



10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

24 NOV
10
| DEC 2018
NORWICH WEST
SOUTH AFRICA



Comprehensive Management of Dehydration in Table Grapes

Daniel Silva, Biochemist, M.Sc. in Innovation
Infruta S.A.

Exporting is a risky business

An aerial photograph of a large container ship sailing on the open ocean. The ship's deck is densely packed with colorful shipping containers in shades of red, blue, green, and orange. In the foreground, several large green cylindrical tanks are visible. The ship's superstructure, including the bridge and various deck equipment, is visible towards the rear of the vessel. The water is a deep blue-green with white foam from the ship's wake.

Each passing day has an impact on
the quality of your fruit



10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

26 NOV
TO
1 DEC 2023
SOMERSET WEST
SOUTH AFRICA

4%

weight loss

Can represent over **\$115 MM** in losses per season for the Chilean market.



PROTEKU
GRAPE GUARDS
PROTEKU INFRUTA
EUROPA CHILE
"A grape idea"



10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

26 NOV
TO
1 DEC 2023
SOMERSET WEST
SOUTH AFRICA



Symptoms of dehydration



Physical process

Associated with water loss in tissues.
Directly related to environmental conditions (Temperature and humidity).

Chemical/enzymatic process

Associated with oxidative and degradative processes related to metabolism and senescence (“browning”).



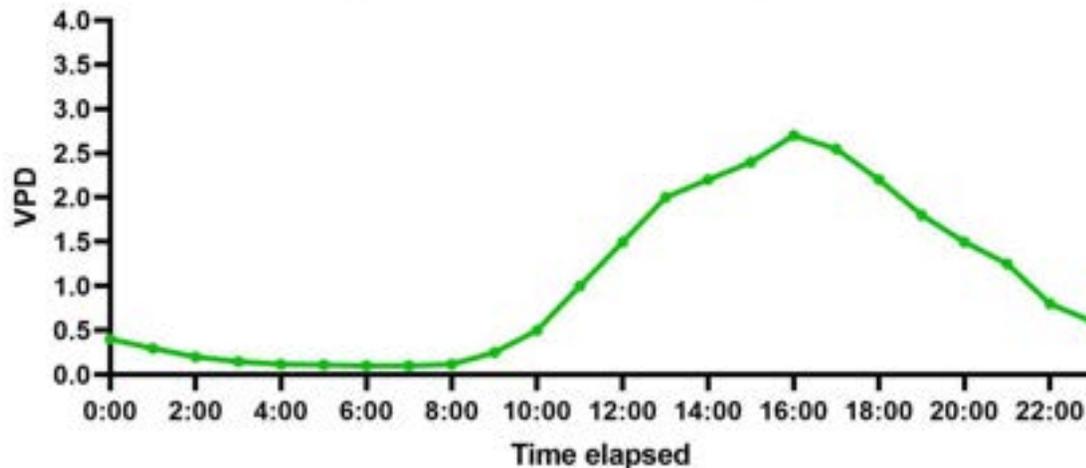
10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

26 NOV
TO
1 DEC 2023
SOMERSET WEST
SOUTH AFRICA



Environmental conditions for dehydration - Vapor Pressure Deficit (VPD)

Vapor Pressure Deficit Progression



01

Vapor Pressure Deficit: difference between the amount of moisture in the air and how much moisture the air can hold when it is saturated.

02

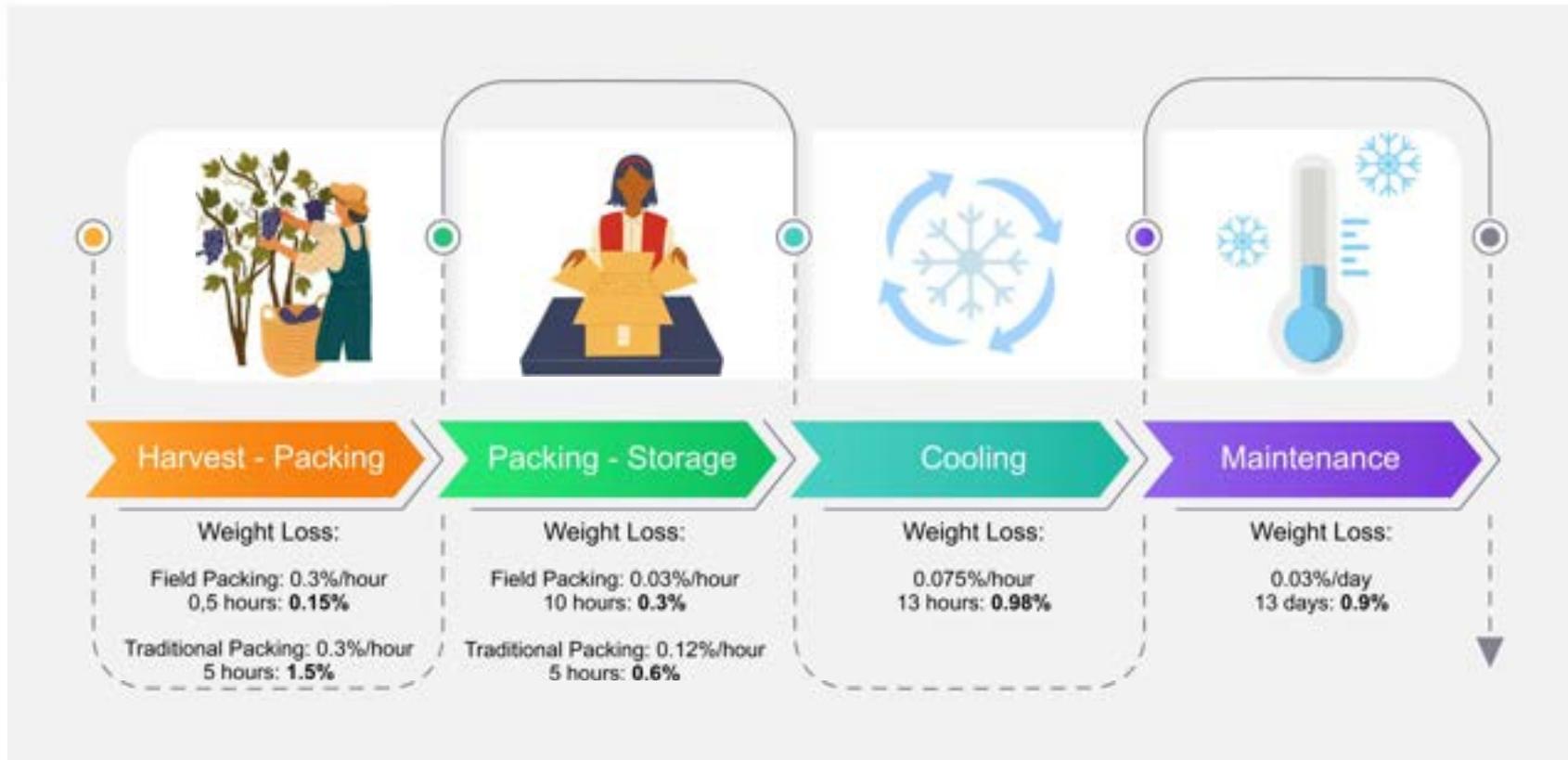
The lower the VPD, the less dehydrating the environment is for the fruit.



Exportadora Río King - A Case Study

Central Valley in Chile

The Value Chain



Where should we focus our efforts?



10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

20-22 NOV
2019
LIVIGNO (ITALY)

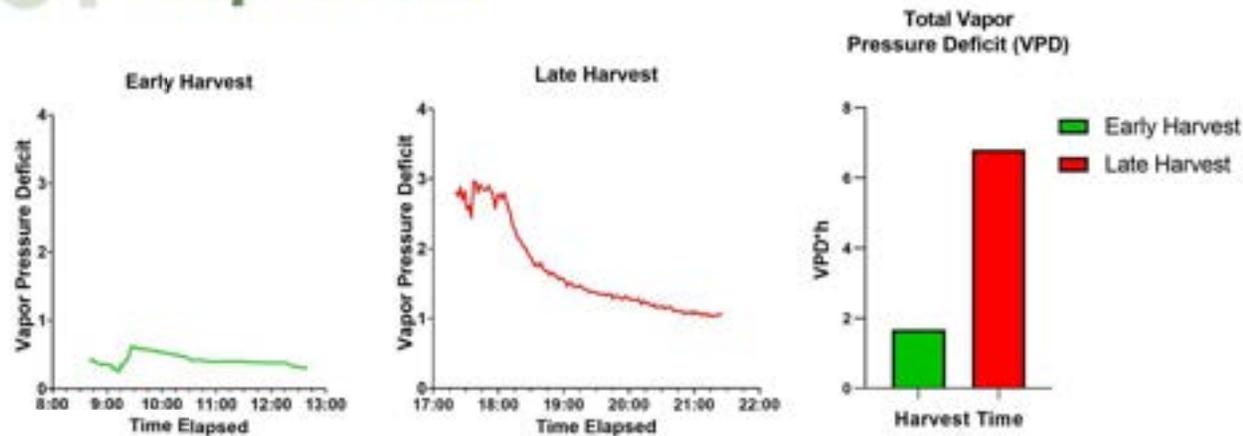
CONGRESS HOTEL
GRAND HOTEL

Early vs late harvest

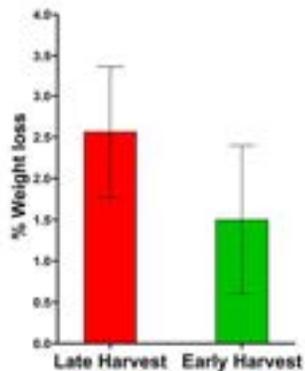




01 Vapor Pressure Deficit



02 Weight loss in table grape bunches



Sweet Globe table grapes after 40-day storage.

Early harvest significantly decreases VPD exposure and weight loss.



10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

20-22 NOV
2023
Ljubljana, Slovenia
SLOVENIA 2023

Use of harvest box covers

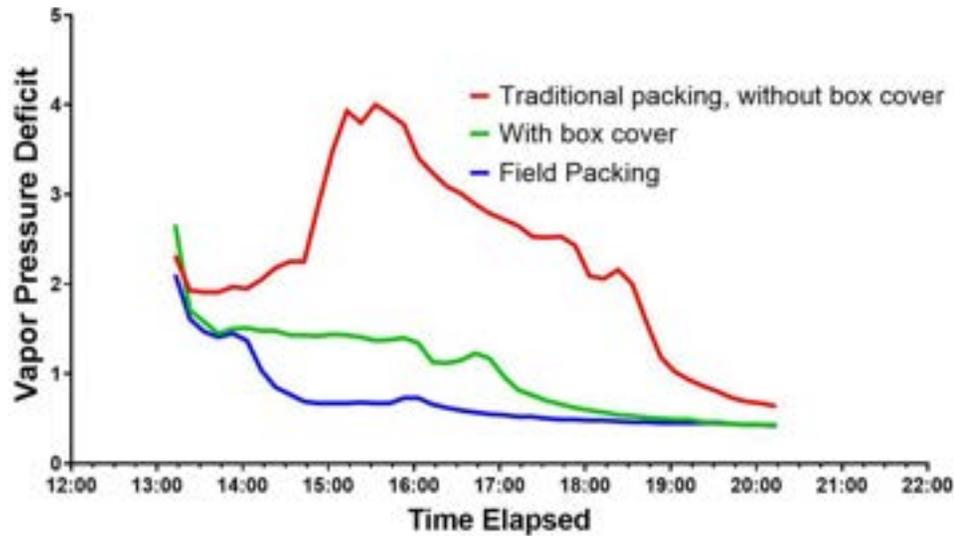


PROTEKU
GRAPE GUARDS
PROTEKU INFRUTA
EUROPA ONLY
"A grape idea"

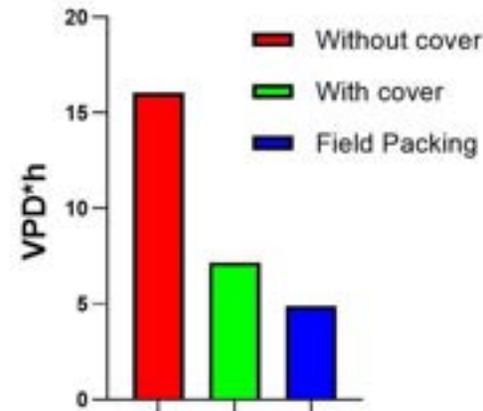


01 Vapor Pressure Deficit

Use of box covers during harvest



Total Vapor Pressure Deficit (VPD)



Use of harvest box covers in traditional packing operations significantly decreases VPD exposure to levels similar to field packing conditions.



10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

20-22 NOV
2023
Ljubljana, Slovenia
SLOVENIA 2023

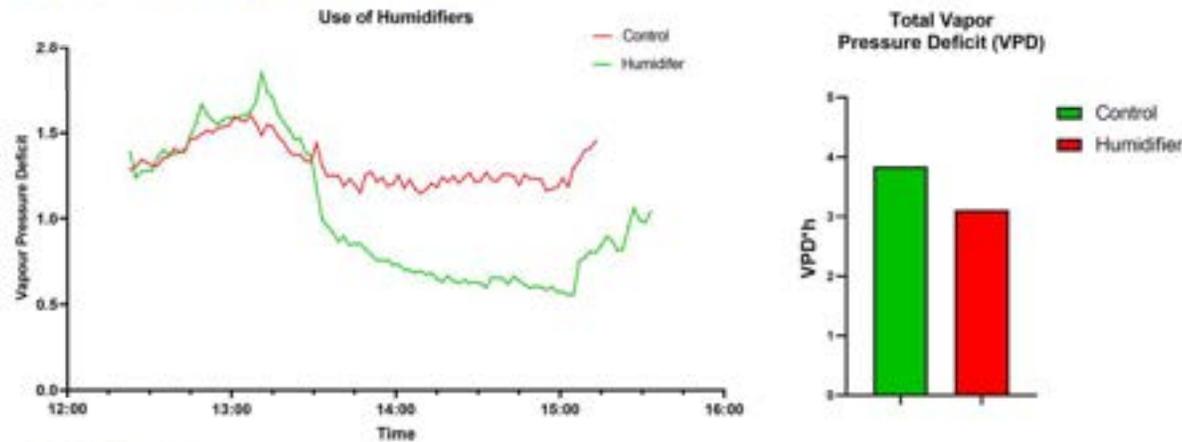
Use of humidifiers in packing houses



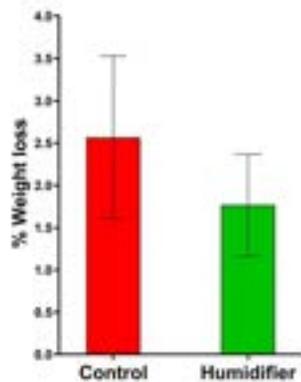
PROTEKU
GRAPE GUARDS
PROTEKU INFRUTA
EUROPA ONLY
"A grape idea"



01 Vapor Pressure Deficit



02 Weight loss in table grape bunches



Sweet Celebration table grapes after 40-day storage.

Use of humidifiers in packing house decreases VPD exposure and weight loss.



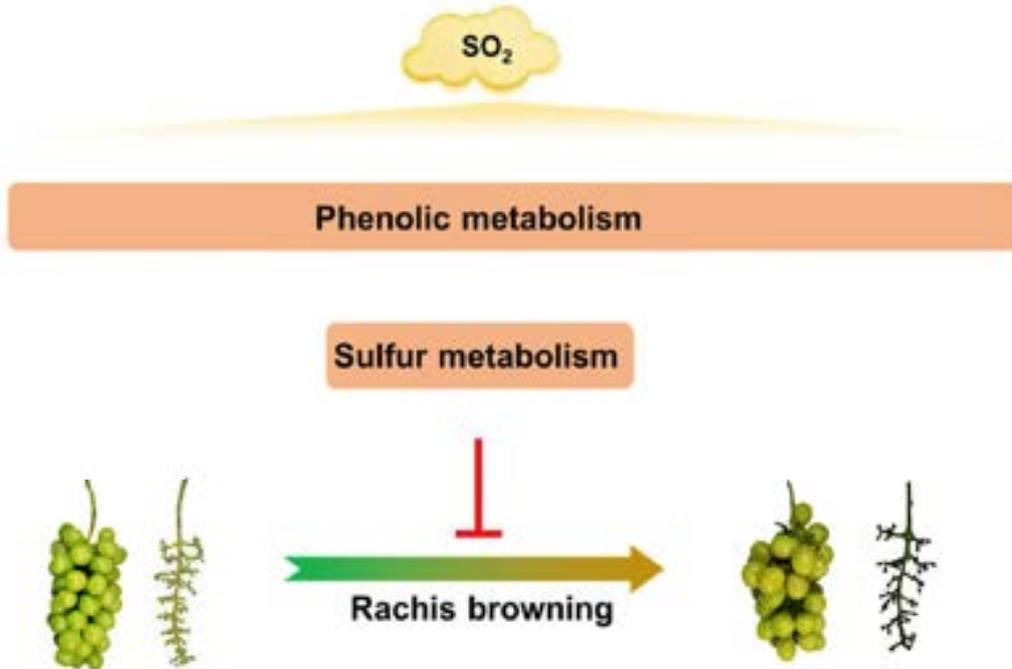
10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

20-22 NOV
2023
LIVORNO (ITALY)
CONGRESS HOTEL
GRAND HOTEL

Use of (the right) SO₂ pads



PROTEKU
GRAPE GUARDS
PROTEKU INFRUTA
EUROPA ONLY
"A grape star"



Sulfur dioxide to minimize browning

Choosing the right SO₂ pad can make a difference in one of the key symptoms of rachis dehydration.

Especially useful in the later stages of the chain where fruit is already in transit.

Image edited from: Li, Z., Chen, S., Qi, M., Yang, M., Yuan, H., Xu, Y., Huang, J., Li, D., Zhou, W., Yuan, Y., Luo, Z., & Li, L. (2023). Inhibition of postharvest rachis browning of table grapes by sulfur dioxide: Evidence from phenolic metabolism and sulfur assimilation. *Postharvest Biology and Technology*, 204, 112413. <https://doi.org/10.1016/j.postharvbio.2023.112413>.



01
02
03



Evidence-based approaches are the way forward

01

'Harvest, pack and cool as quickly as possible' still holds true, but deviations from ideal conditions require careful allocation of resources.

02

Growers and exporters have several tools at their disposal to minimize the effects of dehydration and browning.

03

Solution providers must also keep this approach in mind to deliver technologies and services with real added value.



10TH
INTERNATIONAL
TABLE GRAPE
SYMPOSIUM

24 NOV
10
| DEC 2023
NORWICH WEST
SOUTH AFRICA



Comprehensive Management of Dehydration in Table Grapes



Acknowledgments to Víctor Guzmán and Daniela Henríquez from Exportadora Río King.