Lowering rachis dehydration with nutritional solutions as a way to prevent rachis browning on the seedless table grape, variety Sable

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THE ISSUE: RACHIS BROWNING

Adriatica

Rachis browning is one of the **major storage problems** which reduces the **quality** and **marketability** of table grapes.

Rachis browning is a cumulative process of **water loss** from berry and rachis in concomitance with **oxidative processes**, where the activity of polyphenol oxidase enzyme is involved.

The **rachis** is the most susceptible tissue because it is composed of **unprotected herbaceous tissues** and **thin epidermis,** unlike **berry** that has a **cuticle** composed of **wax** and **thick epidermis** that acts as a barrier for dehydration.

Rachis browning's symptoms are:

- **dehydration**, **with** or **without** rachis **browning**
- **berry shatter**
- **wilting** and **shriveling** of berries during marketing

THE SOLUTIONS

DIFFERENT STRATEGIES to prevent rachis browning:

- **Optimal storage conditions**: 0,5°C, relative humidity (RH) of 90–95%, for 40–100 days.
- Use of **sulphur dioxide**
- **Short-term gaseous treatments**: 3-days CO_2 treatment at 0°C
- Use of **ventilated bags** or **liners** to increase RH
- **Chemical approach**: PGRs
  Coatings
  Antioxidants
- ……..

NOTE: The final result is affected by the cultivar, by the maturity at harvest and by the time between harvest and cooling

K-Adriatica SOLUTION

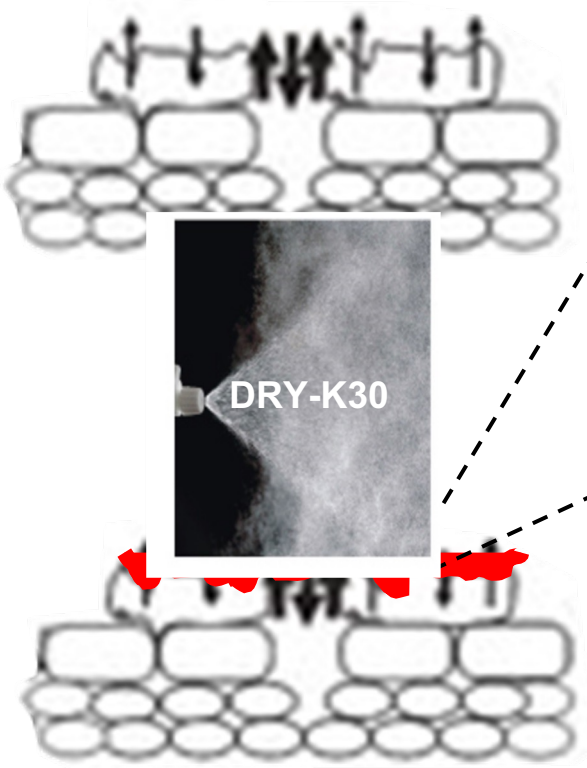
K-Adriatica solution is based on a **chemical approach**. It combines:

BALANCED and **TARGETED NUTRITION**
to streghten the rachis structure

KAMAB 26

Technology based on **COATING** by biopolymers and **ANTIOXIDANTS**.

DRY-K30



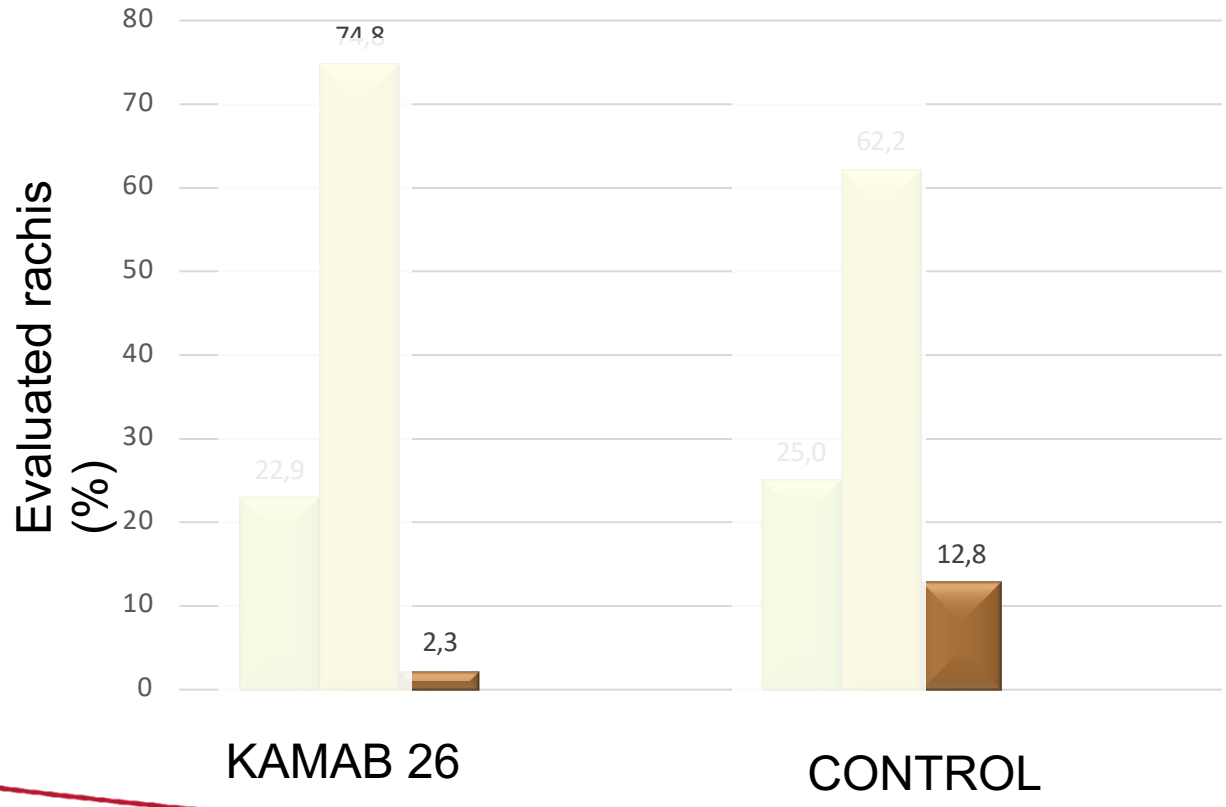
- Modulates transpiration
- Antimicrobial activity
- Fungistatic activity
- Antioxidant activity

K-Adriatica SOLUTION

«Side effect» of **KAMAB 26** applications on **rachis browning** incidence, after **45 days** of **cold storage**, in table grape, cv *Red Globe*

Season: 2003-2004

APPLICATION time: 2 applications, 15 and 7 days the harvest



Only **2,3%** of **KAMAB 26** treated rachises fall in **Hard browning** category

VS

12,8% of **CONTROL** rachises fall in **Hard browning** category

Light browning

Moderate browning

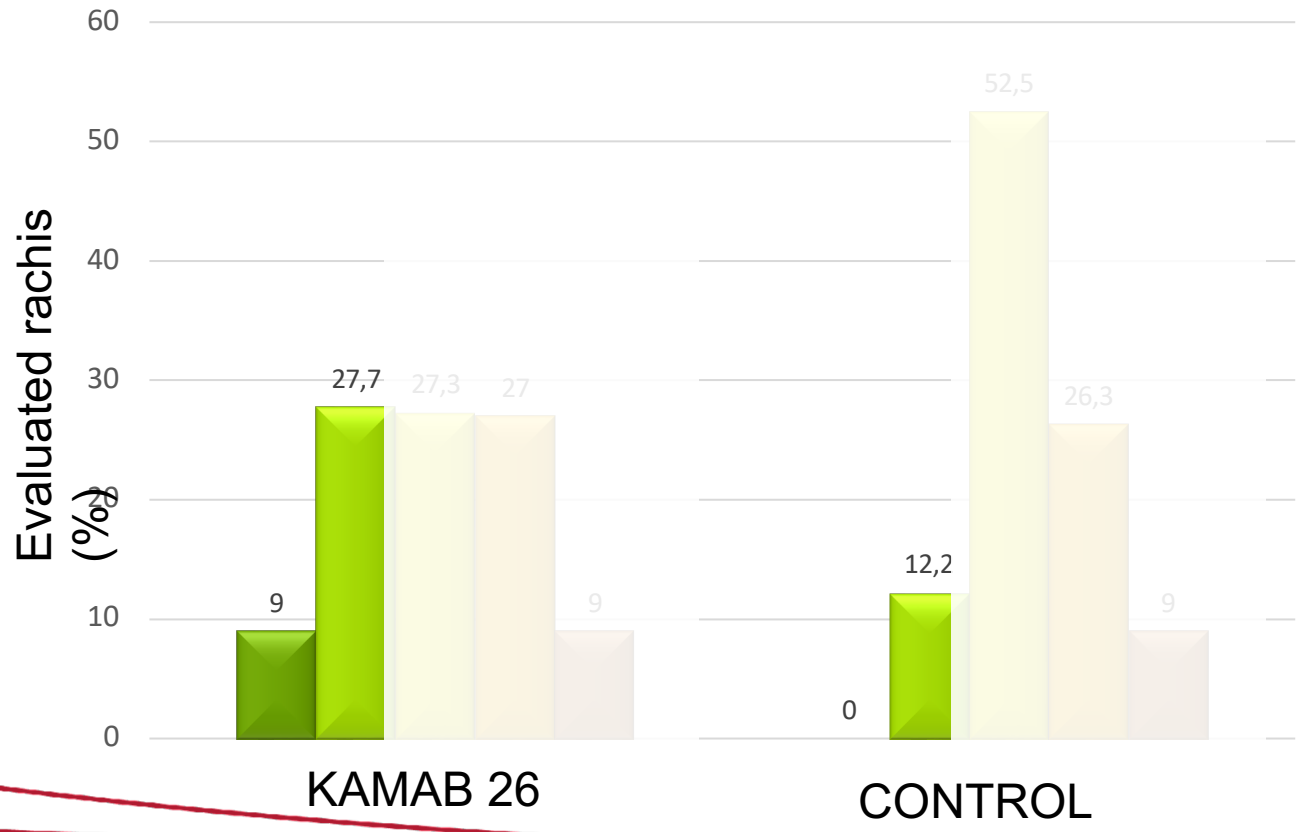
Hard browning

K-Adriatica SOLUTION

«Side effect» of **KAMAB 26** application on **rachis browning** incidence, after **30 days** of **cold storage**, in table grape cv *Thompson seedless*

Season: 2008-2009

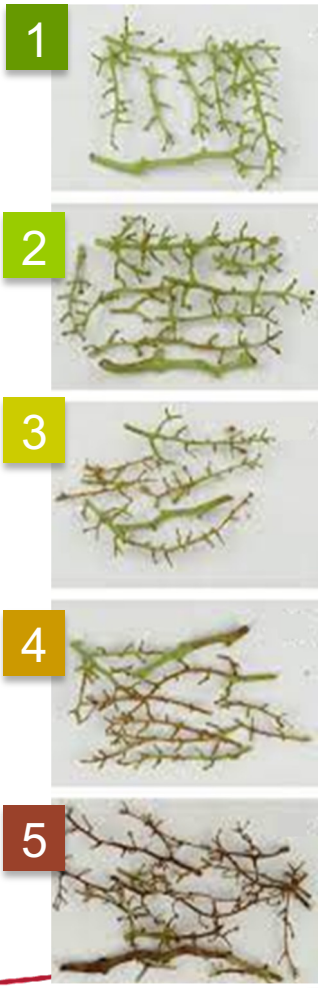
APPLICATION time: 4-5 applications, starting from pre-flowering up to veraison



More than **36%** of **KAMAB 26** treated rachises fall in **1+2** categories

VS

More than **12%** of **CONTROL** rachises fall in **1+2** categories



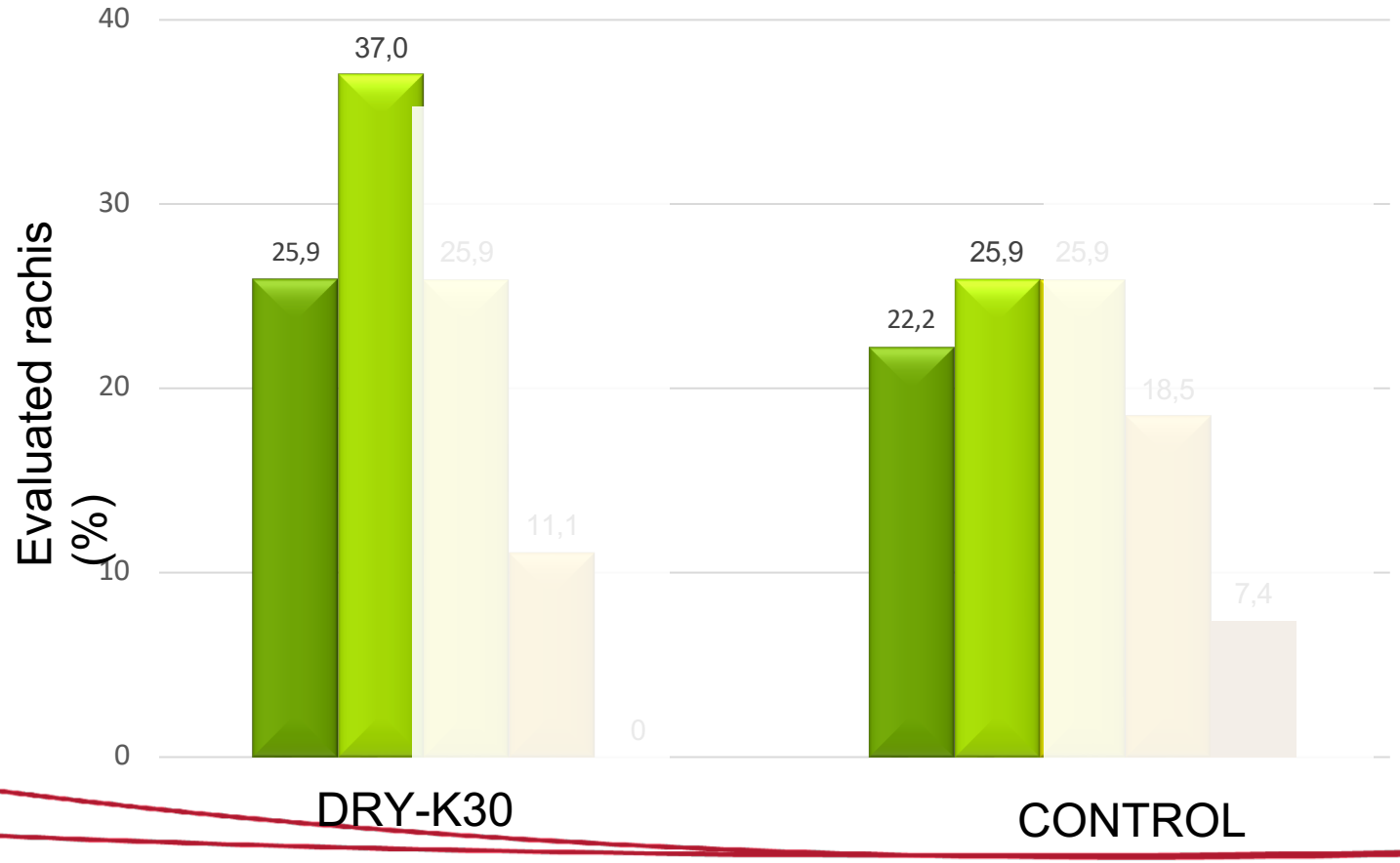
K-Adriatica SOLUTION

«Side effect» of **DRY K-30** applications on **rachis browning** incidence, after **30 days** of **cold storage**, in table grape cv *Melanie*

Italy

Season: 2021

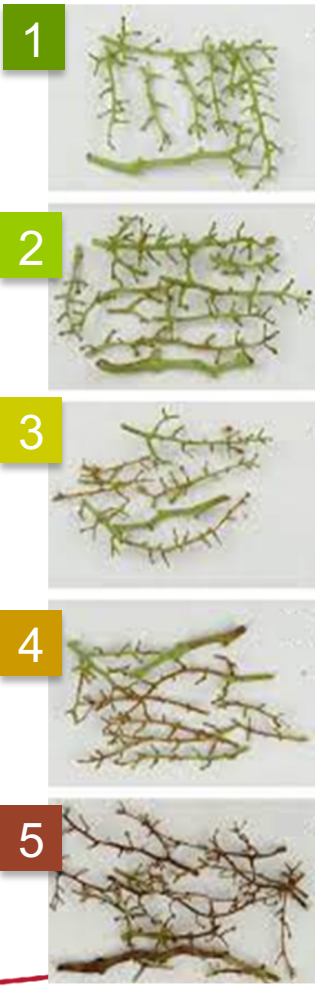
APPLICATION time: 3 applications at berries beginning to touch, 15 days and 7 days before harvest



More than **62%** of **DRY-K 30** treated rachises fall in **1+2** categories

VS

More than **48%** of **CONTROL** rachises fall in **1+2** categories



K-Adriatica SOLUTION

Graper THINKING BETTER FIELDS

Adriatica

Effect of **K-Adriatica solution** on **Yield** and **Quality**, at **harvest** and **post-harvest**, in table grape ***cv. Sable***

Italy

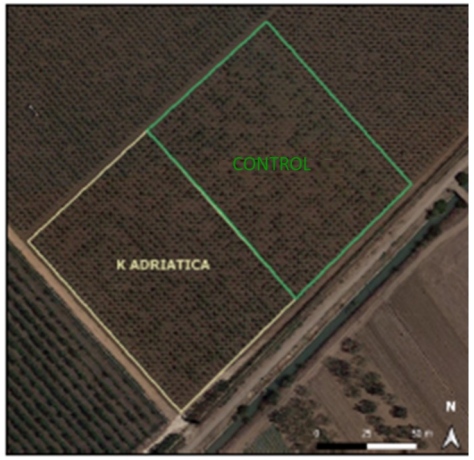
Season: 2022

Phenological stage	Inflorescence visible	Inflorescence clearly visible (2-5cm)	Fruit set	Berry pea sized (4-8mm)	Veraison	Ripening
K-Adriatica	eK-Ion Max 3l/ha Trace element 1,5l/ha KAMAB 26 6 Kg/ha	eK-Ion Max 3l/ha Trace element 1,5l/ha DRY-K30 6 Kg/ha	eK-Ion Max 3l/ha KAMAB 26 6 Kg/ha	eK-Ion Max 3l/ha KAMAB 26 6 Kg/ha	DRY-K30 6 Kg/ha	DRY-K30 6 Kg/ha

K-Adriatica SOLUTION

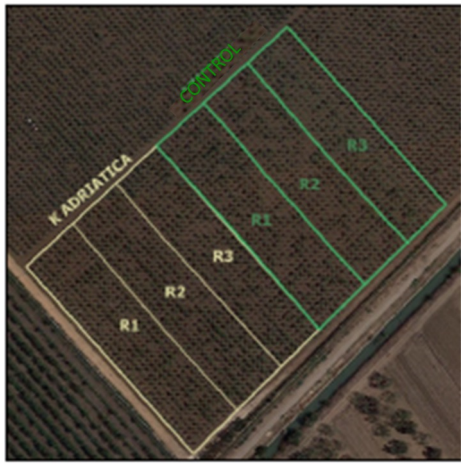
GENERAL TRIAL INFO

Trial site



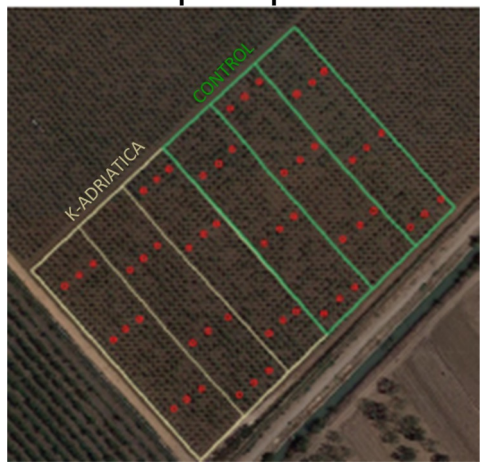
Farm: Serini, Ginosa (TA), Italy
Latitude: 41°04'37.9"N
Longitude: 16°43'24.8"E
Altitude: 240 m a.s.l.

Experimental design



Total trial area: 2 ha
Plot size: 1 ha
3 replicates

Sampled plants



Position of the plants (replicates) used for evaluation

CROP DATA

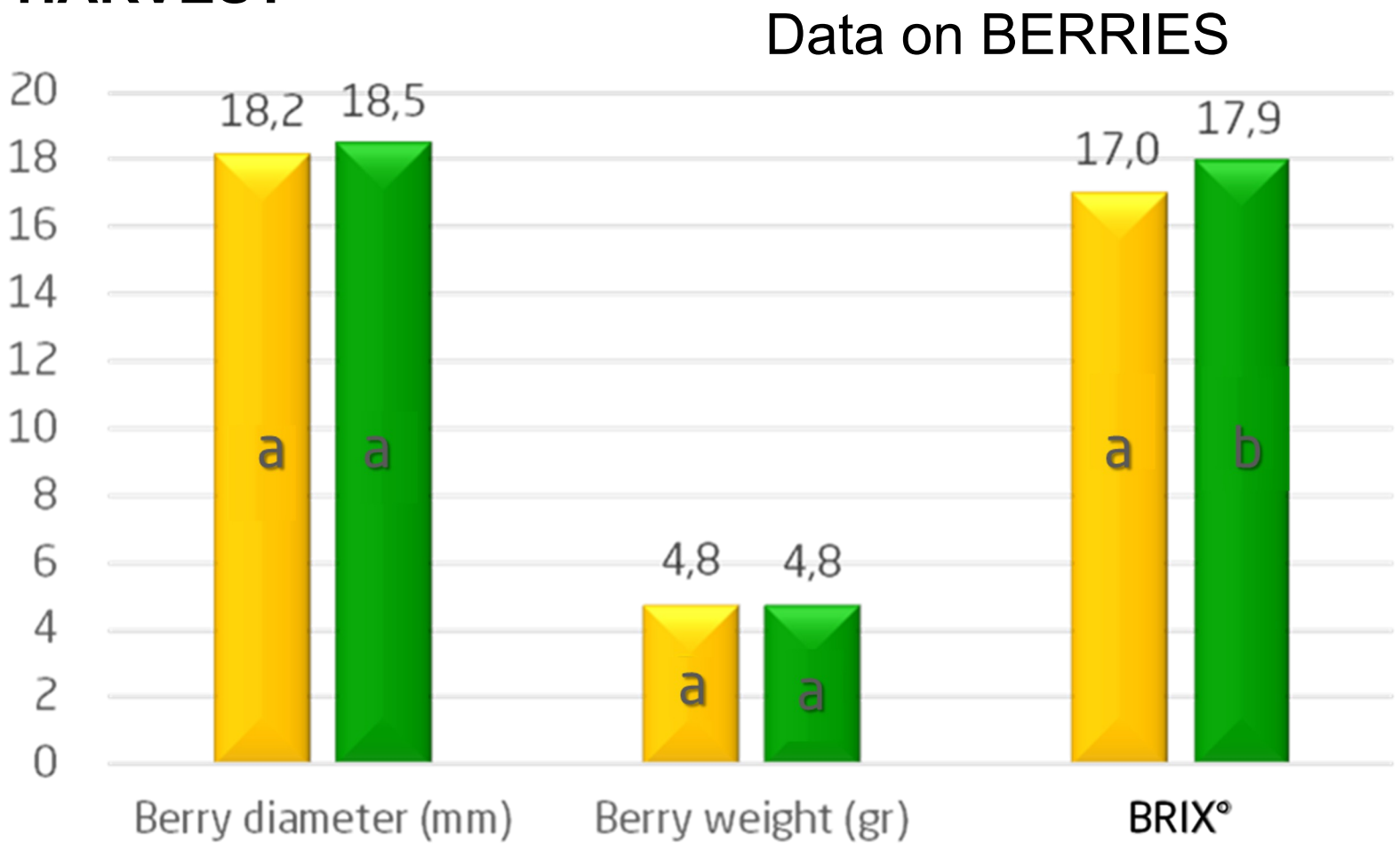
Crop: Table grape
cv: *Sable*
Rootstock: 1103
Plant age: 4 years
Training system: Tendone
Plastic film and drop irrigation
Row x plant spacing: 3 x 3,2 m

SPRAYING CALENDAR

Phenological stage	Inflorescence visible	Inflorescence clearly visible (2-5cm)	Fruit set	Berry pea sized (4-8mm)	Veraison	Ripening
K-Adriatica	eK-Ion Max 3l/ha Trace element 1,5l/ha KAMAB 26 6 Kg/ha	eK-Ion Max 3l/ha Trace element 1,5l/ha DRY-K30 6 Kg/ha	eK-Ion Max 3l/ha KAMAB 26 6 Kg/ha	eK-Ion Max 3l/ha KAMAB 26 6 Kg/ha	DRY-K30 6 Kg/ha	DRY-K30 6 Kg/ha
CONTROL	Seaweed exctract 3l/ha Trace element 1,5l/ha	Seaweed exctract 3l/ha Trace element 1,5l/ha	Seaweed exctract 3l/ha Calcium based product 3l/ha	Seaweed exctract 3l/ha Calcium based product 3l/ha	Magnesium Sulphate 4Kg/ha	Magnesium Sulphate 4Kg/ha

K-Adriatica SOLUTION

RESULTS at HARVEST

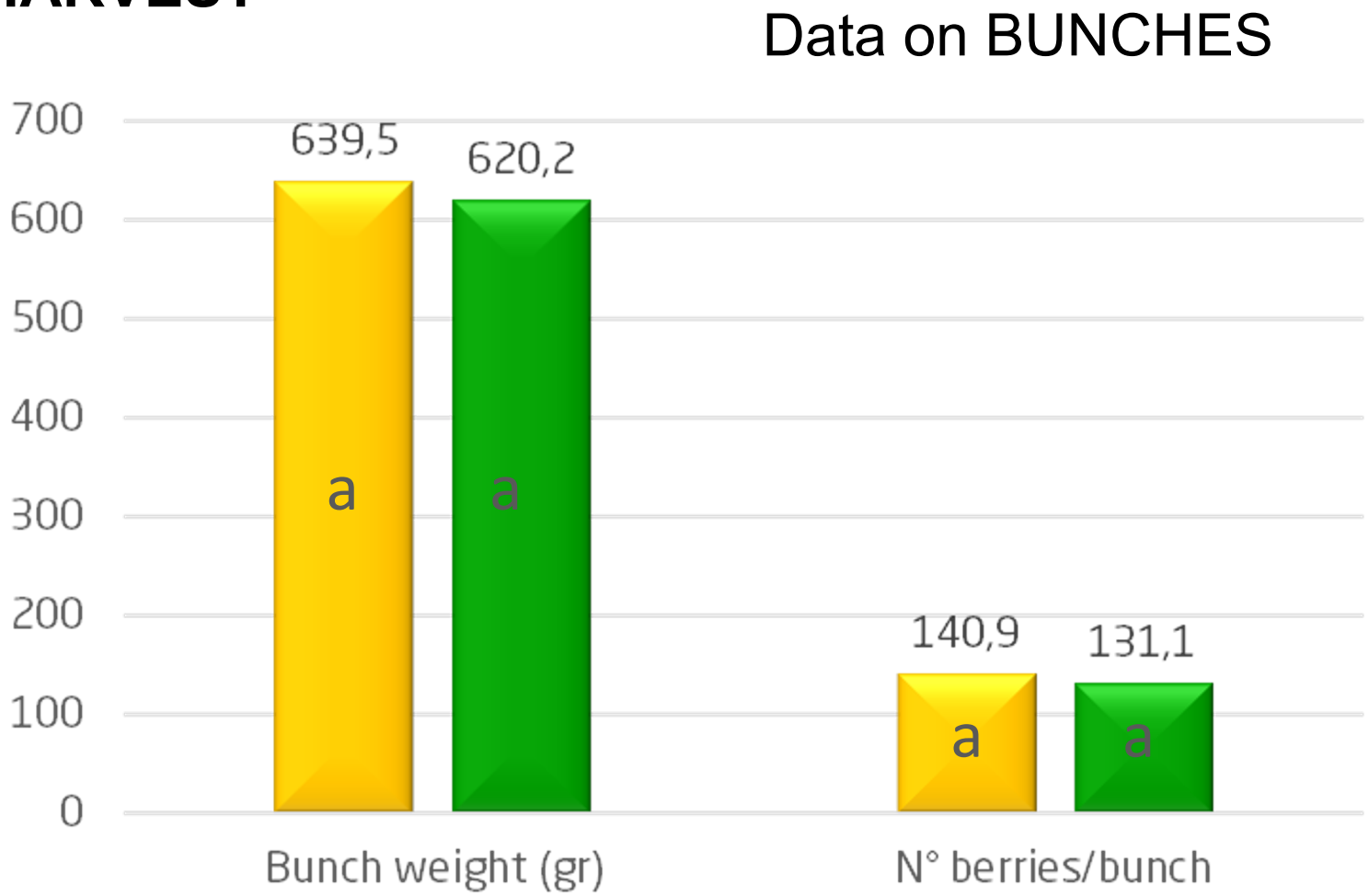


Statistical analysis was performed using parametric ANOVA ($p<0.05$)

K-Adriatica SOLUTION

Adriatica

RESULTS at HARVEST



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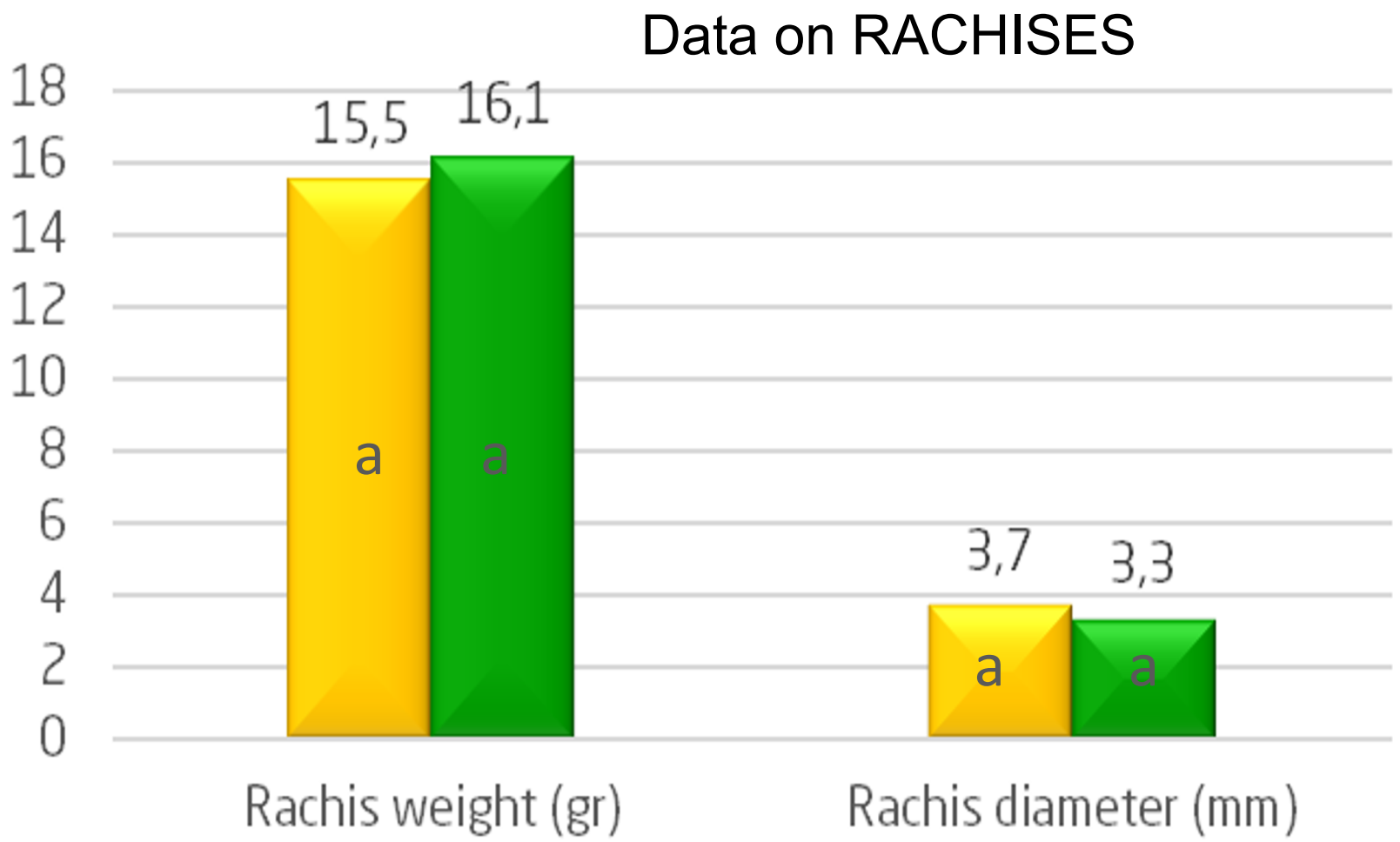
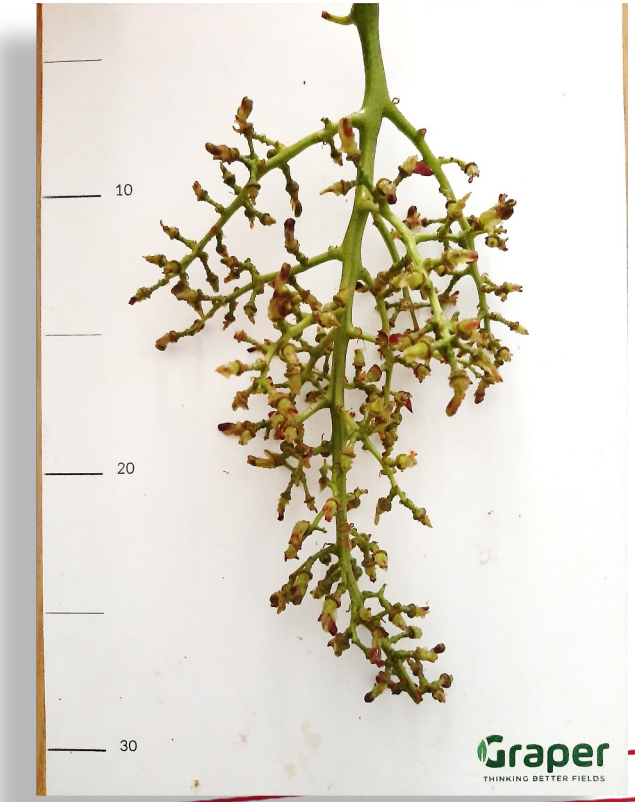
K-Adriatica SOLUTION

Adriatica

RESULTS at HARVEST



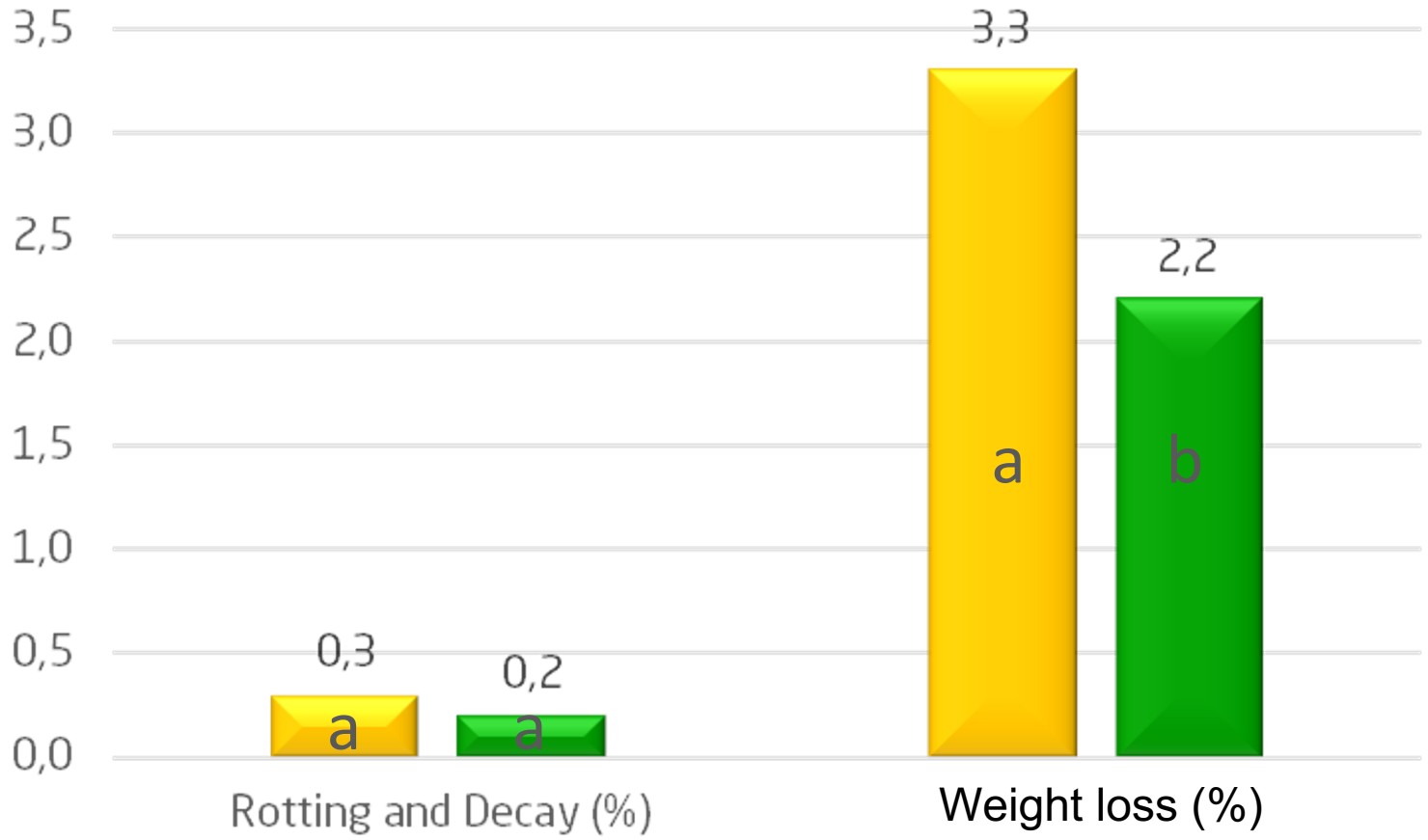


Statistical analysis was performed using parametric ANOVA ($p<0.05$)

K-Adriatica SOLUTION

RESULTS
at POST-HARVEST

Data were collected after 30 days of cold storage using SmartPac technology



CONTROL

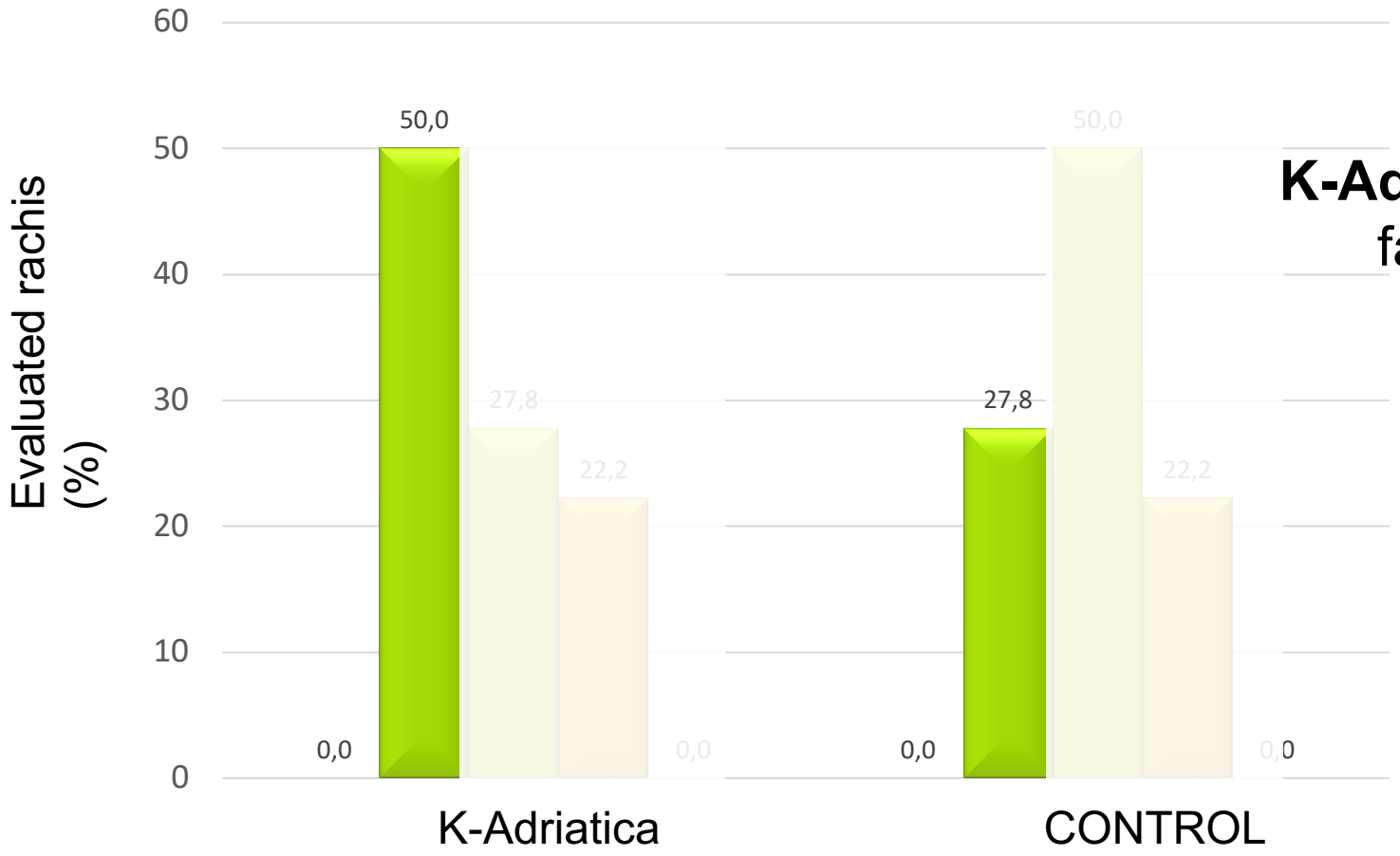
K-Adriatica

Statistical analysis was performed using parametric ANOVA ($p<0.05$)

K-Adriatica SOLUTION

RESULTS
at POST-HARVEST

Data were collected after 30 days of cold storage using SmartPac technology



More than **50%** of **K-Adriatica** treated rachises fall in **1+2** categories

VS

More than **27%** of **CONTROL** rachises fall in **1+2** categories

K-Adriatica SOLUTION

CONCLUSIONS

The **efficacy** of these strategy is based on the **synergistic action** between **balanced** and **targeted nutrition**, preventing physiological disorders, and strengthening the tissues and **biopolymers**, which act as **antioxidants** and also form a **protective biofilm** that reduces evapotranspiration and prevent water and weight loss

Taken together, the data indicate **KAMAB 26/DRY-K 30** as a **promising/efficient** tool in **preventing rachis dehydration** and ultimately **browning**, thus improving fruit quality and prolonging shelf-life

ACKNOWLEDGMENTS

Thanks to ALL K-Adriatica team, especially to R&D Group

Adriatica

Special thanks to GRAPER team that carried out the trials

Graper
THINKING BETTER FIELDS

Thank you for your attention!

For any further question and info visit us at our stand S1