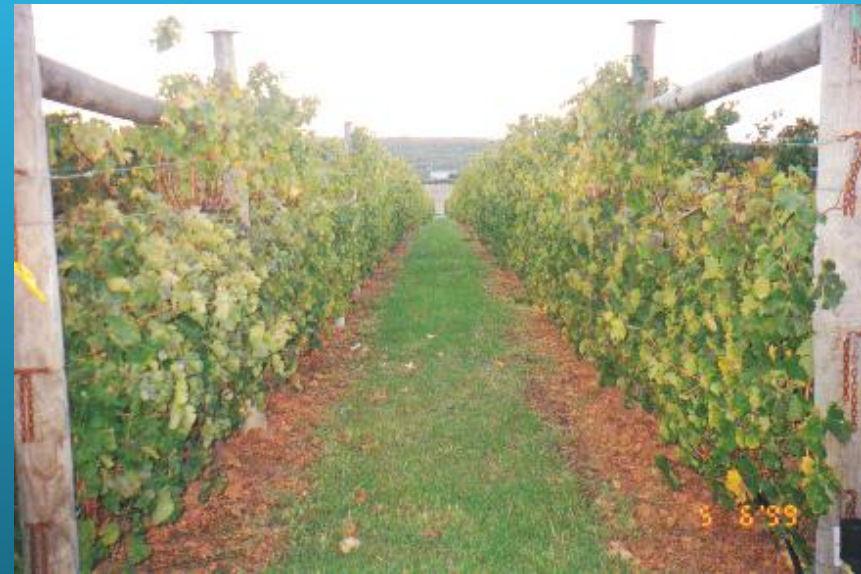
- *Chemicals affect:*
- target organisms
- Beneficials
- Chemicals do not target all infection sites in vineyard eg botryticides
- Long term use of chemicals affects biological diversity

Alternative pest & disease management programs

- Organic – all diseases and pests can be managed by organic/biological means.
- Biodynamic – Formula 500 is the most useful in Australia.
- *Soil foodweb can serve both paradigms* - looks at total soil biota not just what can be cultured. Uses fluorescent techniques for bacteria and fungal numbers.

Organic viticulture

- Vineyard management.
- Vine management – canopy, watering, fruit load.
- Alternative products – commercial – ask for data on efficacy – carry out test panels/rows?
- SFI base line tests for biota activity and ratios.
- Compost – what is compost?
- Mulch – what is mulch?



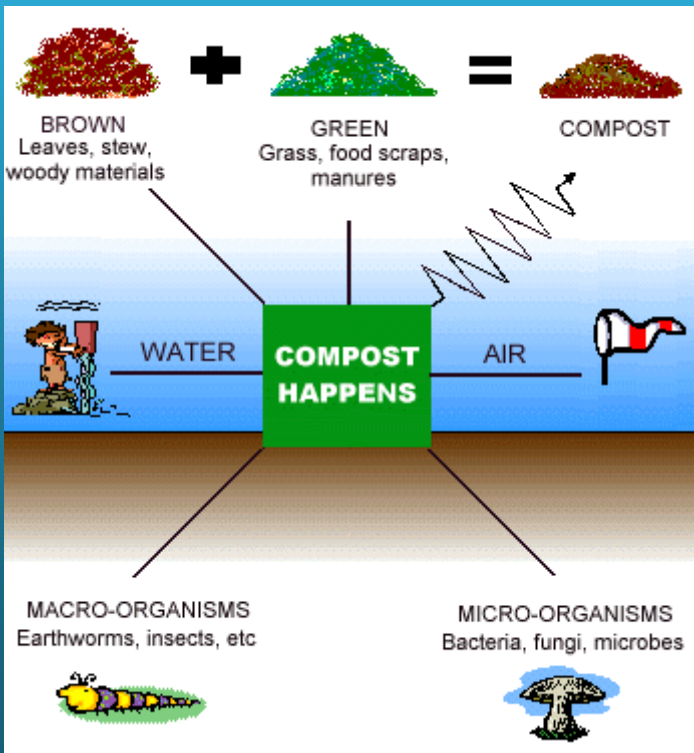
Mulch

- Mulch – organic material chopped into small pieces – few mms to a few cms – *be careful of fresh resinous material.*
- Apply as weed mat; Moisture protector; Soil structure improver.



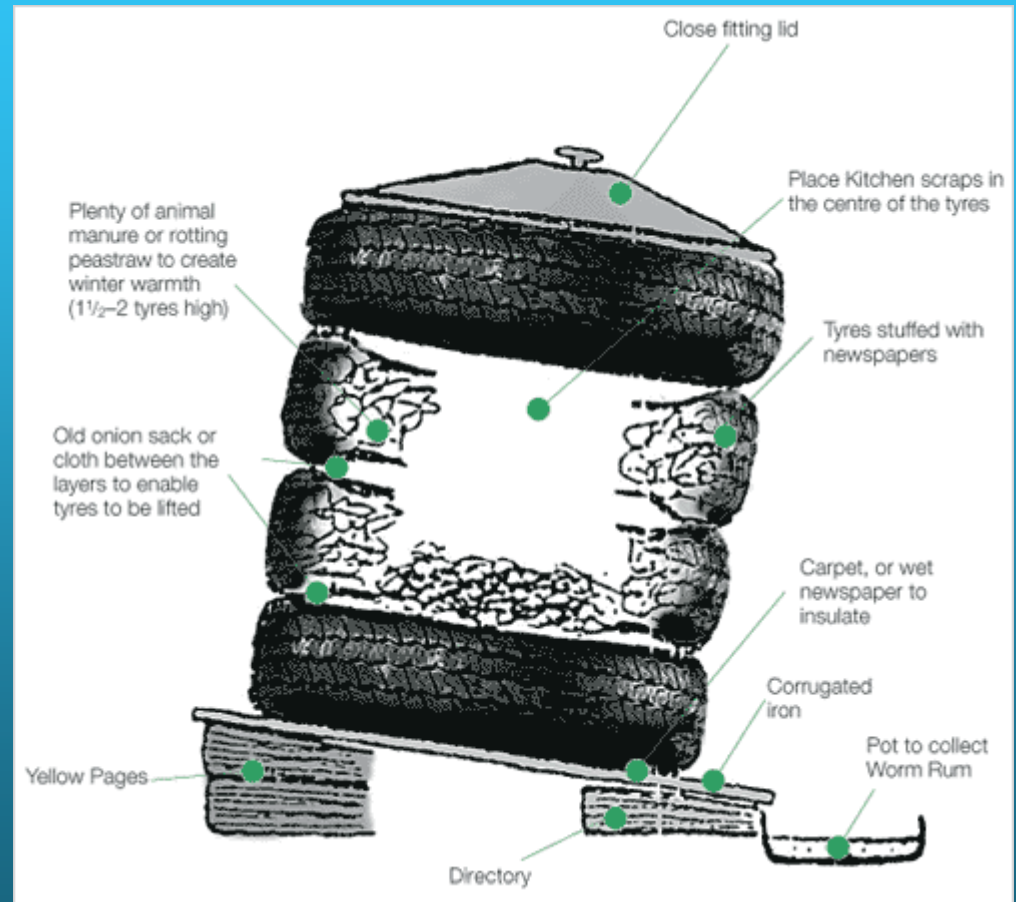
Compost

- Composting is the controlled decomposition of organic material under aerobic conditions.



Leachates - what are they?

- Worm juice.
- Some compost teas.
- What value are they?



Soil Foodweb Institute, P/L

- www.soilfoodweb.com - Dr Elaine Ingham - Corvallis, Oregon, USA
- www.agpath.com.au - Dr Mary Cole

Soil health

Disease protection - minimises the need for pesticides

Nutrient immobilization – reduces leaching

Nutrient availability - optimal forms in the right place at the right time

Decomposition of toxins - removes harmful residues

Root health, root depth, water retention, aerobic conditions in soil and improved soil structure –
less watering needed, lessen your dependence on fertilisers

How does this help your vineyard?

- *Reduces costs* – fertiliser, pesticides, herbicides, fungicides.
- *Improves environment* – brings back bio-diversity on vines and in soil no waste water or organic matter.
- *Improves crop quality* – more fertile soil > better quality fruit.
- *Improved sales potential* – consumer looking for sustainable produce.

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