PACKING THIS SEASON'S TABLE GRAPES

BY

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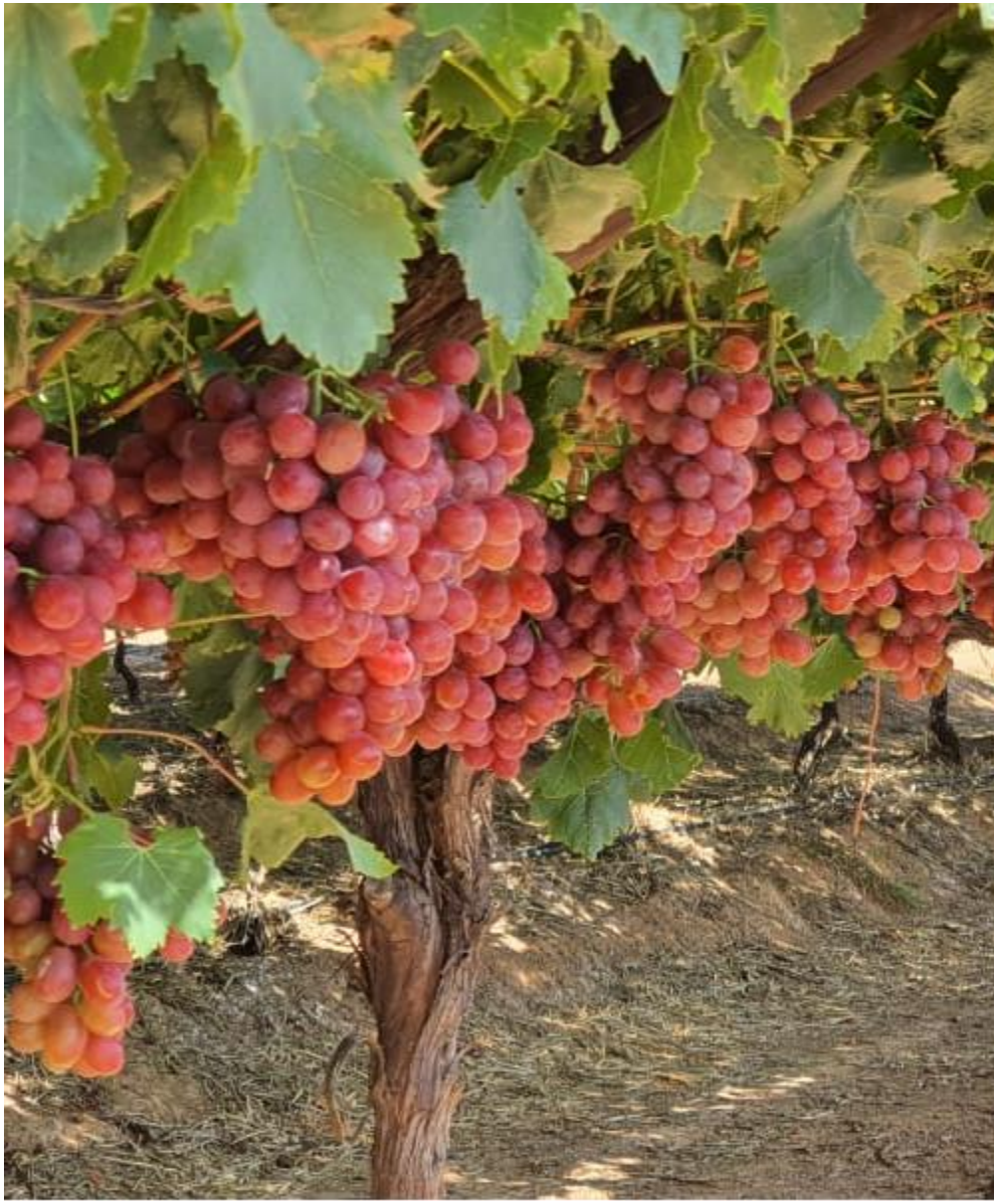


OVERVIEW OF TABLE GRAPE INDUSTRY: RSA

OVER LAST DECADE:

- TABLE GRAPE INDUSTRY WAS RELATIVELY SOUND
- HA PLANTED GREW BY 53%
- EQV CARTONS EXPORTED GREW BY 42%
- GOOD QUALITY
- PREFERRED SUPPLIER TO UK/EU
- PROFITABILITY WAS GOOD
- WEATHER WAS MOSTLY GOOD

HA PLANTED

	2011	2021	INDEX
NP	997	2575	**258**
OR	4501	5626	**125**
OIF	720	1168	**162**
BR	3288	4789	**146**
HR	3956	6406	**162**
TOTAL RSA	13462	20564	**153**

EQV CARTONS EXPORTED (In m's)

	2011/2	2021/2	INDEX
TOTAL RSA	54,7	77,7	**142**

HOWEVER, FROM 2020/1 THE SITUATION CHANGED!

WHAT HAS CHANGED?: TRADE ENVIRONMENT

1 **TRADE GIVEN PANDEMIC AND WAR**

COVID-19

WAR IN UKRAINE

2 **PRODUCTION COSTS**

INFLATION AND HIGHER INTEREST RATES

INPUT COSTS I.E. FUEL, ELECTRICITY, LABOUR, PACKAGING, ETC.

3 **LOGISTICAL ISSUES**

SHIPPING TIMES & CONTAINER AVAILABILITY

STATE OF SA HARBOURS: DELAYS

DELAYS IN OVERSEAS' HARBOURS

4 **GLOBAL SUPPLY OF TABLE GRAPES AND DEMAND**

COMPETITION I.E. FROM PERU IN TRADITIONAL MARKETS (UK/EU)

CONSUMER PREFERENCES: NEW VARIETIES AND EATING QUALITY

5 **PROFITABILITY OF TABLE GRAPE SALES DROPPED**

DID WE ADAPT QUICKLY ENOUGH TO THE CHANGING TRADING ENVIRONMENT?

WHAT HAS CHANGED?: TWO WET SEASONS

PRIOR TO 2020/21 MOSTLY DRY SEASONS

2020/21 & 2021/2022 WET SEASONS

- INCREASED SUPPLY OF TABLE GRAPES FROM SA
- IN GENERAL POOR QUALITY TABLE GRAPES
- MANY CLAIMS
- LOWER PRICES, LOWER PROFITABILITY
- SA SLOWLY LOOSING ITS COMPETITIVE ADVANTAGE

DID WE ADAPT QUICKLY ENOUGH TO THE WET WEATHER?

WHAT CAN WE DO?

PROFIT = (PRICE X QUANTITY) MINUS COSTS OR Pr = (PXQ)-C

PRICE: WE ARE A PRICE TAKER (TABLE GRAPES A COMMODITY?)

COSTS: WORK THROUGH COST CHAIN AND SAVE, BUT NOT ON **QUALITY**!

QUANTITY: WE HAVE CONTROL. **QUALITY** OF FRUIT VERY IMPORTANT!

PAY ATTENTION TO:

YIELD VERSUS QUALITY

OPTIMUM HARVEST RIPENESS

DO NOT SAVE ON PRE-HARVEST SANITATION AND BOTRYTIS SPRAYS

CORRECT PACKAGING MATERIAL

PRODUCE HIGHEST QUALITY GRAPES AT COMPETITIVE/AFFORDABLE PRICES AND LOWEST COST

NEED PRACTICAL ADJUSTMENTS

"FRUIT MUST HAVE LEGS" (MOET BENE Hê)

NEXT - CONCENTRATE ON POST-HARVEST QUALITY OF TABLE GRAPES

CHINA: CASE STUDY

HARVEST THROUGHOUT THE DAY

PACK GRAPES UNDER CANOPY

IN CLOSED LINERS

WITH PAPER/MAMS

GRAPES STAY DRY

FORCED AIR COOLING RIGHT AFTER PACK

REMEMBER UNIFRUCO PROTOCOL! FORCED AIR COOLING WITHIN 6 HOURS AFTER HARVEST

STORE GRAPES FOR UP TO 24 WEEKS (6 MONTHS)

FROM SEPTEMBER TO JAN/FEB – CHINESE NEW YEAR

FACTORS INFLUENCING QUALITY OF GRAPES

BASED ON A PRESENTATION BY:

ALWYN VAN JAARSVELD

“MOISTURE & SO2 IN PACKED GRAPES”

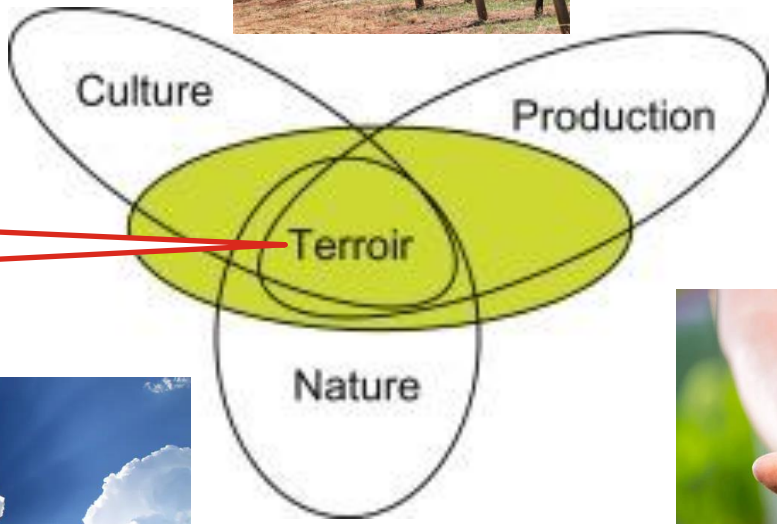
24 JUNE 2021

1. TERROIR

What is terroir?

- **Terroir** (/tɛˈrwɑːr/, French: [tɛʁwaʁ]; from terre, "land") is a French term used to describe the environmental factors that affect a crop's phenotype, including unique environment contexts, farming practices and a crop's specific growth habitat.

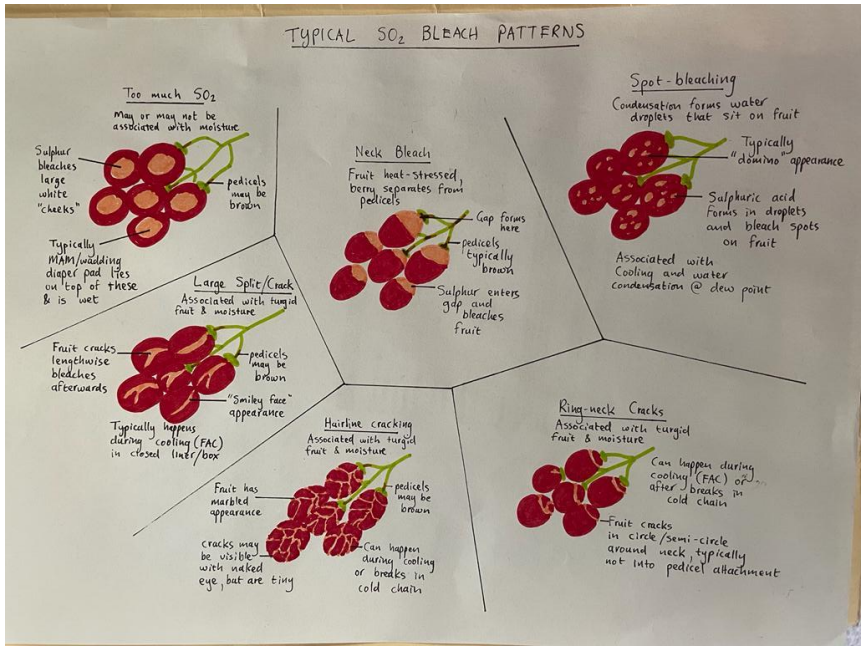
  Wikipedia



"Sweet Spot" for Quality

2. FROM PICKING GRAPES TO PRE-COOLER

- PICK AND TRANSPORT TO PRE-COOLER IN LIGHT COLOUR CRATES
- MEASURE RH
- MANAGE PRE-COOLER ON/OFF ACCORDING TO:
  - RH
  - AREA
  - TEMPERATURE
  - TIME OF DAY



2. Relative Humidity: Snapshot in March – Typical of Season

Cool season

High humidity!

Weather Station Area: De Doorns						
Date	**Day**	**Temp Min (˚C)**	**Temp Max (˚C)**	**RH Min (%)**	**RH Max (%)**	**RH Ave (%)**
2021/03/17	Wed	13.1	24.4	29	89	63
2021/03/18	Thu	14.4	25	32	90	63
2021/03/19	Fri	11.7	21.7	48	90	72
2021/03/20	Sat	11.1	19.4	51	95	78
2021/03/21	Sun	10.4	23.3	32	89	67
2021/03/22	Mon	11.7	34.7	32	94	67
2021/03/23	Tue	13.4	27.3	28	82	62
2021/03/24	Wed	14.9	28.9	28	84	59
2021/03/25	Thu	18.1	31.3	20	69	48

Lowest Temperature @ 5 am (below dew-point)

Highest Temperature @ 2-5 pm

3. RELATIVE HUMIDITY & BOTRYTIS

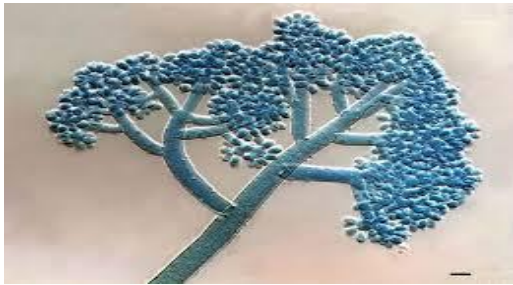
- The weather factors displaying the strongest influence on *Botrytis cinerea* mean daily conidia counts were temperature (especially dew-point) and humidity. Both parameters are considered critical for grey mould spore germination and the development of infection.

Year	Total Annual Spores (spores/m³)
2004	5022
2005	1700
2006	4881
2007	15331
2008	37299

Highest spore levels after fruit ripening

22X more *Botrytis* spores in wettest year than driest year!

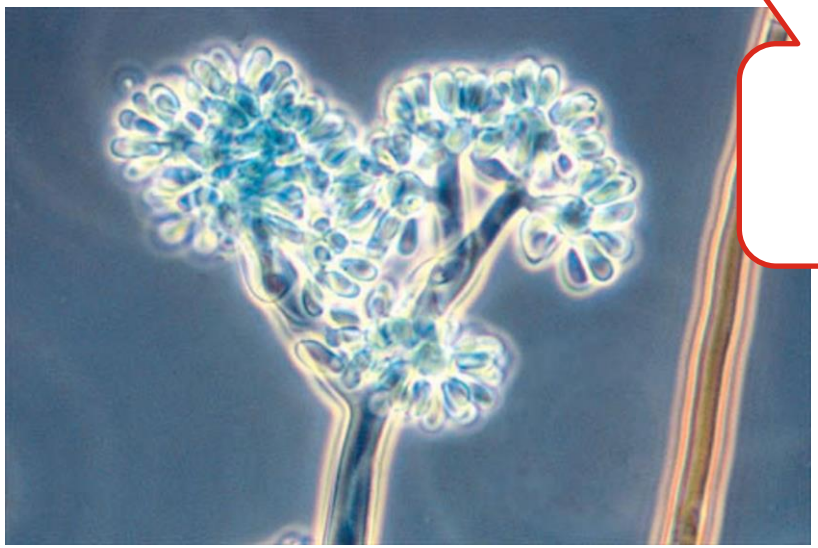
- F. Javier Rodríguez-Rajo , Victoria Jato , María Fernández-González & M. Jesus Aira (2010) The use of aerobiological methods for forecasting Botrytis spore concentrations in a vineyard, Grana, 49:1, 56-65, DOI: 10.1080/00173130903472393



4. MODERN VARIETIES

What the market prefers!

- Vigorous/High yielding
- Firm texture (crunchy/crispy)
- Thin skin
- Sweet
- Lack of astringency



Also what *Botrytis* prefers…

5. ARE WE FARMING THE SAME?

- Valley monoculture
- Nets
- Plastic
- Canopy management

6. WHAT IS BOTRYTIS GOOD AT?

- Can grow on any organic material
- Needs high humidity and prefers free moisture
- Is well adapted to growing at zero degrees Celsius
- But actually prefers higher temperature

6. WHAT DOES BOTRYTIS LIKE?

- ***Botrytis*** **likes damaged material (it needs an entry point) – is a wound pathogen**

Flower infection, can lead to internal/ endogenous/ inherent *Botrytis* infection

Hairline cracks/rain damage can lead to *Botrytis* infection including “slipskin” *Botrytis*

6. WHAT DOES BOTRYTIS LIKE?

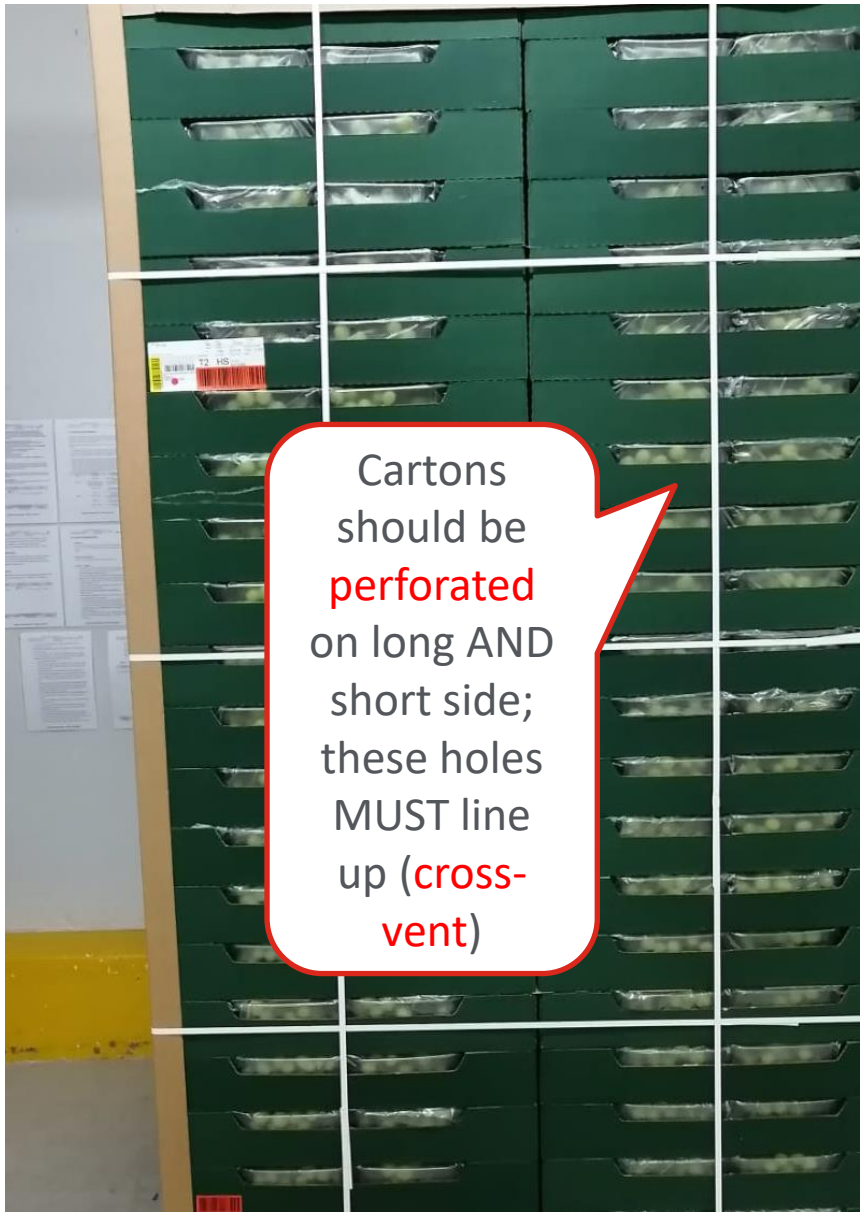
- **Botrytis has a sweet tooth…**

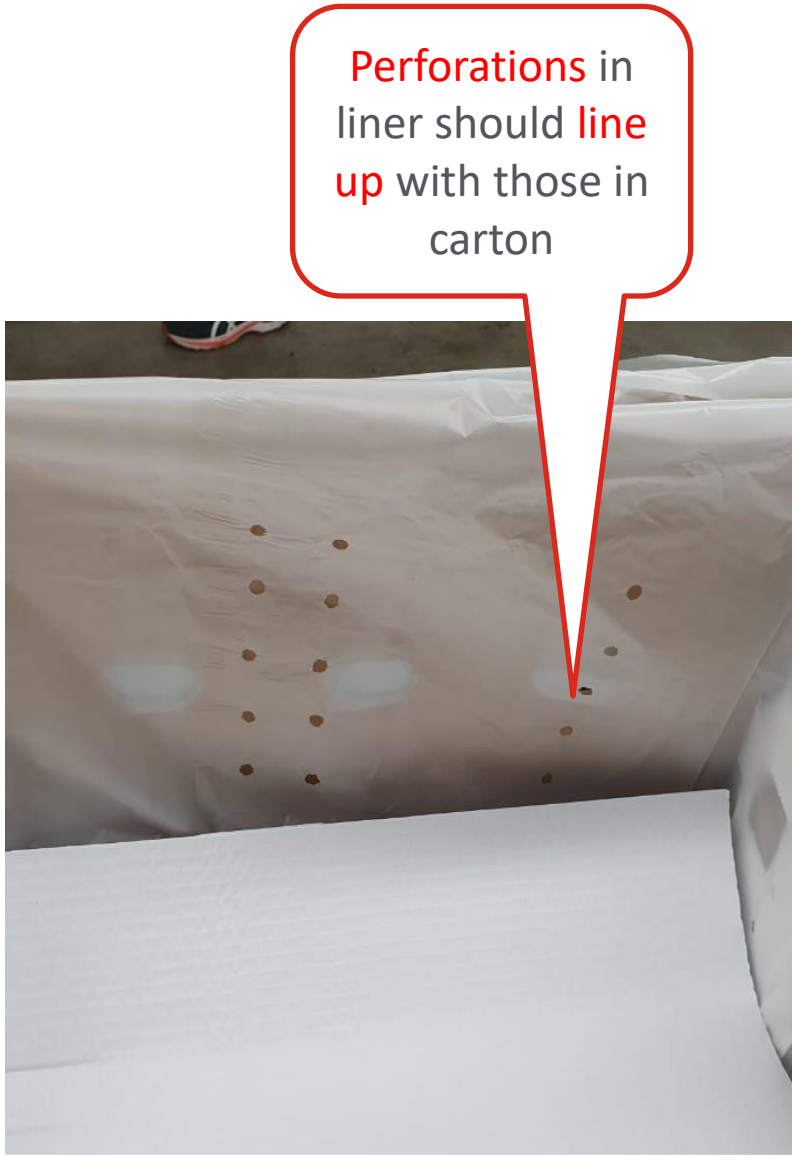
Botrytis growth on sweet grape material

7. PACKAGING: THE SKIN OF THE PALLET

- A pallet has a skin of carton and plastic
- Cartons MUST have ventilation on all sides
- Cartons should cross-vent (channels to remove heat)
- Liners should be ventilated for use with forced-air cooling
- BOTH need to work in tandem to be successful (perforations line up)

7. PACKAGING: THE SKIN OF THE PALLET

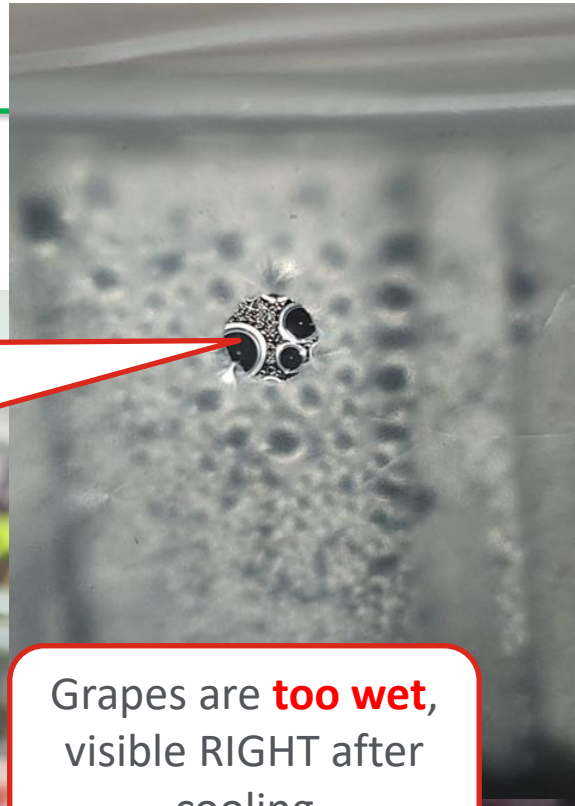




7. PACKAGING: WHEN WET

When it goes wrong! These grapes will travel for **weeks in water**…

Box height too low, **punnet sealed off** top & bottom <u>despite</u> perforated liner



Grapes are **too wet**, visible RIGHT after cooling

7. PACKAGING: TOO WET

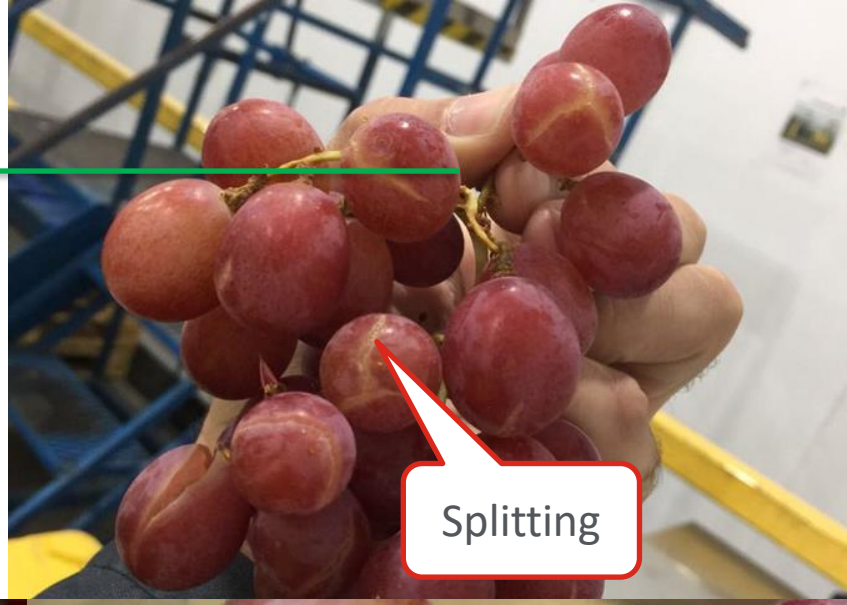
Wet grapes = 4 problems

Splits

Hairline cracks

Sulphur burn

Botrytis



7. INTERNAL PACKAGING

- What if you don't get the water out?
- Absorb with Paper/MAM options
- Ensure punnets are not shut in
- Bags should not block airflow or SO_2

8. CAN YOU COOL TOO FAST?

Stomata only on stems, not on berries

SO_2 also has a preservative function, keeping stems green

Stem condition when grapes had **no delay** in cooling

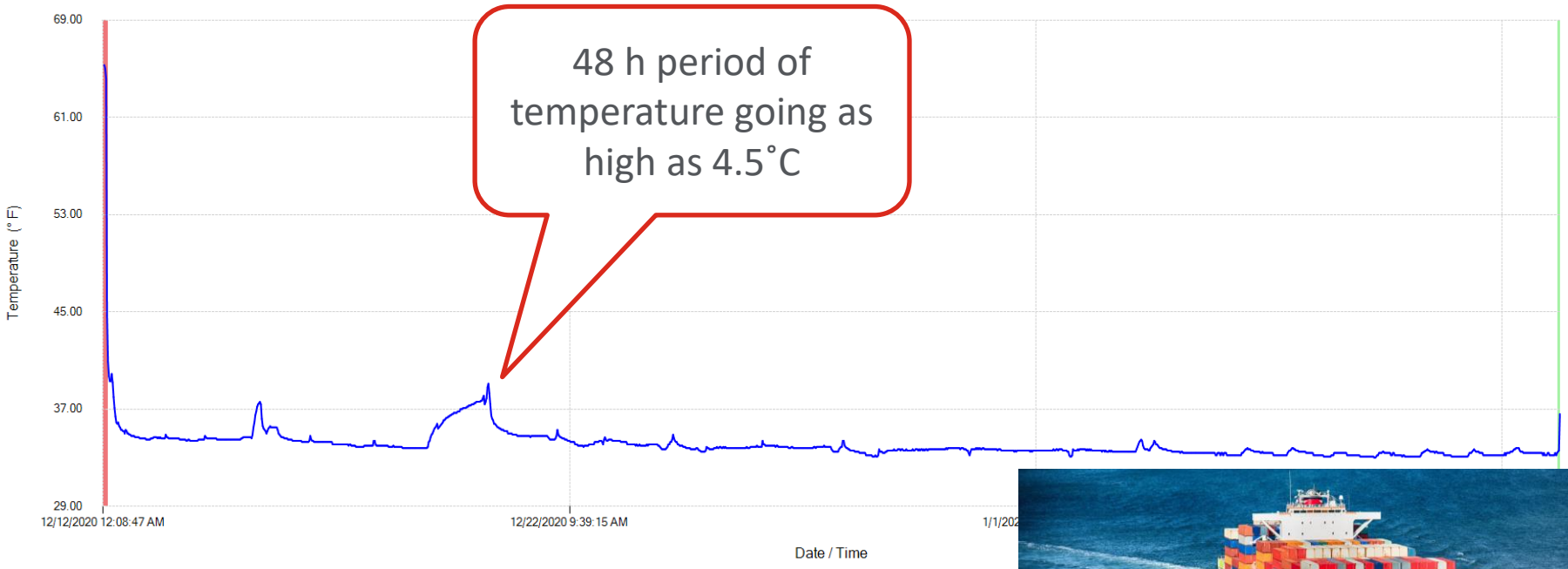
The SAME grape stem with cooling delayed 9 hours from picking

Flame Seedless table grape stem condition after 0, 3, 6 and 9 hours delayed cooling (79°F, 30% rh and 25 fpm air velocity) followed by 7 days cold storage (32°F, 95% rh and 10 fpm air velocity).

TESSARA
fresh science

9. BREAKS IN COLD CHAIN

- Use a logger!
- Check your logger data
- Breaks in cold chain form more condensation



10. COVID RELATED LOGISTICS

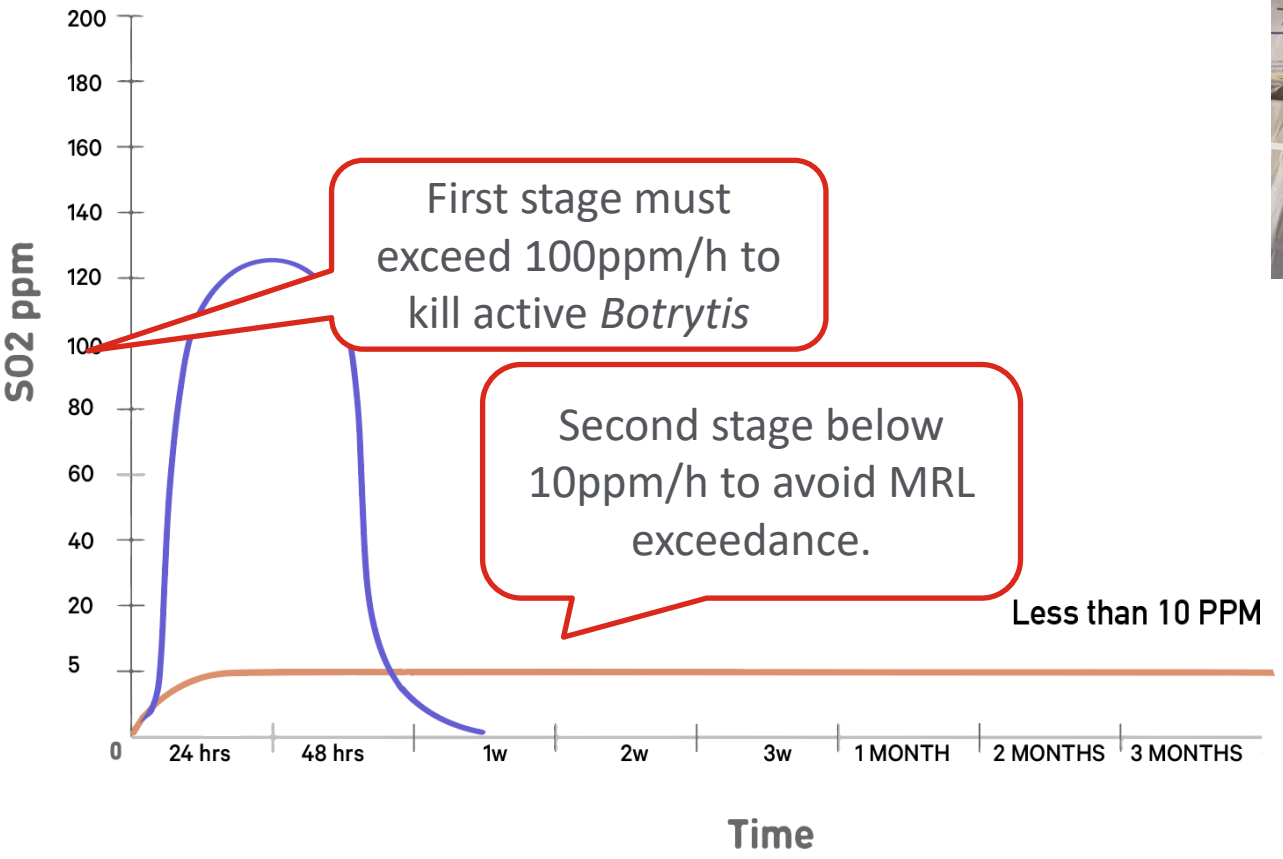
World bank index ranks Port of Cape Town 347th out of 351 container ports (above Durban and Gqeberha).

Availability of containers and ships.

Transhipment delays…

PLAN FOR LONGER SHIPPING TIME

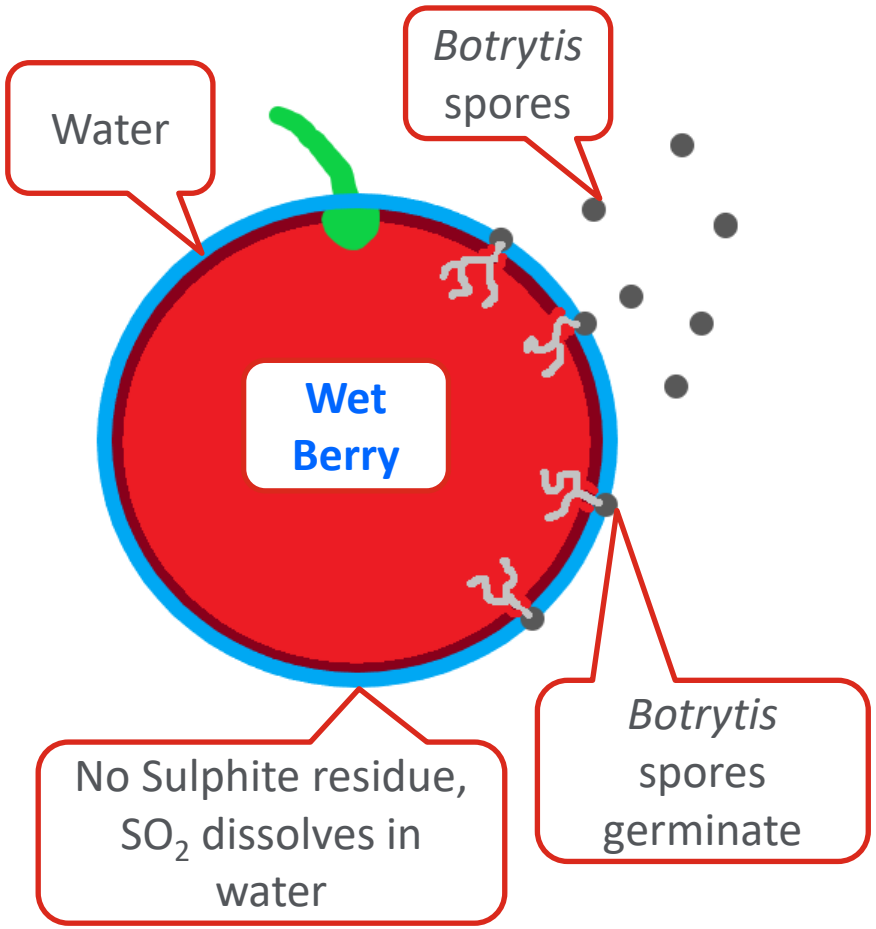
11. SO2


SO2 ppm
200
180
160
140
120
100
80
60
40
20
5
0
First stage must exceed 100ppm/h to kill active *Botrytis*
Second stage below 10ppm/h to avoid MRL exceedance.
Less than 10 PPM
24 hrs
48 hrs
1w
2w
3w
1 MONTH
2 MONTHS
3 MONTHS
Time

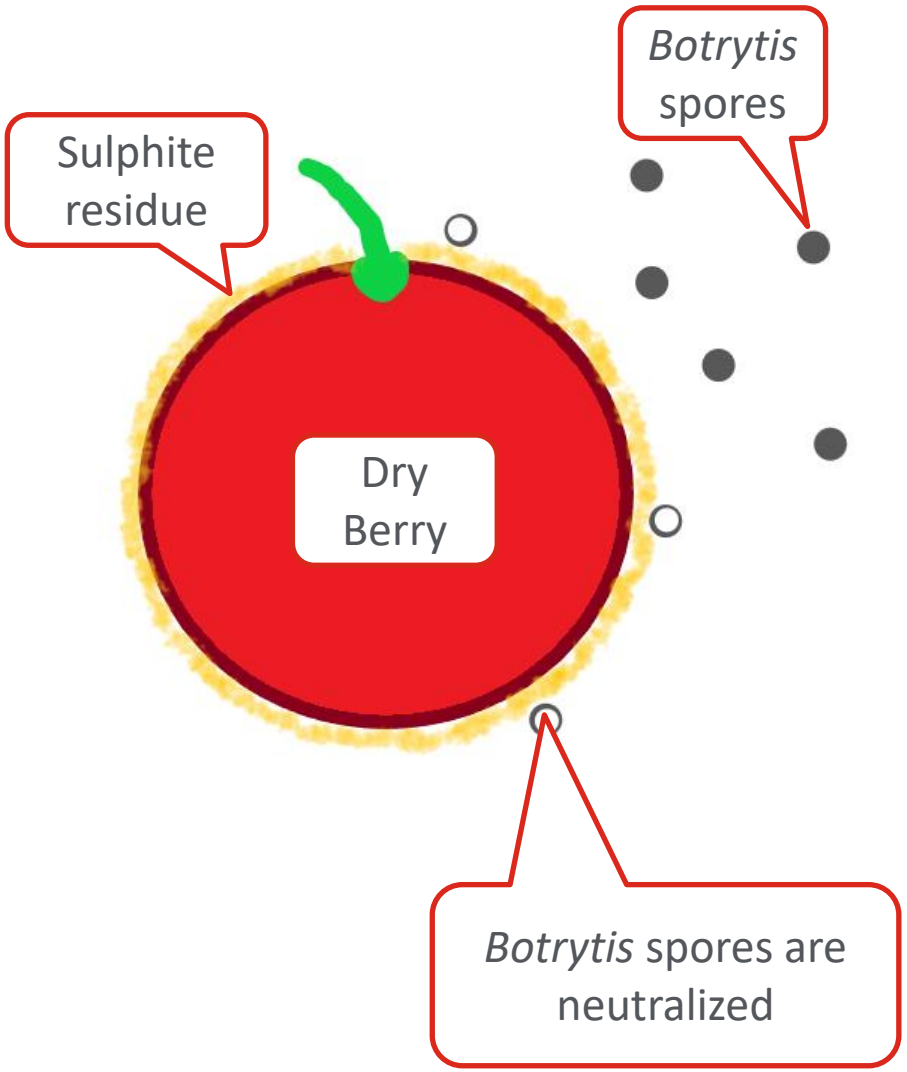

PENGUIN
GRAPE GUARD
GRAPE GUARD
SAFE, HIGH EFFICIENT AND RAPID RELEASE

11. WET GRAPES & SO2 DON'T MIX WELL

- **Wet Berry:**



Dry Berry:



11. COVERAGE IS KING – FIT THE RIGHT SIZE

- **The SO_2 sheet should cover at least 80% of the surface of the carton**
- **SO_2 gas is heavy and sinks down into the grapes**
- **The old way of thinking: 1g of $Na_2S_2O_5$ per kg of fruit is not valid anymore**

11. WHAT IF IT RAINS?

11. WHAT IF IT RAINS?

Dry grapes are happy grapes – inspect fruit after cooling – if too wet, **increase liner perforation size** and/or add paper on top of SO_2 sheet (MAM sheet) UNTIL fruit is dry right after cooling

Use a good dual release SO2 sheet

You can also add **additional SO2** sheets ($1^1/_2$ to 2 sheets/carton) on loose/bagged grapes (extra sheet upside down on bottom)

Use a full-sized (9kg) SO_2 sheet on punnets (only one sheet on top)

SUMMARY

- "IF YOU DO NOT MEASURE, YOU CANNOT MANAGE".
- **CONSENTRATE ON WHAT YOU CAN CONTROLE: QUANTITY AND QUALITY**
- PRODUCE HIGHEST QUALITY FRUIT WITH "LEGS" TO TRAVEL
- ADD VALUE (I.E. PUNNETS) AND MANAGE PACKAGING ON DAILY BASIS
- OPTIMISE YIELD/HA FOR QUALITY, DO NOT MAXIMIZE YIELD
- KEEP GRAPES DRY AND USE CORRECT SO2 SHEET PER CARTON SIZE

PRODUCTION COST & FARM INCOME/PROFIT

AVERAGE FOR RSA (SATI)	2020	HIGHER YIELD	HIGHER YIELD
PRODUCTION COST + DEPRECIATION/HA	R485 565	R541 974	541 974
CARTONS PRODUCED/HA	3 549	5 000	5 000,00
PRODUCTION COST/CARTON	**R136,80**	**R108,39**	**R108,39**

SOURCE: SATI FOR 2020

SAME YIELD & 10% HIGHER PRICE FOR QUALITY	2 020	AT HIGHER YIELD	AT HIGHER YIELD & PRICE
INCOME/CARTON	R136,80	R136,80	R150,48
PROFIT/CARTON	R0,00	R28,41	R42,09
PROFIT/HA	**R0**	**R142 026**	**R210 426**

THANK YOU

DANKIE

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