



Management of grapevine diseases

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Basic principles

Best coverage possible ✓



Optimum timing ✓



- The biology of each pest drives the spray program



Most suitable chemical ✓

Right part of the canopy ✓



Basic principles – The Four T's

Technique



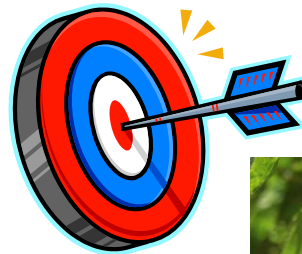
Timing



Treatment



Target



Targets vary with season

- At each stage, the canopy and the biological targets change:
 - 1. Budburst
 - 2. Early season
 - 3. Flowering
 - 4. Berries pea-size to bunch closure
 - 5. Veraison to harvest

1. Budburst



1. Budburst – protect against



Mites



Powdery mildew flag shoots



Powdery mildew infection from overwintering chasmothecia

1. Budburst – targeting the canopy



Cordon can absorb a large volume.



Very narrow target! Do you really need air?



Broad target on minimally pruned vines volume.



2. Budburst to flowering



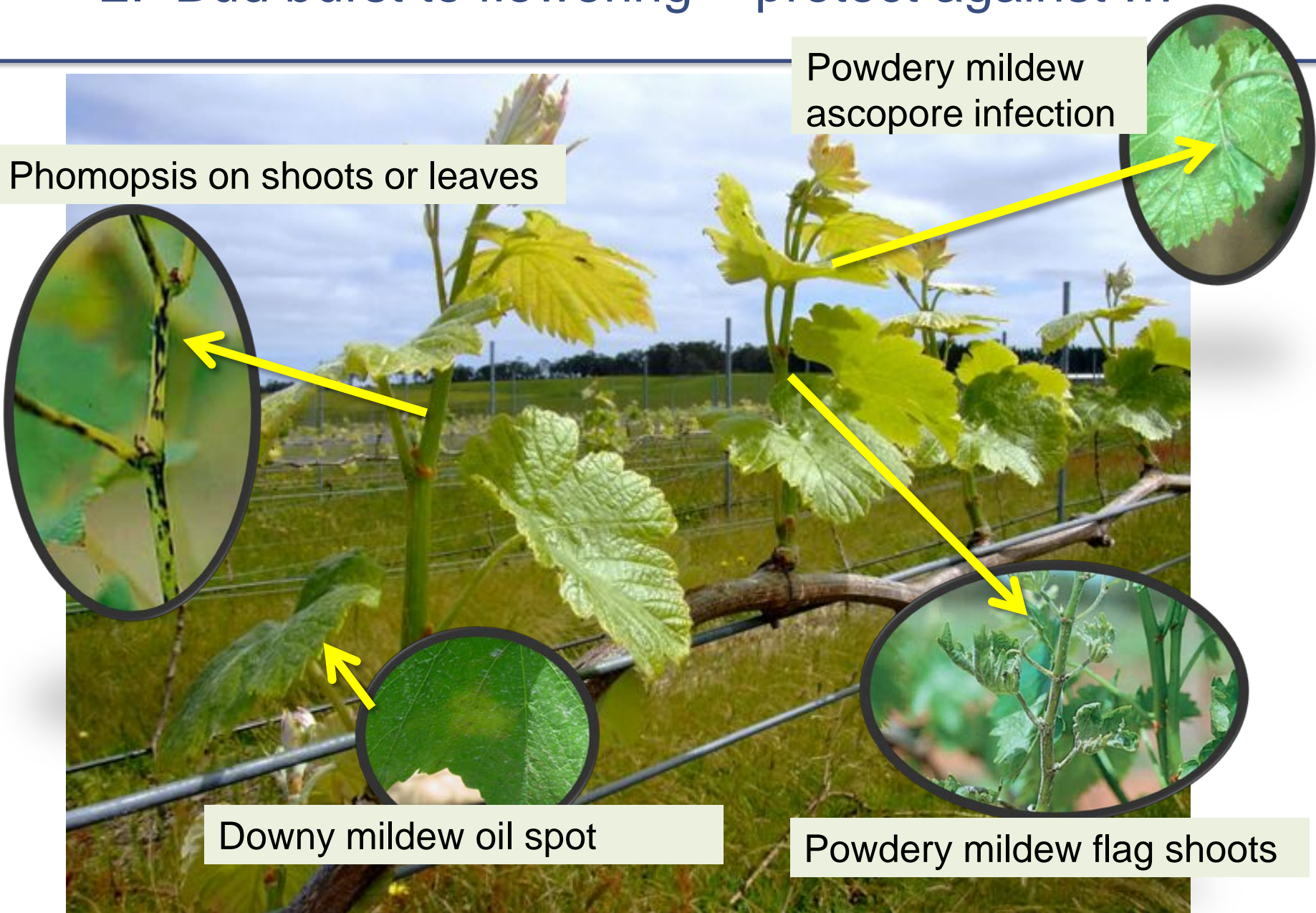
2. Bud burst to flowering - protect against ...

Phomopsis on shoots or leaves

Powdery mildew
ascospore infection

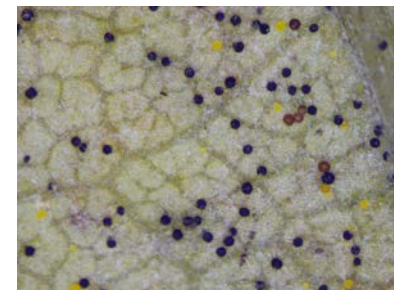
Downy mildew oil spot

Powdery mildew flag shoots

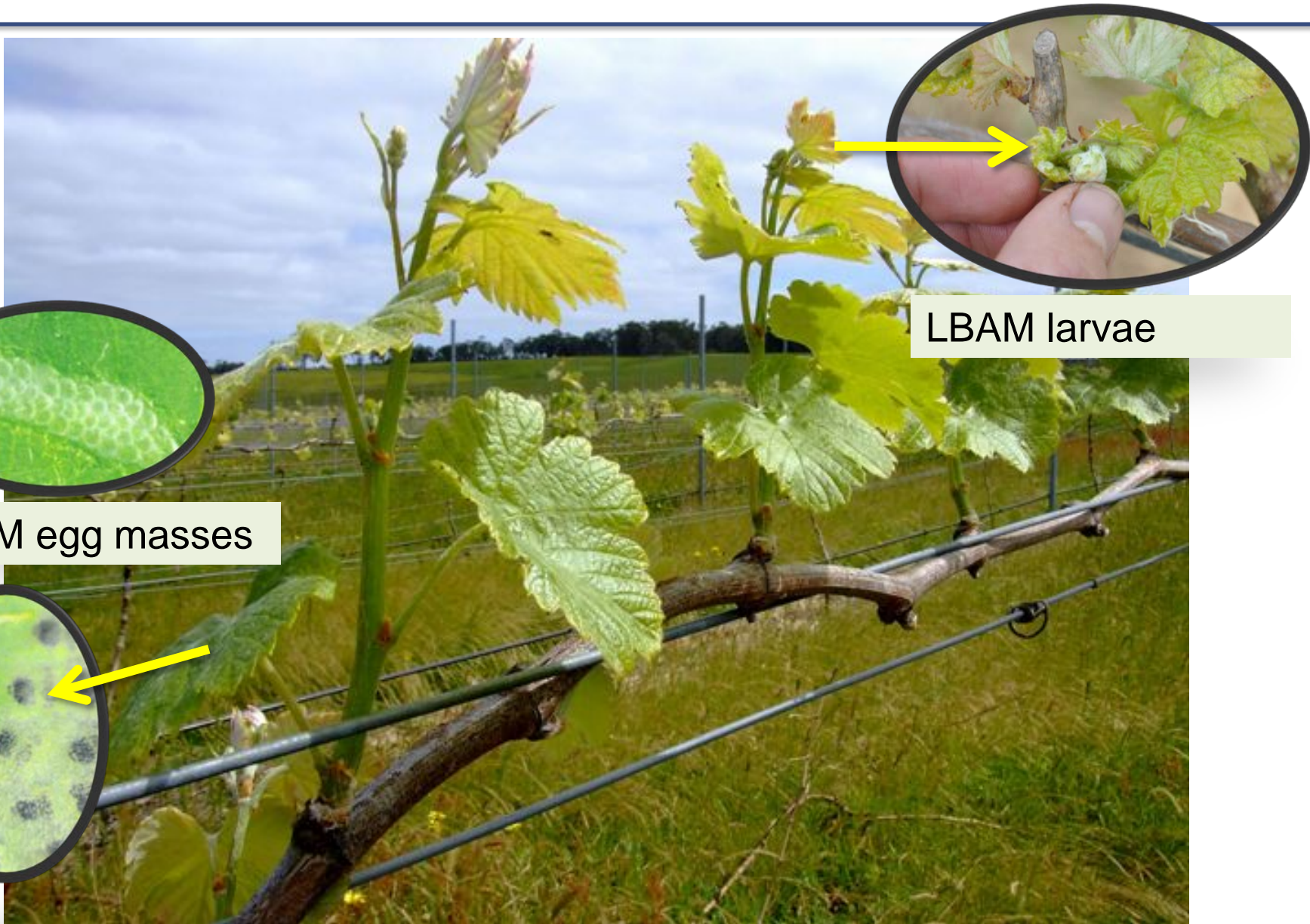


Critical spray times

- Powdery mildew



2. Bud burst to flowering - protect against ...

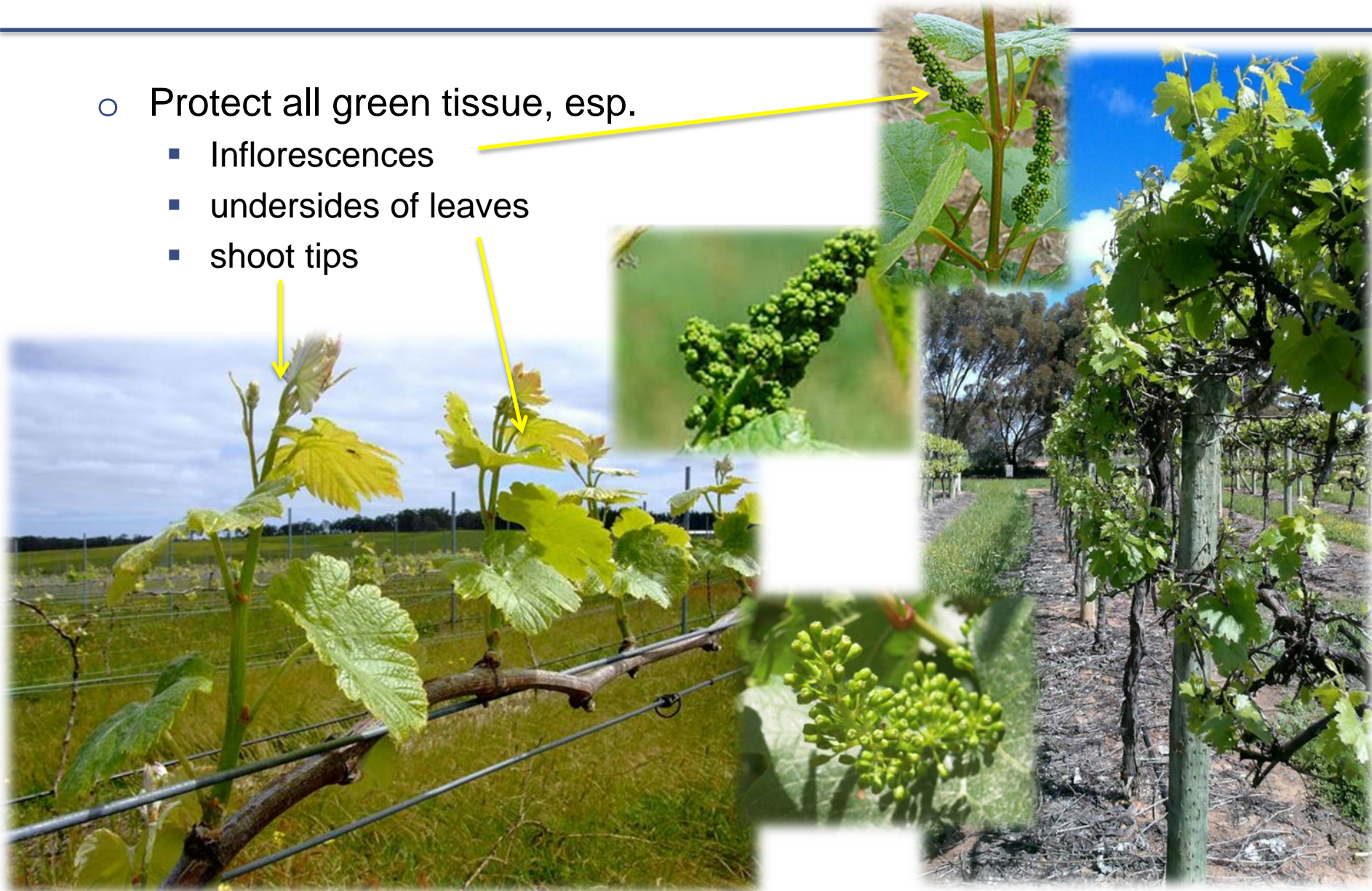


LBAM larvae

LBAM egg masses

2. Bud burst to flowering – targeting the canopy

- Protect all green tissue, esp.
 - Inflorescences
 - undersides of leaves
 - shoot tips



3. Flowering



3. Flowering - protect against ...

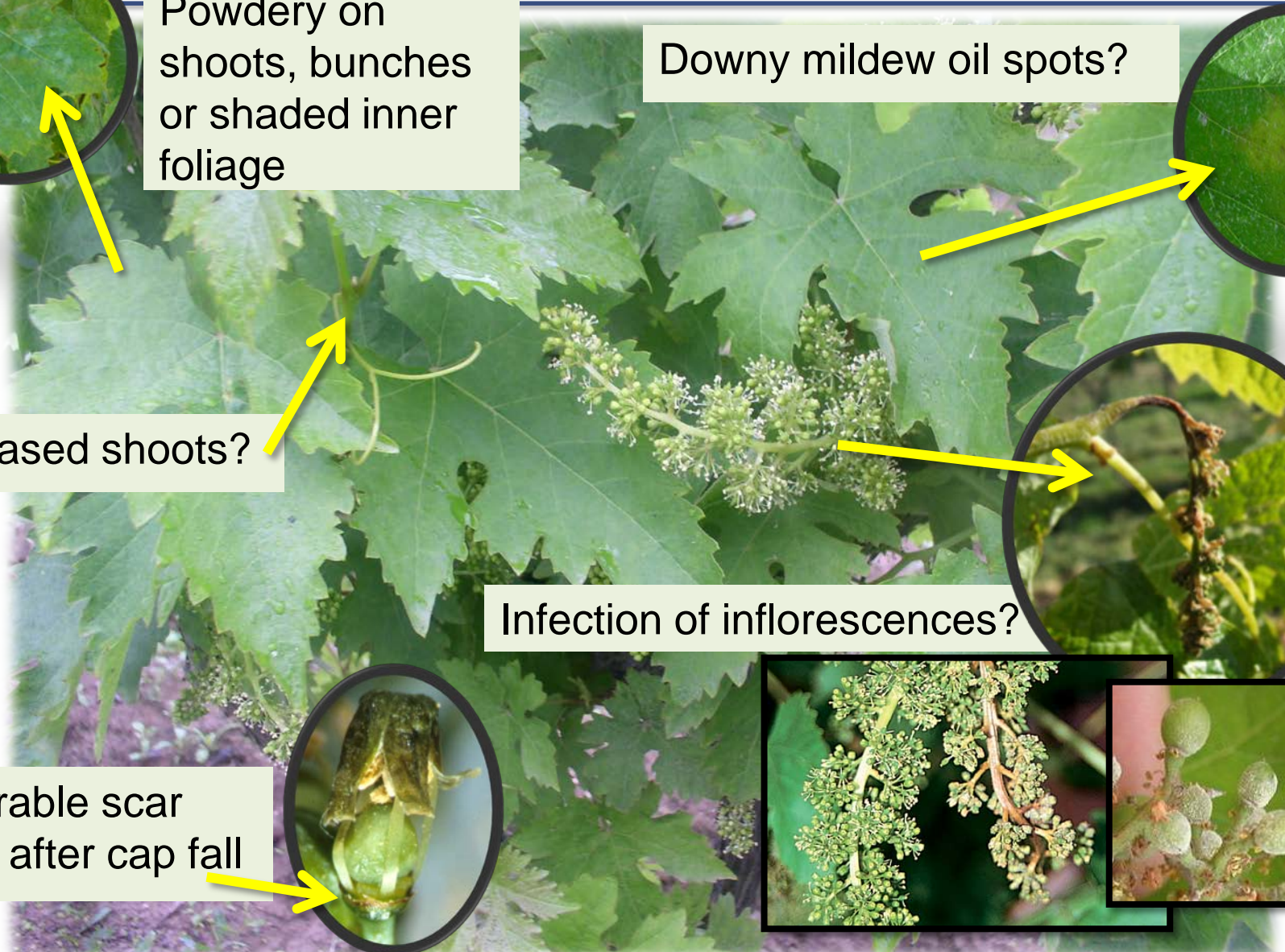
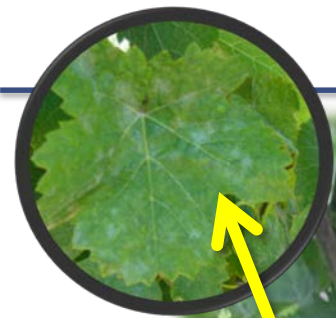
Powdery on shoots, bunches or shaded inner foliage

Downy mildew oil spots?

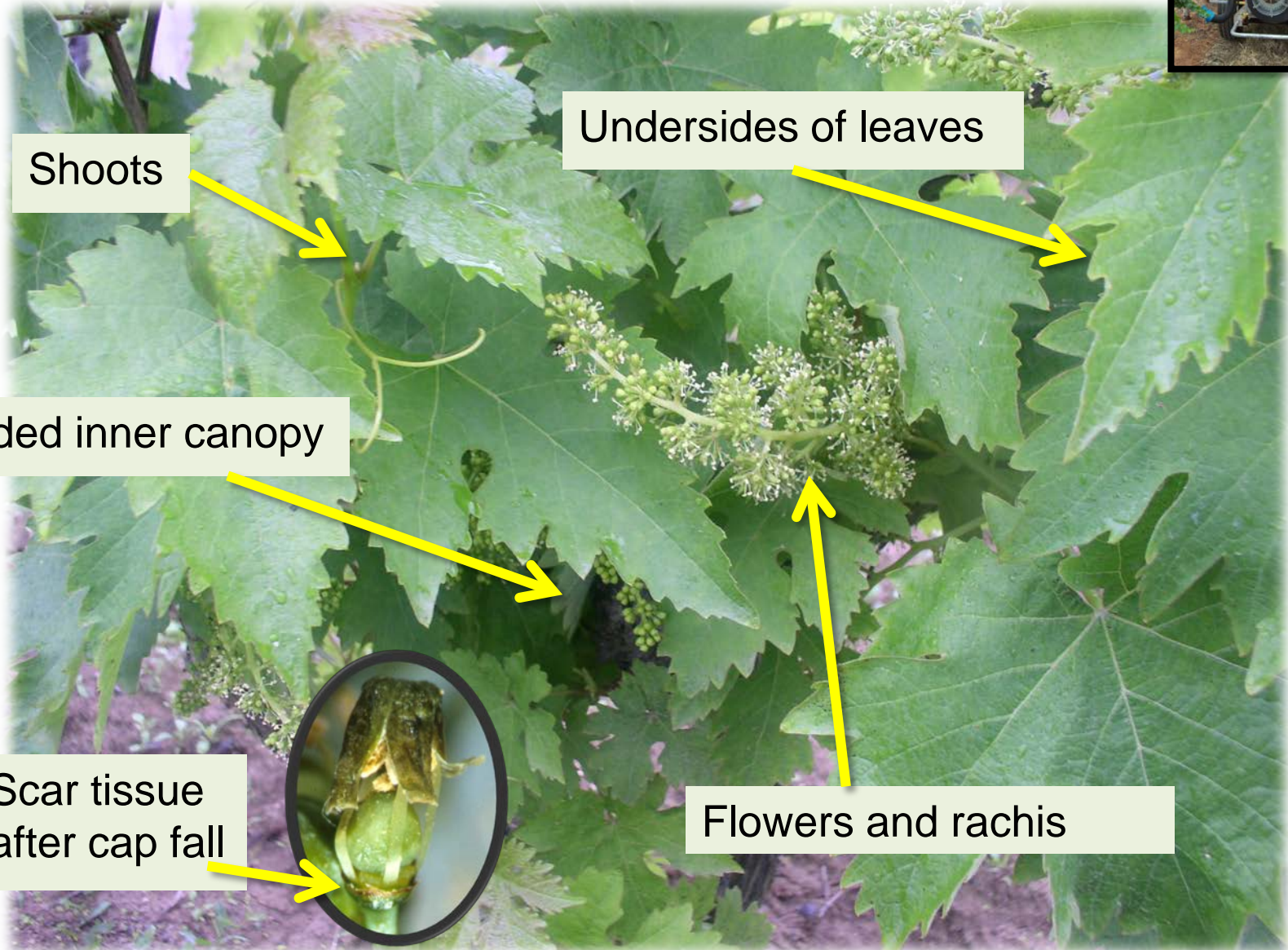
Diseased shoots?

Infection of inflorescences?

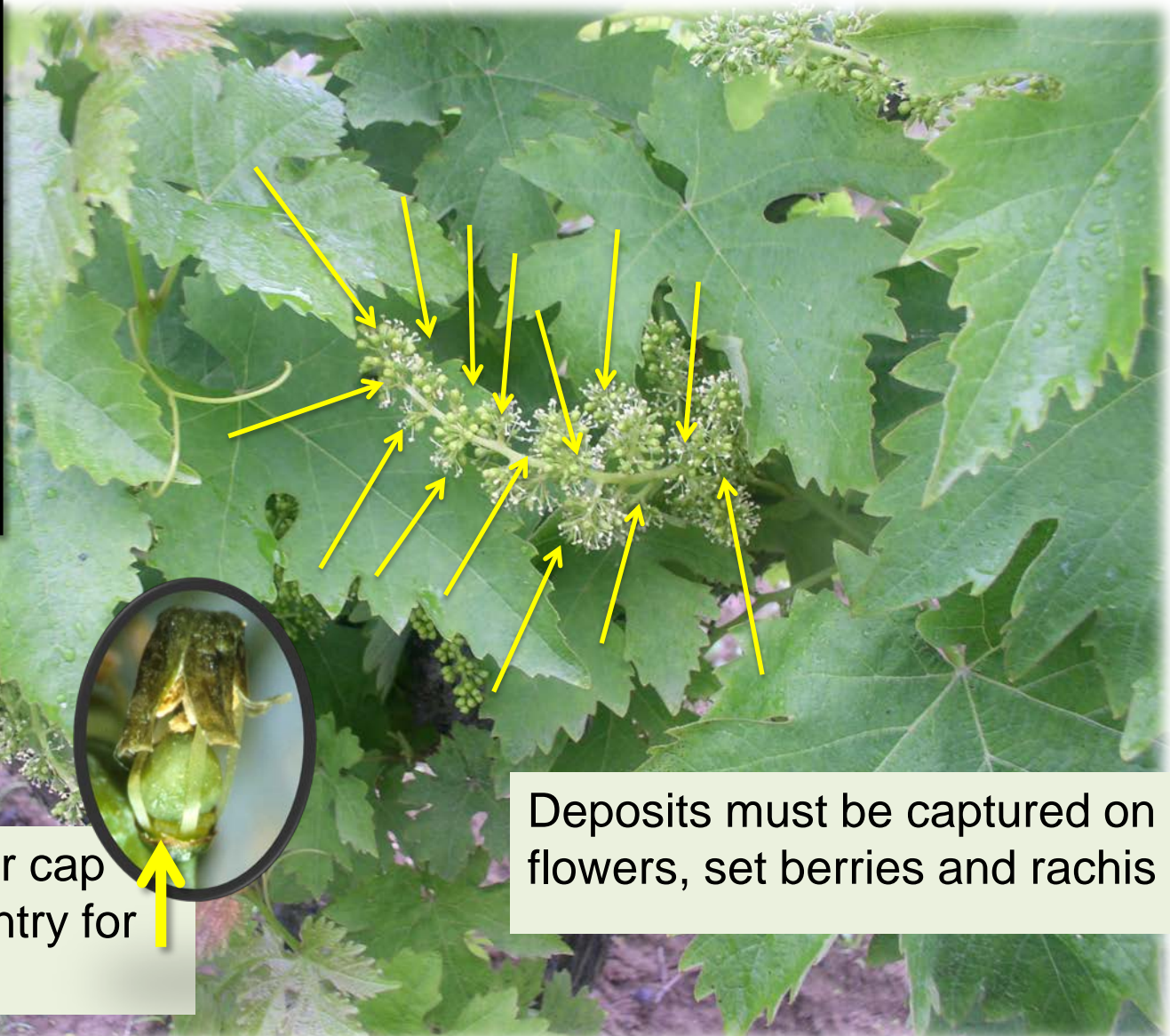
Vulnerable scar tissue after cap fall



3. Flowering - targeting the canopy



More specifically - targeting flowering bunches



Scar tissue after cap fall is point of entry for Botrytis

Deposits must be captured on flowers, set berries and rachis

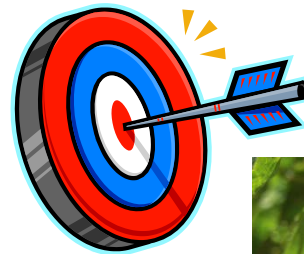
Spraying bunches at flowering is a challenge



Timing



Best coverage possible
= Technique



Target

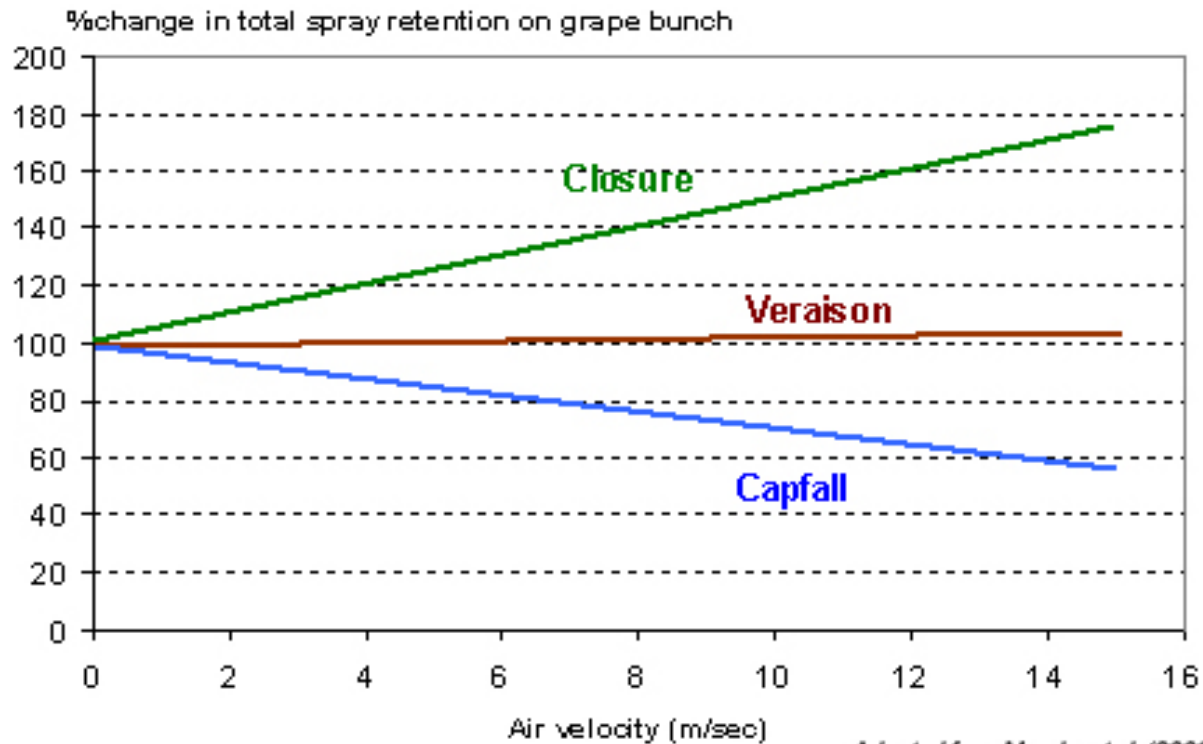


Most suitable chemical
= Treatment

Flowers & air velocity



Effect of air velocity on spray retention in grape bunches



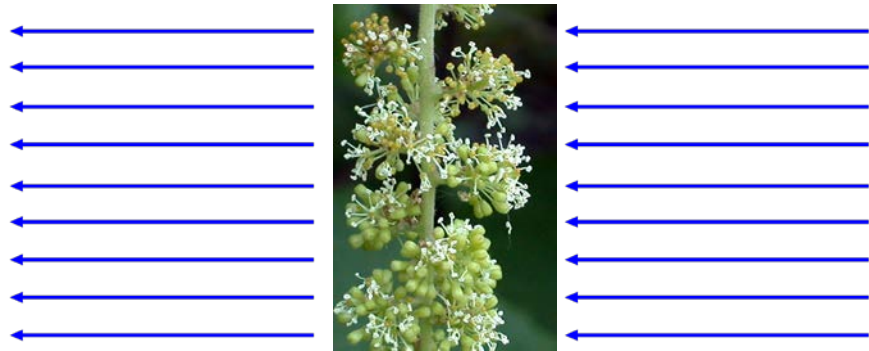
Air flow around a flowering bunch



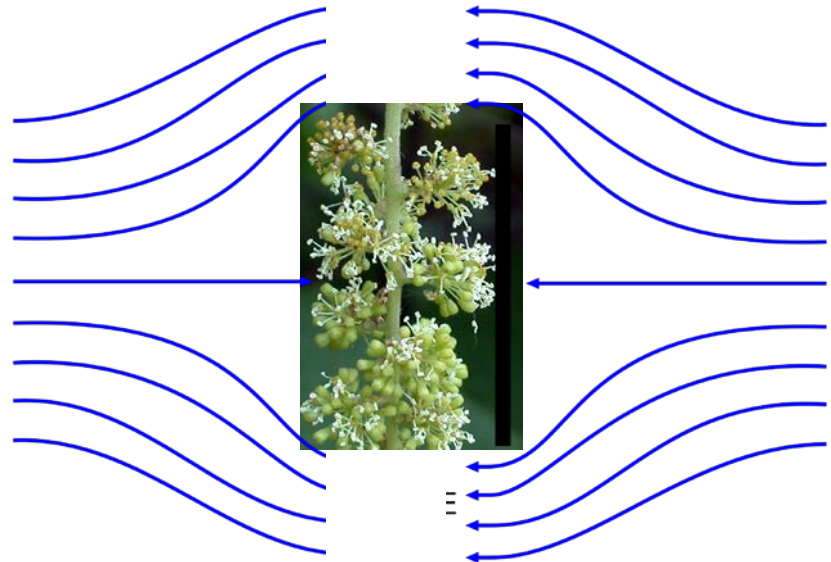
○ Laminar Flow



We imagine this ...



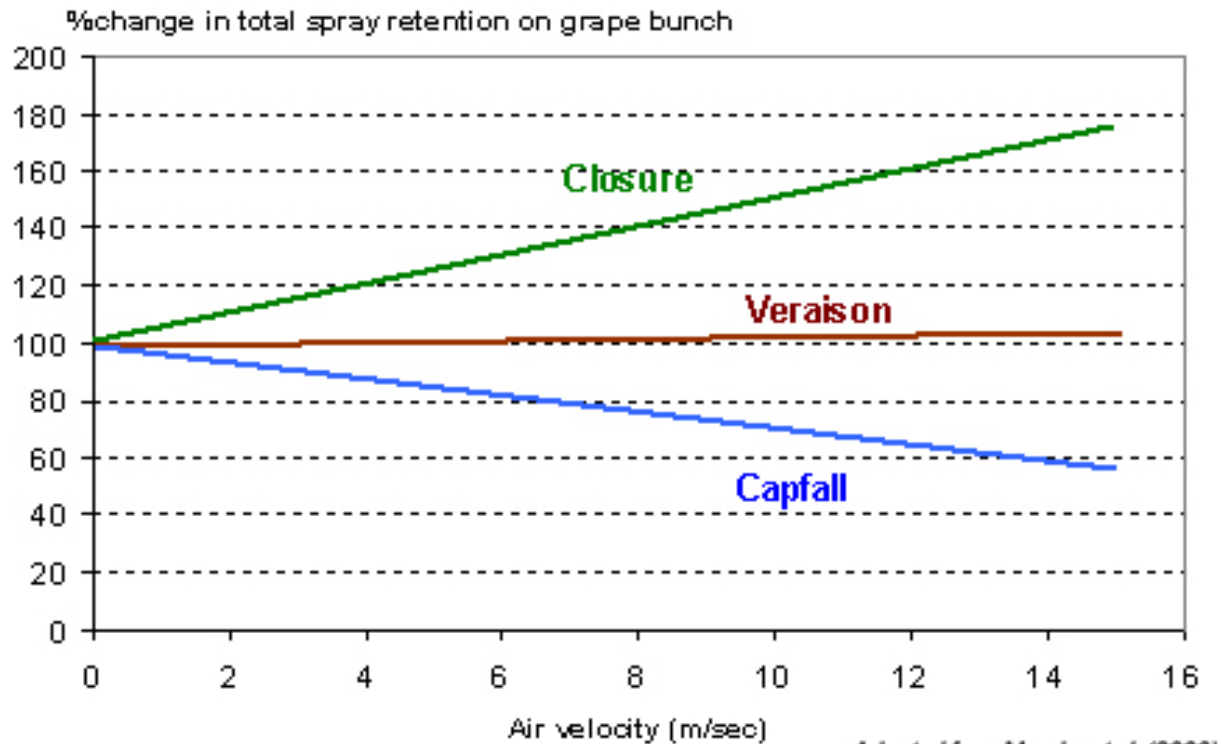
Actually this happens



Reduce the air-speed at flowering



Effect of air velocity on spray retention in grape bunches



Reduce the air speed at flowering



Changing the blade pitch on an axial fan sprayer to adjust air volume



Source: Research to Practice (CRCV)

Air blast sprayer outlet



Source: Research to Practice (CRCV)

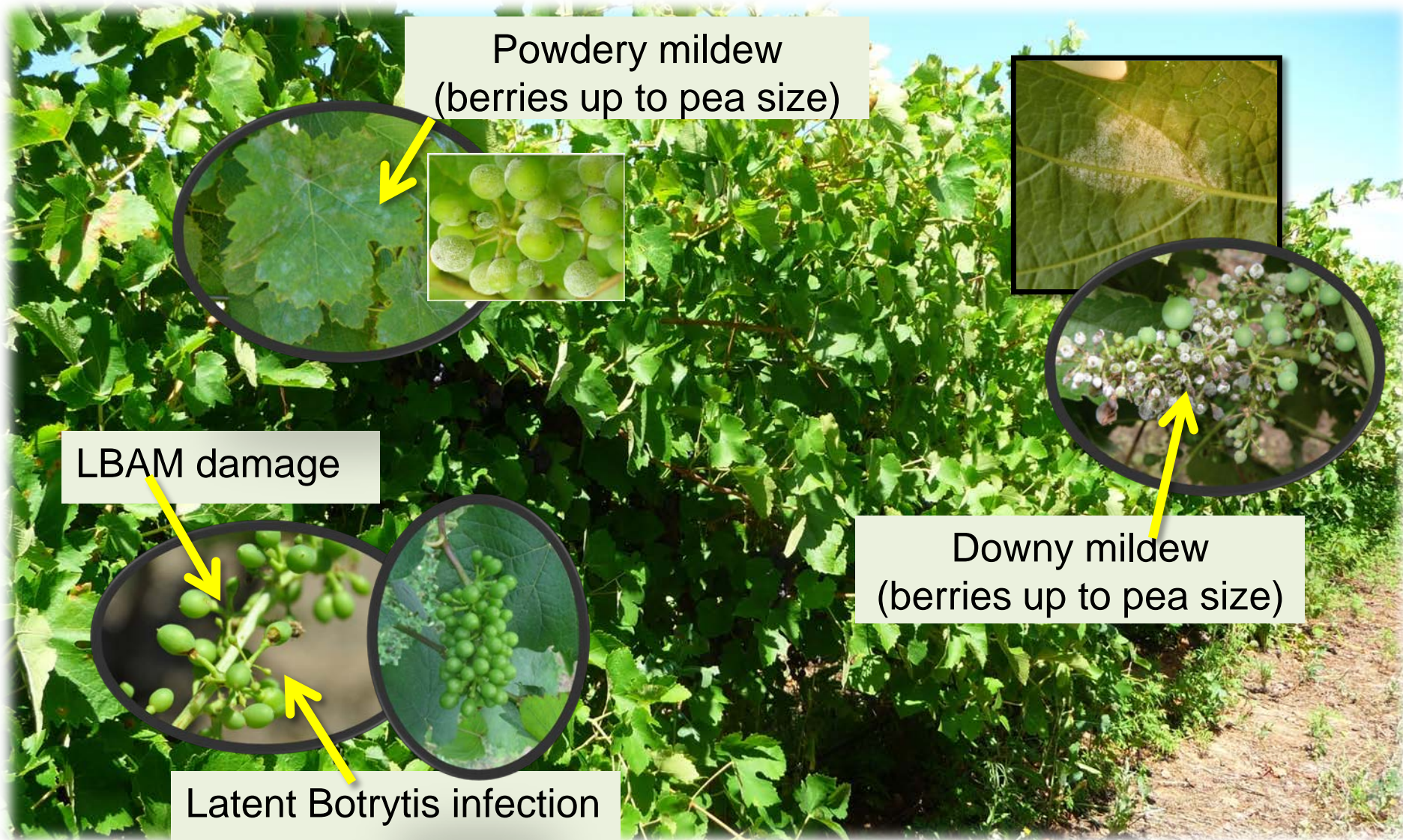


Source: Research to Practice (CRCV)

4. Pre-bunch closure



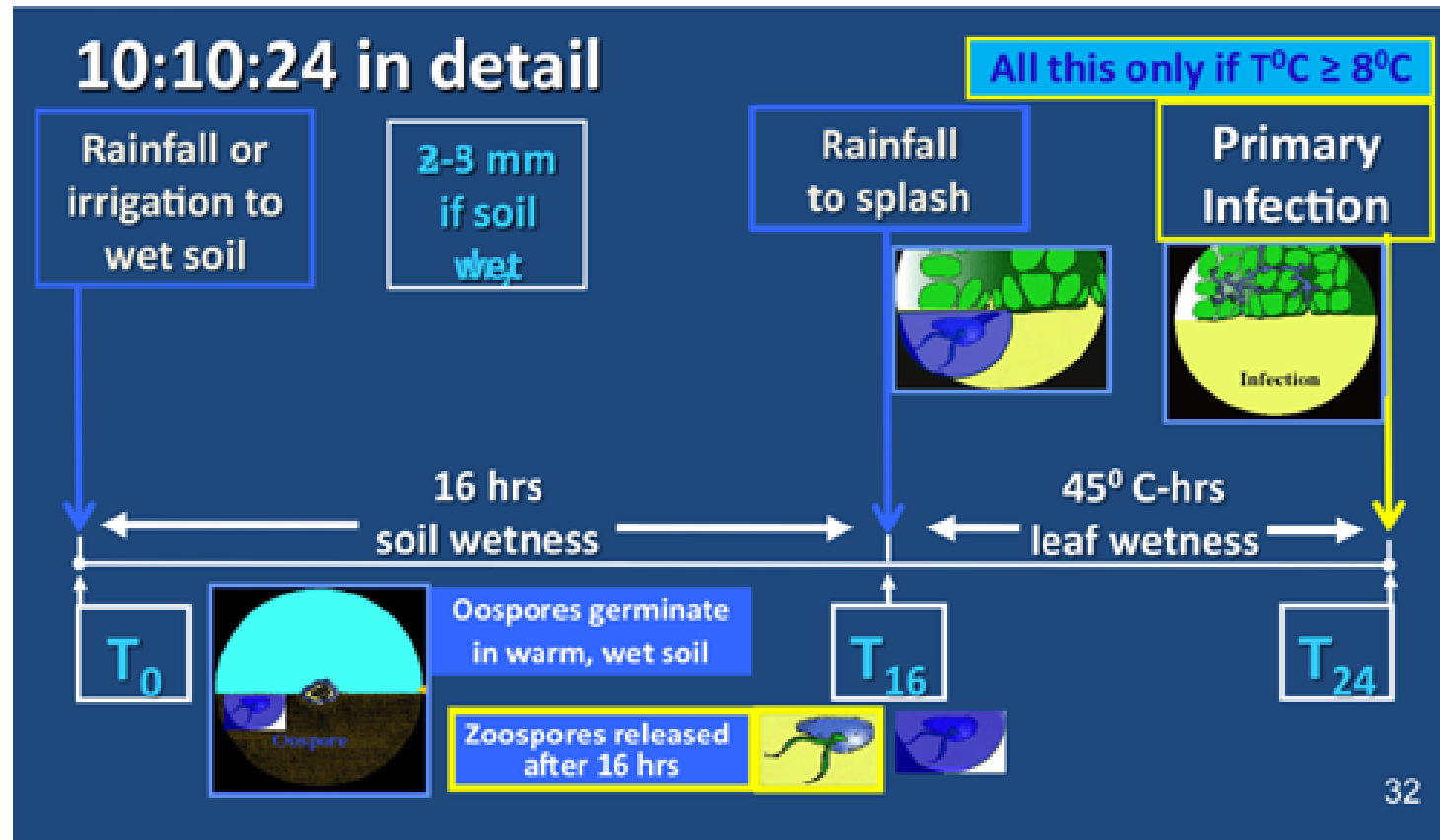
4. Pre-bunch closure – protect against ...



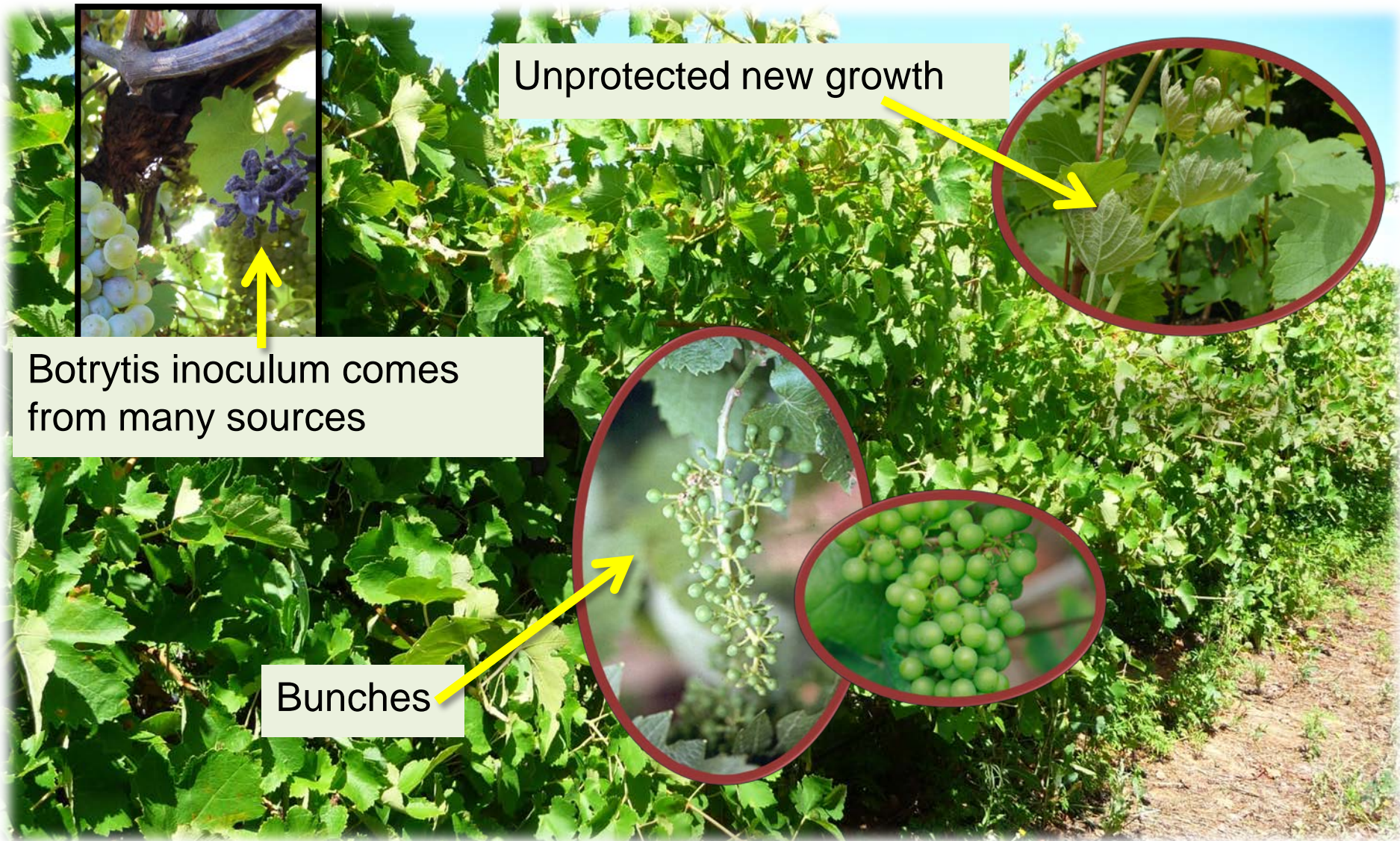
Critical spray times



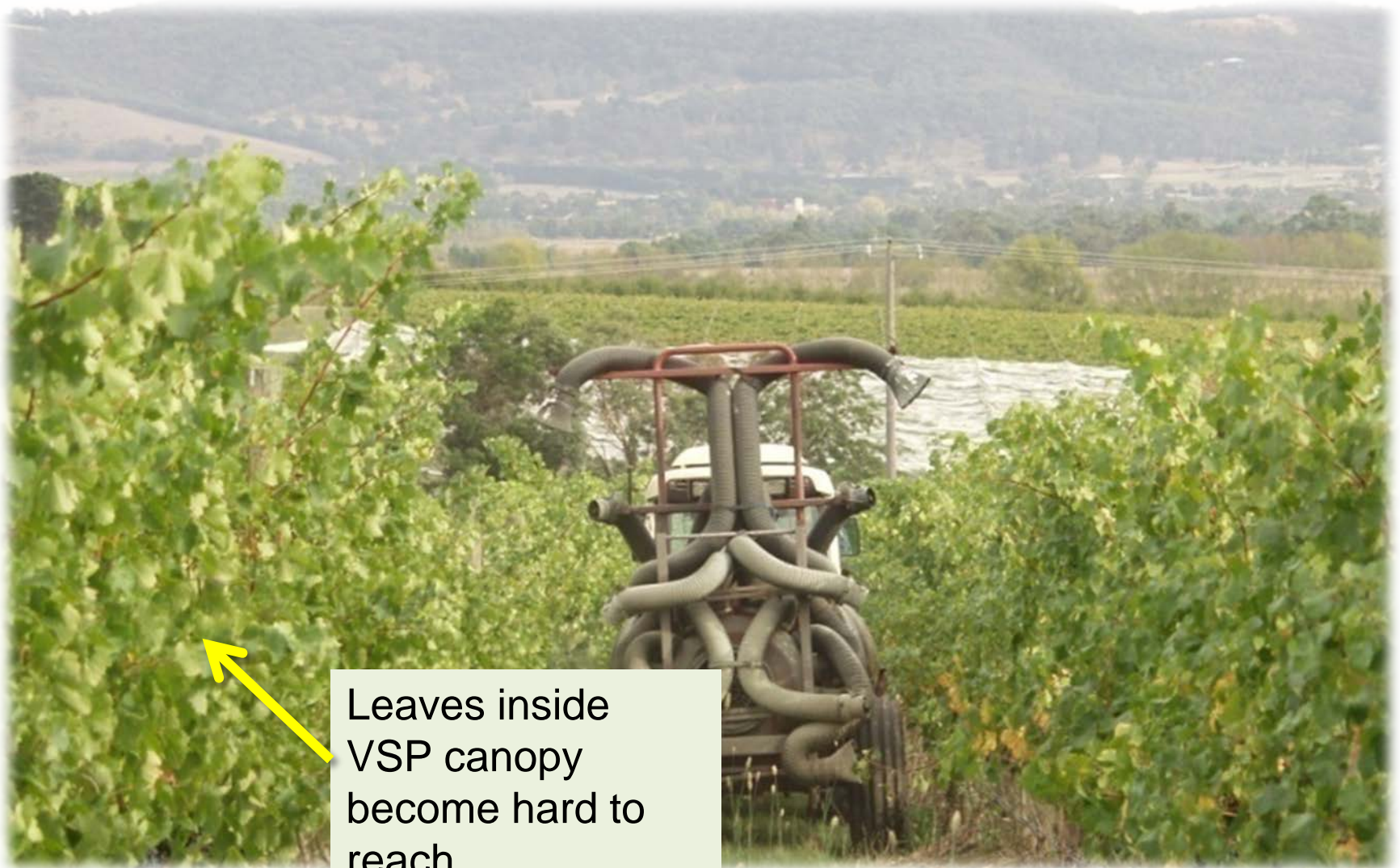
- Downy mildew primary infection



4. Pre-bunch closure – targeting the canopy



4. Pre-bunch closure – targeting the canopy

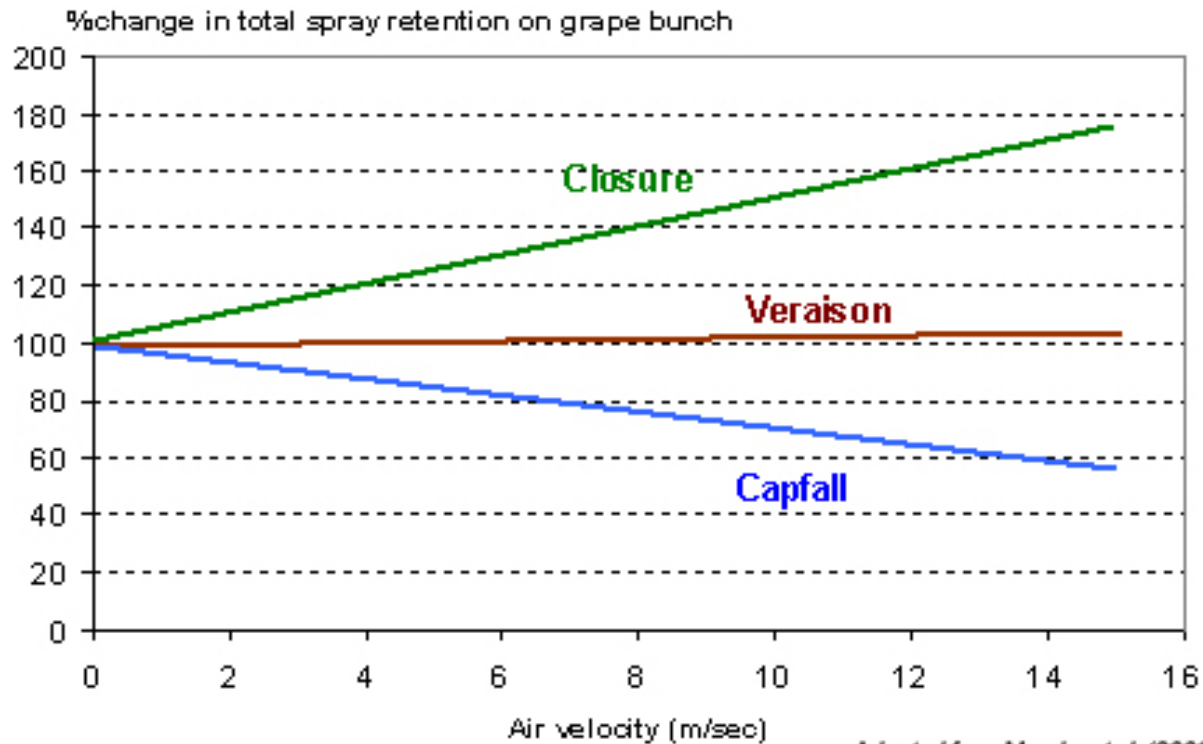


Leaves inside
VSP canopy
become hard to
reach

Increase air velocity at bunch closure



Effect of air velocity on spray retention in grape bunches

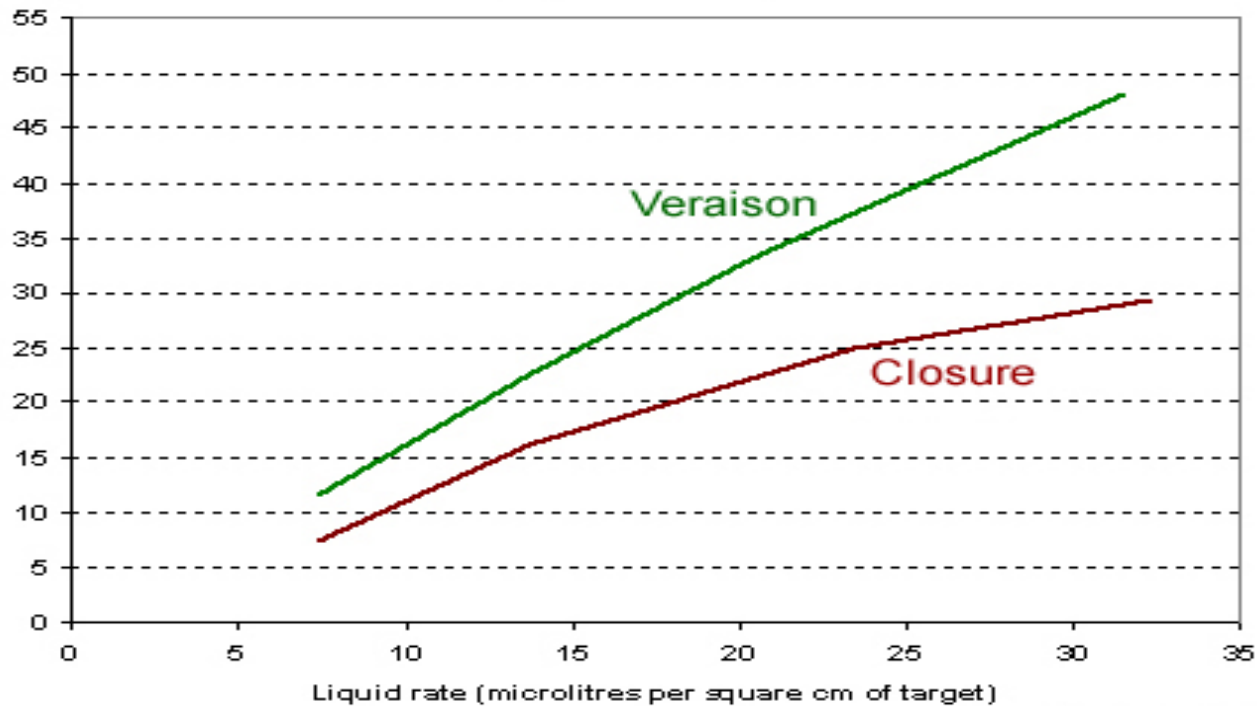


Increase spray volume after bunch closure



Effect of liquid volume on spray retention in grape bunches

Spray volume retained (microlitres per gram of tissue)



Source: Murphy et al. (2000)



5. Veraison to harvest



5. Veraison to harvest – protect against ...

Botrytis on a rain damaged berry.



Many sources of Botrytis inoculum.



Late season downy mildew can defoliate vines



Powdery mildew chasmothecia on leaves or shoots increase disease pressure next season.



5. Veraison to harvest – targeting the canopy

Lignifying canes resist being moved by air from the sprayer



Increase air and water volumes to spray maturing bunches

