

Compliance with regulatory requirements:

new products, new labels, weather and drift risk

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Newly registered agrochemicals in grapes

New for Powdery Mildew

- Cyflufenamid
 - Flute ®
 - Up to EL31 – berries pea size
- Proquinazid
 - Talendo ®
 - Up to 30 days before harvest



Agrochemicals
registered for use in
Australian viticulture

AN ESSENTIAL REFERENCE WHEN
GROWING GRAPES FOR EXPORT WINE

16/17



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New for Botrytis

- Fenpyrazamine
 - Prolectus ®
 - Up to 80% cap fall



The Australian Wine
Research Institute

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New for Downy Mildew

- Amisulbrom + tribasic copper sulfate
 - Amicus blue ®
 - Up to pea-size berries

- Ametoctradin + dimethomorph
 - Zampro ®
 - Up to 80% capfall



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LITHO IN AUSTRALIA

New for Eutypa Dieback

- For Eutypa control:
 - Cyproconazole + iodocarb
 - Garrison Rapid ®
 - Fluazinam
 - Emblem ®
 - Tebuconazole
 - Gel Seal ®, Greenseal ®
- Post-pruning / dormancy sprays



Agrochemicals
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Agrochemicals no longer available

- Fenarimol
 - no longer available for Powdery Mildew
- Fenamiphos
 - no longer available for nematodes
- Fenthion
 - insecticide no longer available
- Parathion methyl
 - insecticide no longer available



Fungicide Resistance

Resistance in Powdery Mildew

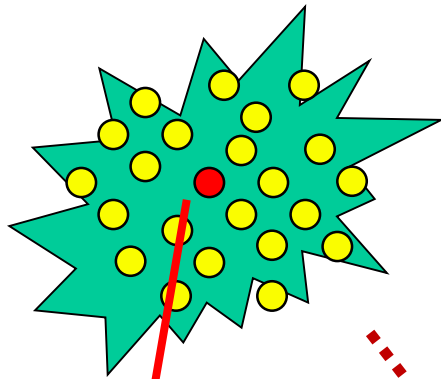
Assessment of Australian vineyards (2013-2016)

	Number of sites tested	Reduced sensitivity	Mutant present (%)
Cabrio [®] pyraclostrobin ^{1,2}	94	53%	86%
Topas [®] penconazole ¹	38	0	68%
Mycloss [®] myclobutanil ¹	66	14%	84%
Domark [®] tetraconazole ¹	21	0	82%

¹ EC₅₀ >1.0 µg/mL ² Discriminatory dose , >20% growth at 1.0 µg/mL

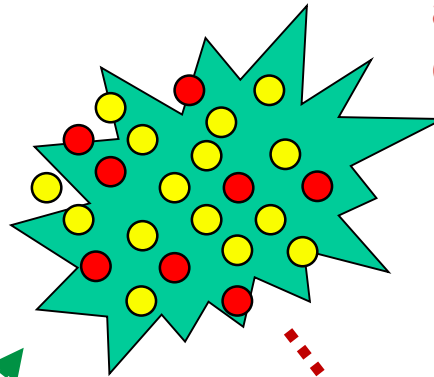
Resistant fungal cells need to **survive** then **reproduce**

Initial Population



Naturally occurring mutant - 'resistant' cell

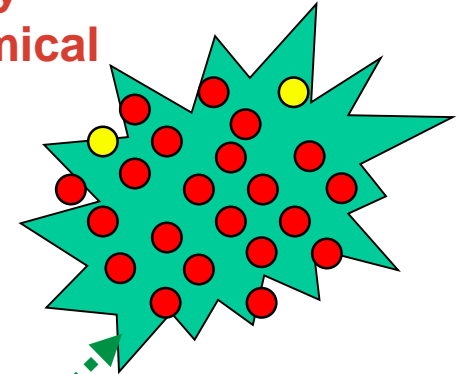
apply chemical



Fungal cells survive the fungicide application

Resistant Population

apply chemical



reproduction

Resistance Management

Rotate or mix different modes of action

Use label rates

Limit total number of applications per fungicide group

Understand fungicide activity, modes of action & resistance groups

Start a fungicide program with a multi-site MOA to reduce populations – **DO NOT** use single site MOA to control well-established infections

TIMING is critical



Agrochemicals registered for use in Australian viticulture

- The AWRI 'Dog Book' keeps you up to date
- Know which products have:
 - recently been registered
 - changed use (eg: use on another disease)
 - been reregistered for use in viticulture



Compliance

Keeping records

- Details that you are used to recording:
 - 1. date with start and finish times of application;
 - 2. location address and paddock/s sprayed;
 - 3. full name of this product;
 - 4. amount of product used per hectare and number of hectares applied to;
 - 5. crop/situation and weed/pest;
 - 6. name and address of person applying this product.

Recent labels include new details

- **Additional records are mandatory for some agrochemicals**
 - Relate to:
 - Weather
 - Equipment

- **Directions for Use** panel on the label includes **Restrictions**
 - May relate to:
 - Nozzles
 - Equipment set up
 - Weather
 - Maximum applications (to manage resistance)
 - Buffer zones
 - Spraying near waterways

Recently registered products (& new label wording)

- Talendo ®
- Flute ®
- Vivando ®
- Cyflamid ®
- Transform ®
- Delegate ®
- Success ®
- Zampro ®
- Revus ®
- Altacor ®

Read the Label !

Spray records – additional details may be required

- Details that must be recorded:
 - 1. date with start and finish times of application;
 - 2. location address and paddock/s sprayed;
 - 3. full name of this product;
 - 4. amount of product used per hectare and number of hectares applied to;
 - 5. crop/situation and weed/pest;
 - 6. wind speed and direction during application;
 - 7. air temperature and humidity;
 - 8. nozzle brand, type, spray angle, nozzle capacity and spray system pressure measured during application;
 - 9. name and address of person applying this product.

Labels – restraints on weather conditions



- DO NOT apply when wind speed is less than 3 or more than 20 km/h at the application site.

- DO NOT apply during surface temperature inversion conditions at the application site.



Spraying conditions – suitable

- Wind between 3 and 20 km/hr



Spraying conditions - **unsuitable**



- Wind between 3 and 20 km/hr ???

Piangil, VIC 3597

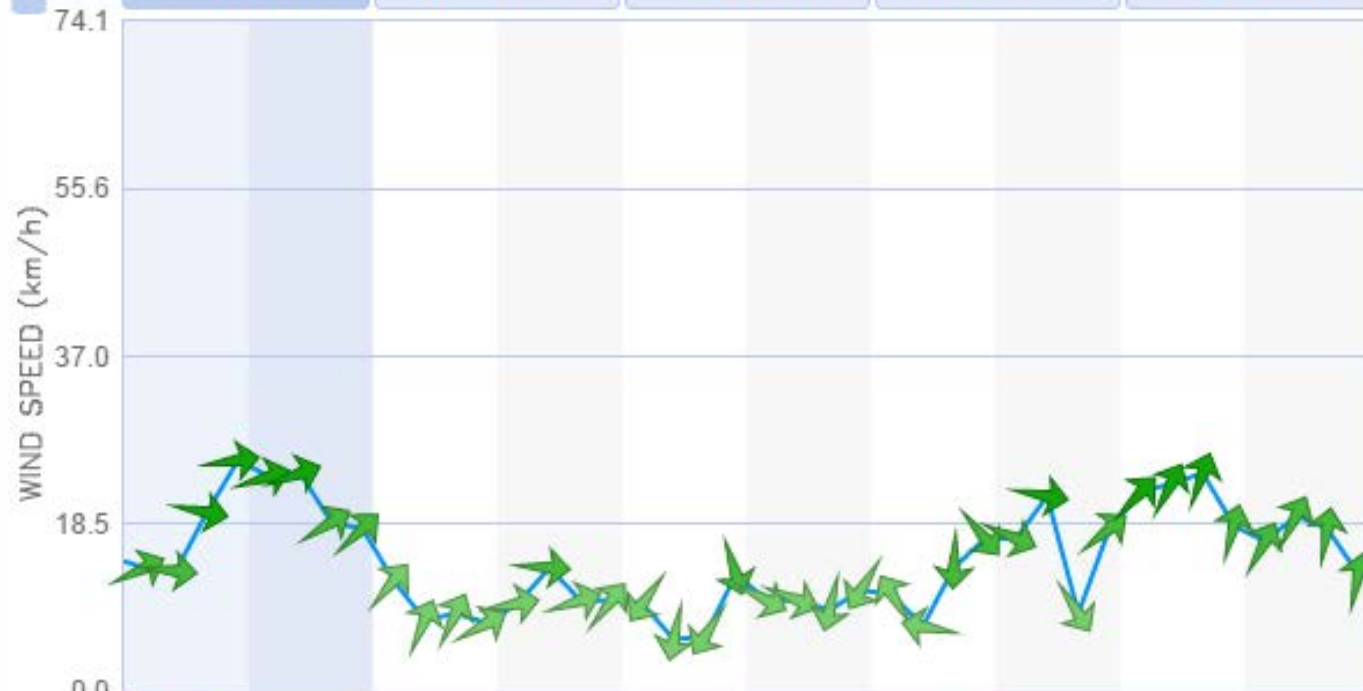
Australia » VIC » Mallee

Weather Rainfall **Wind** Sunrise / Sunset Moon Phases UV

PIANGIL WIND SPEED AND WIND DIRECTION FORECAST: [help](#)

Speed **km/h**

◀ **Tue** Oct 28 **Wed** Oct 29 **Thu** Oct 30 **Fri** Oct 31 **Sat** Nov 1 ▶



Wind Speed and Direction
Swell Height



Piangil wind forecast issued today at: 11:25am / Next forecast today around: 11:25pm
Wind forecast times have been adjusted for daylight saving where and when applicable

Labels – restraints on weather conditions

CAUTION
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS BEFORE OPENING OR USING

Flute 50 EW
FUNGICIDE

ACTIVE CONSTITUENT: 50 g/L CYFLUF

GROUP **U6** FUNGICIDE

BASF
For chemical labels

A fungicide for the control of powdery mildew in
the Directions for Use Table.

IMPORTANT: Read the attached booklet be

In a transport emergency dial 000, Police or Fire
For specialist advice in an emergency only, call

AgNova Technologies Pty Ltd
ABN 70 097 205 158
Suite 3, 935 Station Street
Box Hill North, Vic. 3129
Australia
Phone (03) 9899 8100
agnova.com.au

READ SAFETY DIRECTIONS BEFORE OPENING OR USING

ZAMPRO® FUNGICIDE

ACTIVE CONSTITUENT: 300 g/L AMETOCTRADIM
225 g/L DIMETHOMORPH

GROUP **45 40** FUNGICIDE

BASF
For chemical labels

For the control of

Important: Read the

CONTENTS

BASF Australia
Level 12, 28 Freshwater Place
Customer Serv

© Registered

APVMA App

CAUTION
KEEP OUT OF REACH OF CHILDREN
READ SAFETY DIRECTIONS BEFORE OPENING OR USING

VIVANDO® FUNGICIDE

ACTIVE CONSTITUENT: 500 g/L METRAFENONE

GROUP **U8** FUNGICIDE

For the control of powdery mildew in cucurbits and grapes as per the Directions for Use Table.

CONTENTS: 1 – 20 L

BASF Australia Ltd ABN 62 008 437 567
Level 12, 28 Freshwater Place Southbank VICTORIA 3008
© Registered trademark of BASF

APVMA Approval No: 63487/05939



- DO NOT apply when wind speed is less than 3 or more than 20 km/h at the application site **as measured 15 metres outside of the vineyard on the upwind side.**

- DO NOT apply during surface temperature inversion conditions at the application site.

Labels – restraints on weather conditions

- DO NOT apply when wind speed is less than 3 or more than 20 km/h at the application site as measured 15 metres outside of the vineyard on the upwind side.

- DO NOT apply during surface temperature inversion conditions at the application site.



Spraying conditions – **unsuitable**

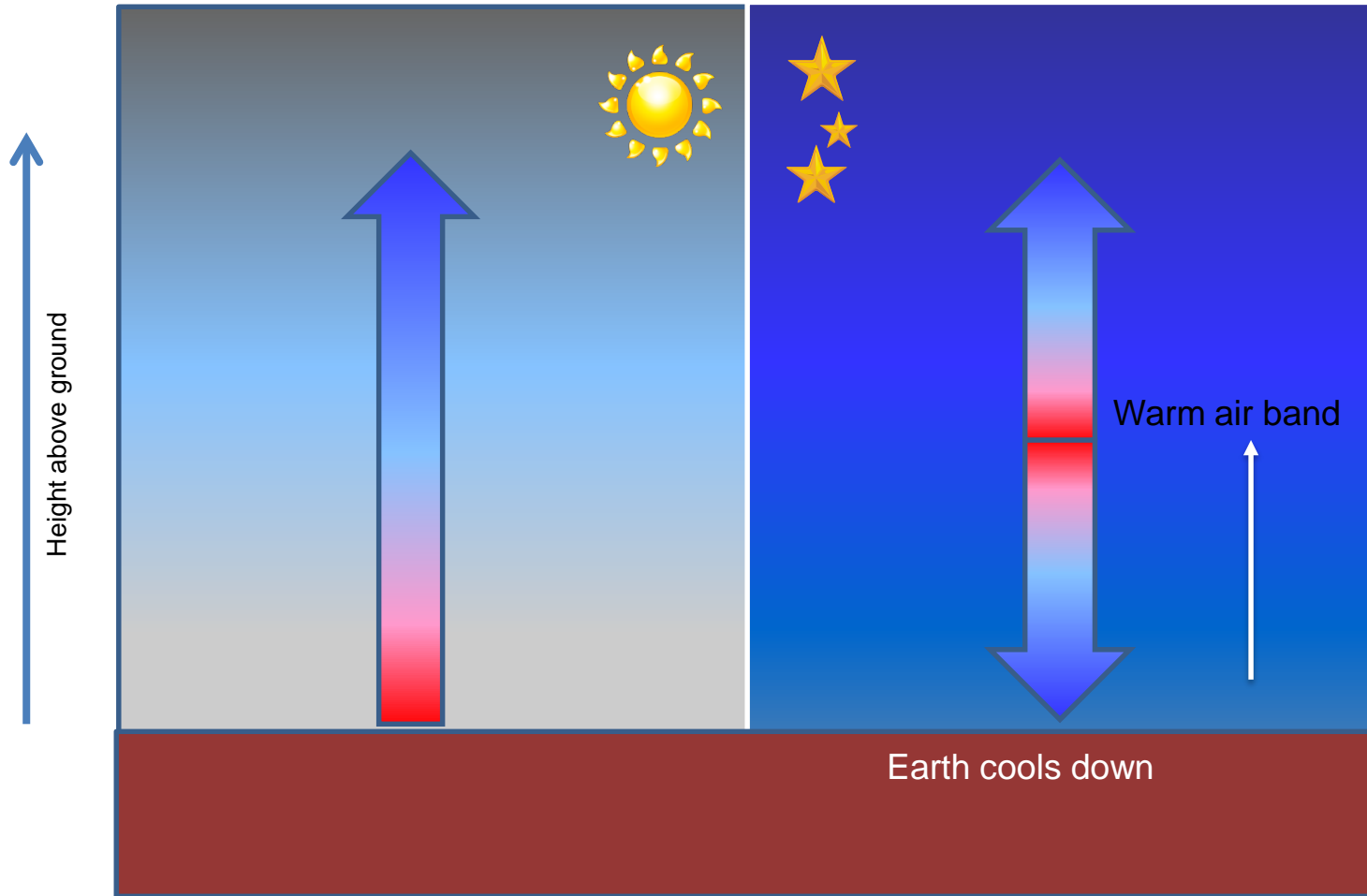


Photo credit: J.D. Griggs

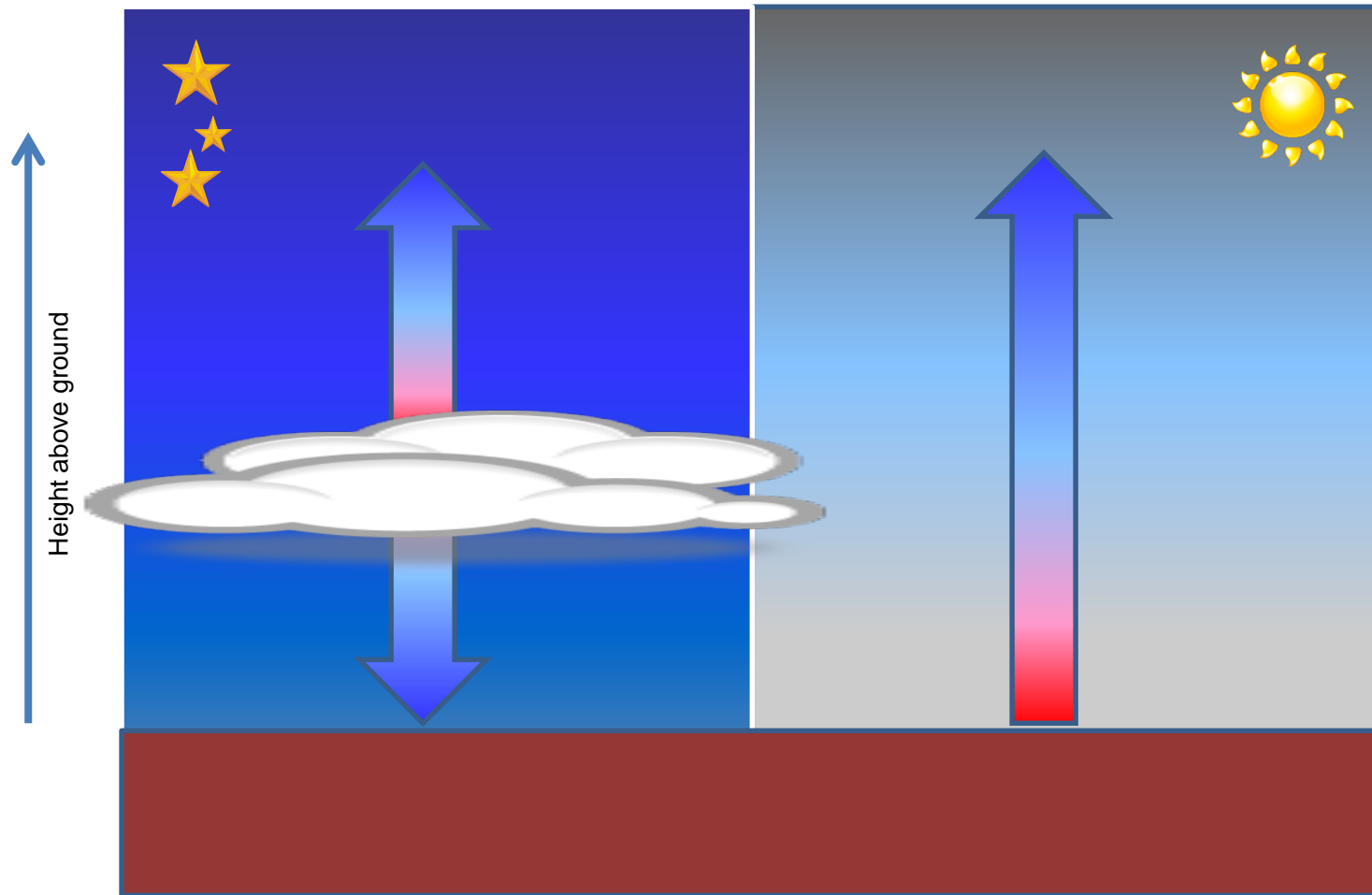


Photo credit: DPI Victoria

Typical profile of temperatures night and day



Typical profile of temperatures night and day



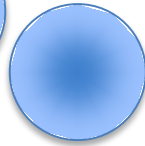
Spray records – additional details are required

- Details that must be recorded:
 - 1. date with start and finish times of application;
 - 2. location address and paddock/s sprayed;
 - 3. full name of this product;
 - 4. amount of product used per hectare and number of hectares applied to;
 - 5. crop/situation and weed/pest;
 - 6. wind speed and direction during application;
 - 7. air temperature and humidity;
 - 8. nozzle brand, type, spray angle, nozzle capacity and spray system pressure measured during application;
 - 9. name and address of person applying this product.

Droplet evaporation in **HUMID** conditions



200 μm



200 μm



- High relative humidity
- Low temperature
 - Some or no evaporation of droplets

Fall distance

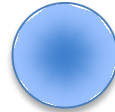
Wind



Droplet evaporation in **DRY** conditions



200 μm



100 μm

Wind



Fall distance

- **Low** relative humidity
- **High** temperature
 - Significant evaporation of droplets!

- Halving the diameter by evaporation concentrates the droplet $\times 8$

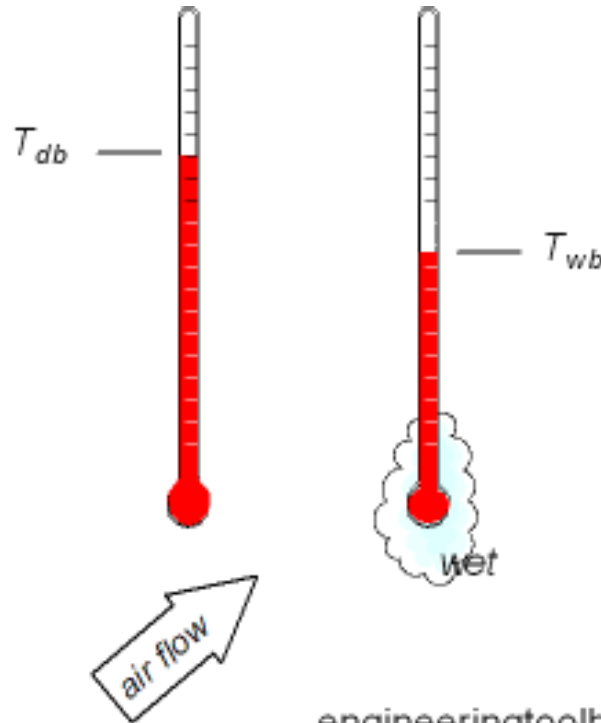


Delta T:

interaction between temperature and humidity

Dry Bulb Temperature (T_{db})

- Ambient air temperature, measured by a thermometer
- T_{db} is not affected by moisture, only by heat in the air

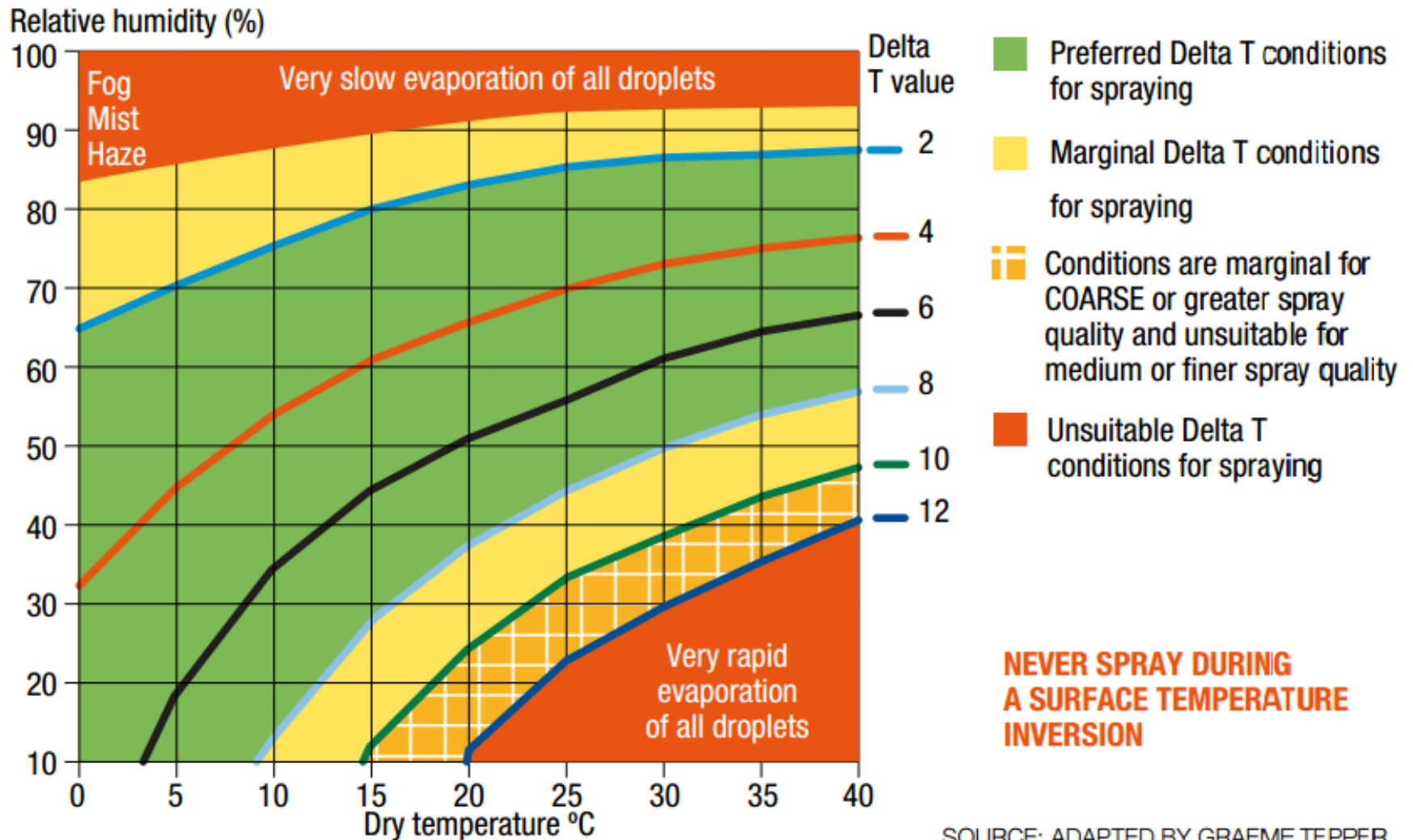


Wet Bulb Temperature (T_{wb})

- Indicated by a moistened thermometer bulb exposed to air flow
- Evaporation of water has a cooling effect, so T_{wb} is lower than the T_{db} of the air

Delta T (ΔT) is the difference between dry and wet bulb temperatures ($\Delta T = T_{db} - T_{wb}$)

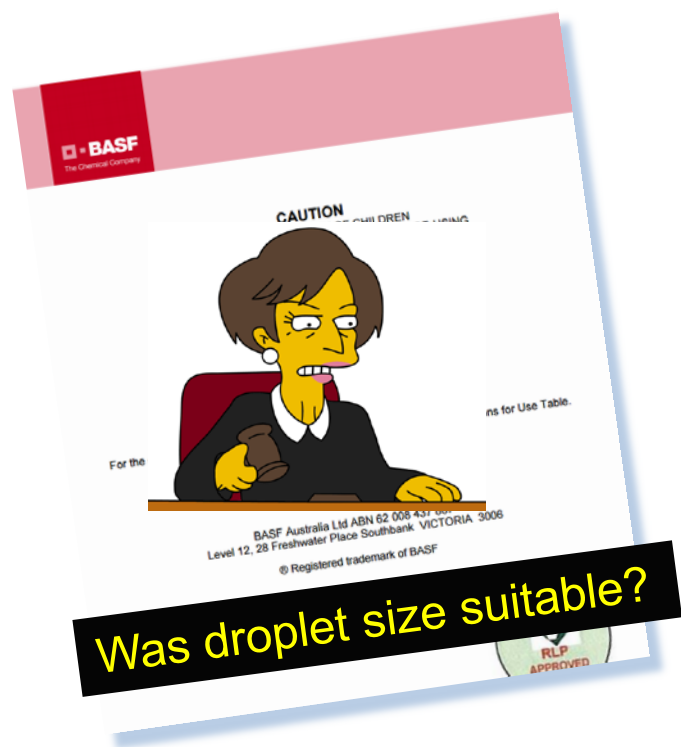
Delta T



For the estimation of evaporation potential of the aqueous component of pesticide droplets the rate can be considered to be constant for a given Delta T.

SOURCE: ADAPTED BY GRAEME TEPPER (2012) ORIGINALLY SOURCED FROM NUFARM'S SPRAYWISE DECISIONS CHART (2012)

New labels – restraints on nozzles



DO NOT apply with spray droplets smaller than a **MEDIUM** spray droplet size category according to nozzle manufacturer specifications that refer to the ASAE S572 Standard or the BCPC Guideline.

New labels – restraints on nozzles



- Except when applying with vineyard airblast equipment,

DO NOT apply with spray droplets smaller than a **MEDIUM** spray droplet size category according to nozzle manufacturer specifications that refer to the ASAE S572 Standard or the BCPC Guideline.

Pressure affects droplet spectrum from nozzles

HCA / ATR 80° - Hollow Cone

	40 PSI	50 PSI	60 PSI	70 PSI	80 PSI	90 PSI	100 PSI	125 PSI	150 PSI	350 PSI
ATR-White	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF
HCA-01	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF
ATR-Lilac	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF
HCA-015	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF
ATR-Brown	VF	VF	VF	VF	VF	VF	VF	VF	VF	VF
HCA-02	F	F	VF	VF	VF	VF	VF	VF	VF	VF
ATR-Yellow	F	F	VF	VF	VF	VF	VF	VF	VF	VF
HCA-025	F	F	F	VF	VF	VF	VF	VF	VF	VF
ATR-Orange	F	F	F	F	VF	VF	VF	VF	VF	VF
HCA-03	F	F	F	F	F	VF	VF	VF	VF	VF
ATR-Red	F	F	F	F	F	F	VF	VF	VF	VF
HCA-045	M	F	F	F	F	F	F	VF	VF	VF
ATR-Green	M	M	F	F	F	F	F	F	VF	VF
ATR-Blue	M	M	M	M	F	F	F	F	F	F



Labels – restraints on equipment

DO NOT direct the spray above vines during airblast applications.

- TURN OFF outward pointing nozzles at row ends and outer rows during airblast applications.



Equipment adjustment

Tested three machines with eight setups (varying nozzles and air)

BEFORE

~18% airborne



AFTER

~2% airborne



~34% on ground

~5% on ground

Spray records – new detail is required



- Users of this product **MUST**
 - make an accurate written record of the details of each spray application
 - within 24 hours following application
 - Keep this record for a minimum of 2 years

Spray records – new detail is required

- Details that must be recorded:

- 1. date with start and finish times of application;
- 2. location address and paddock/s sprayed;
- 3. full name of this product;
- 4. amount of product used per hectare and number of hectares applied to;
- 5. crop/situation and weed/pest;

- 6. wind speed and direction during application;

- 7. air temperature **Was Delta T suitable?**

- 8. nozzle brand, type, spray angle, nozzle size, spray system pressure measured during application, **Was droplet size suitable?**



- 9. name and address of person applying this product.

Decision support is available



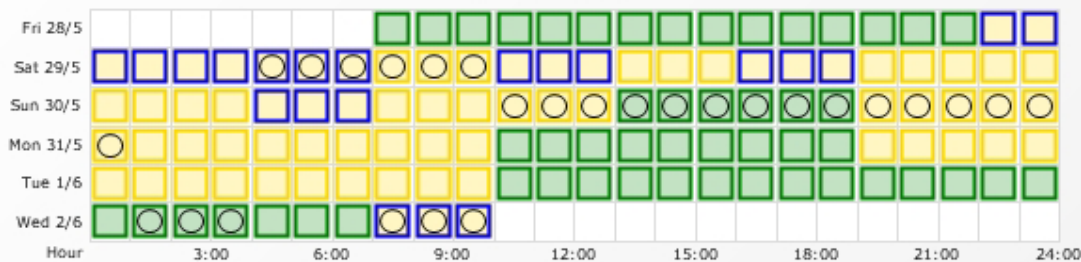
Spray Planner

Location : 3502 [-37.973,145.258]

Date : 28/05/2010 7:00 AM (UTC +10)

Predictive data was generated using computer models. This is a guide only. It does not replace real-time observations. Good application conditions may not equate to good growing conditions. Avoid stresses ie. frosts, dry conditions etc. prior to and after pesticide application for optimum results.

Spray Planner



Note: Colour coding in Spray Planner is based on Delta T values.

Frost Risk



The traffic light system is based on Delta T

Green (Go) - Delta T between 2 and 8

Yellow (Caution) - Delta T of 0 - 2 or 8 - 10

Red (Stop) - Delta T of greater than 10

For an explanation of Delta T, go to the FAQ page.

Legend

- Green square: Go
- Yellow square: Caution
- Red square: Stop
- Blue square: Rain Risk
- X: Frost Risk
- O: Wind Risk
- +: Inversion Risk



Bureau of Meteorology and other web sources provide support to help growers assess weather conditions before spraying