

Impact of grape ripening and post-harvest withering on must composition and fermentation kinetics

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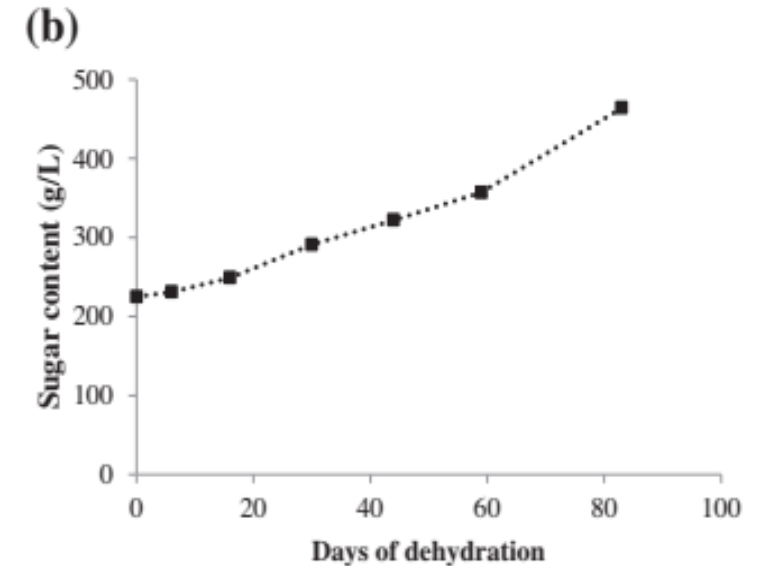
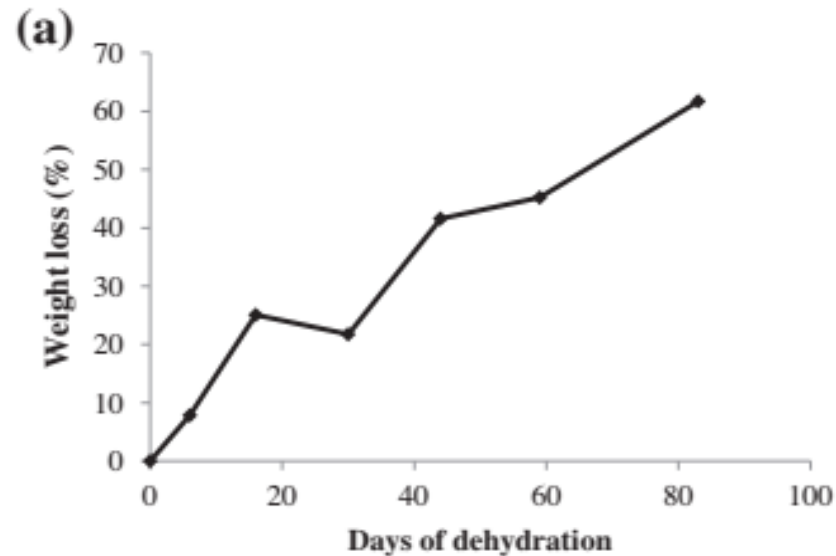
Grape withering

Grape dehydration is "*The dynamic process of water loss from the berries occurring [...] under more or less controlled environmental conditions.*"

(Mencarelli and Tonutti, 2013)

Weight loss → water loss → **concentration** of:

- Sugars → higher alcohol potential
- Secondary metabolites (phenols, aroma)



Grape withering

- Different grape varieties can respond differently in terms of dehydration rate and resulting chemical composition.
- Harvest timing → different ripeness levels can significantly influence this process

(Scalzini et al., 2023)



Red straw wines of Italy

STRAWINE



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Aim of the study

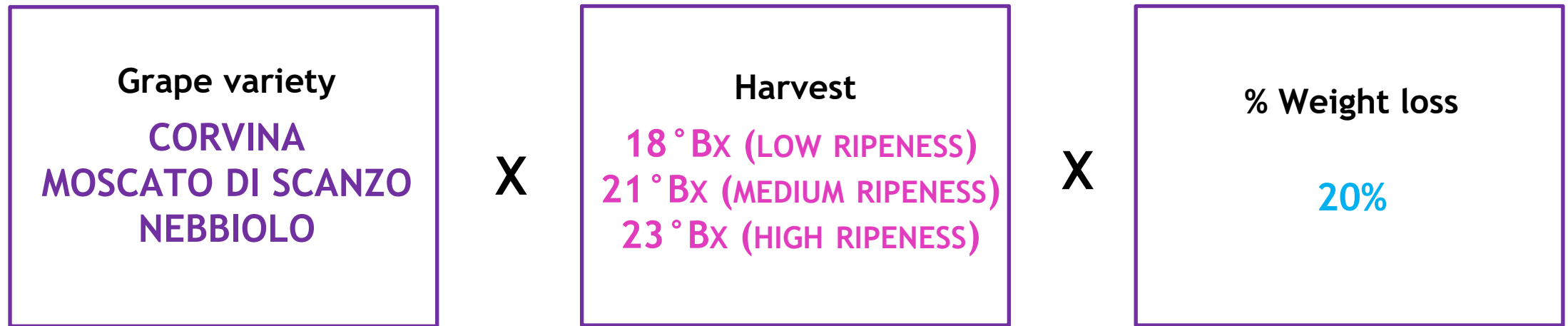
Impact of harvest timing/ withering duration still needs further clarification



Elucidate the influence of harvest on:

- *Withering process*
- *Composition of must*
- *Composition of straw wine*

Methodological approach



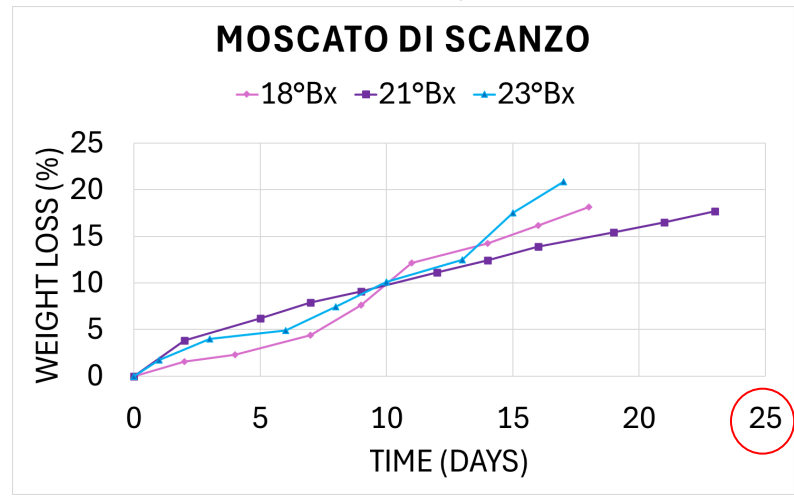
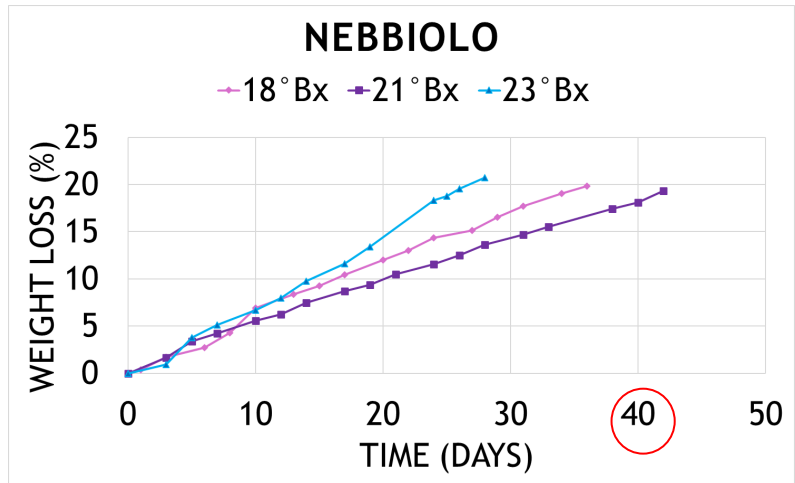
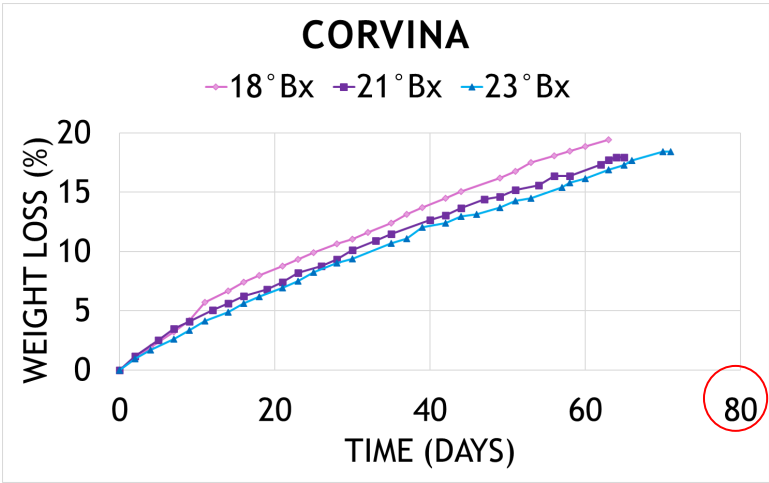
Musts analysis:

-
- Sugar concentration
 - Readily assimilable nitrogen
 - pH
 - Titratable acidity



Microvinification trials
with skin maceration

Harvest x Withering



	Daily weight loss (g/day)
C 18° Bx	0.1
C 21° Bx	0.1
C 23° Bx	0.1

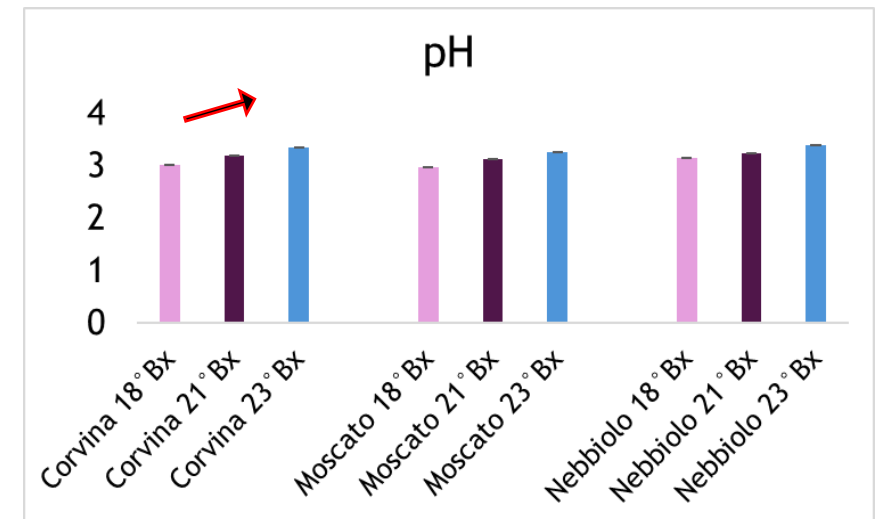
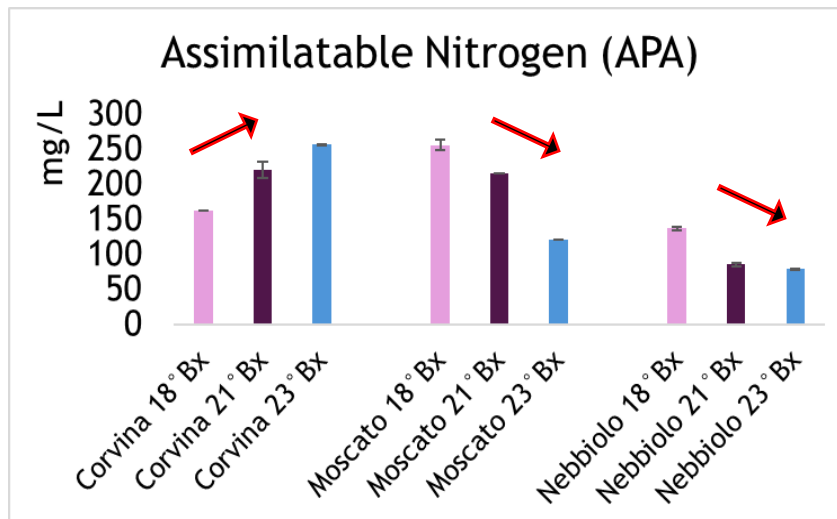
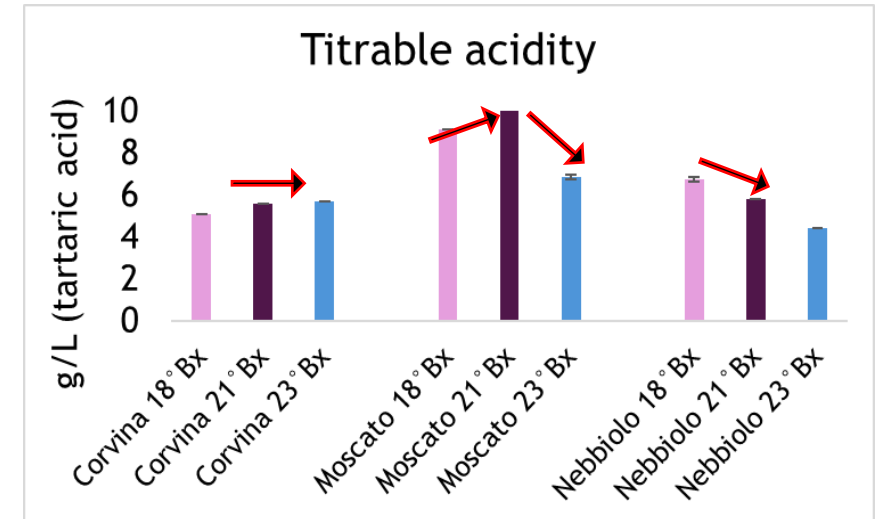
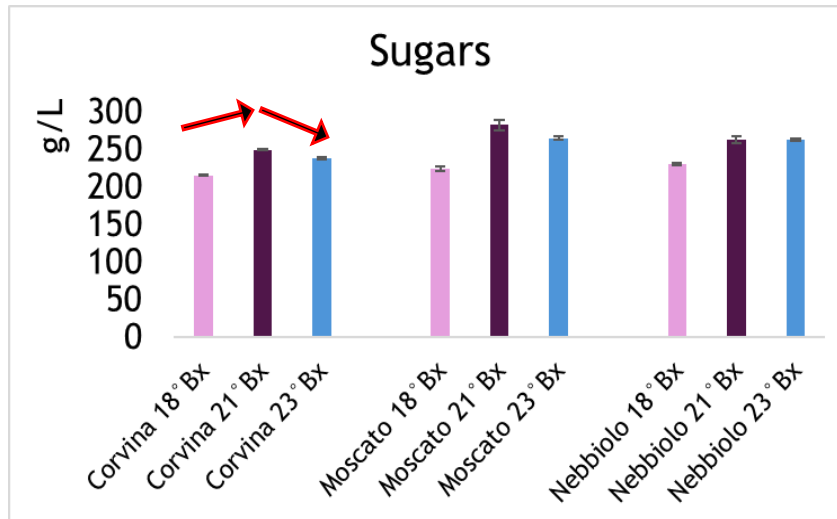
	Daily weight loss (g/day)
N 18° Bx	0.2
N 21° Bx	0.2
N 23° Bx	0.3



Grey mold infections >20% of grapes

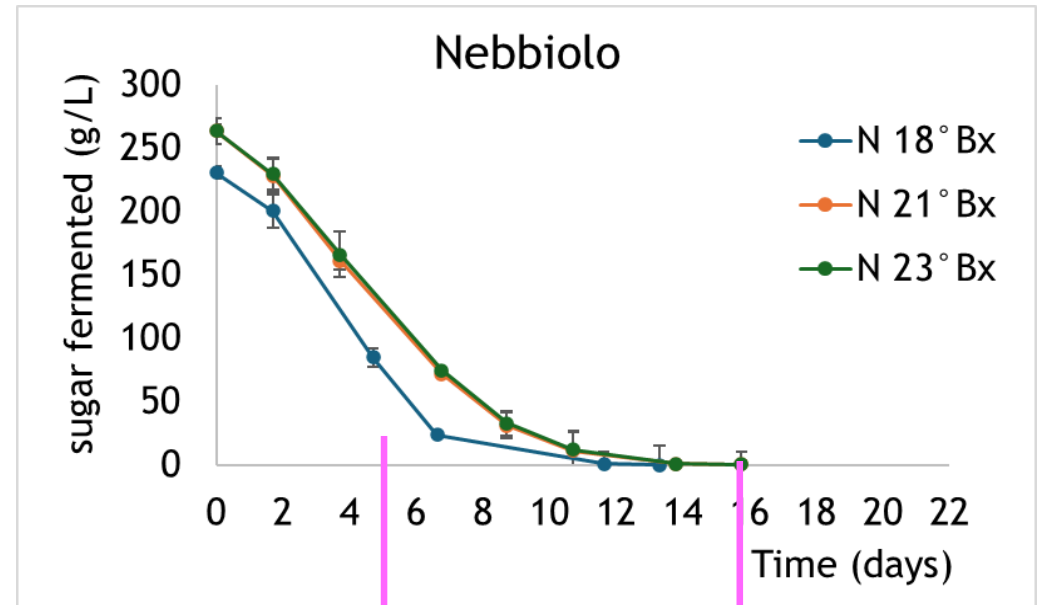
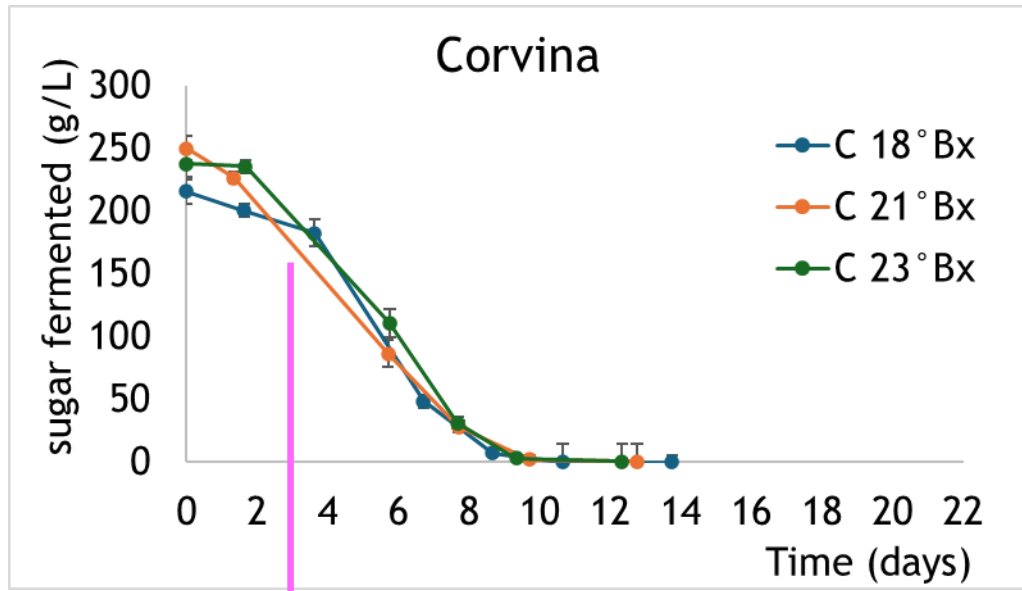
	Daily weight loss (g/day)
M 18° Bx	0.4
M 21° Bx	0.3
M 23° Bx	0.4

Must analysis



- Behavior variety-dependant
- Concentration effect is not consistent
- Depletion effect

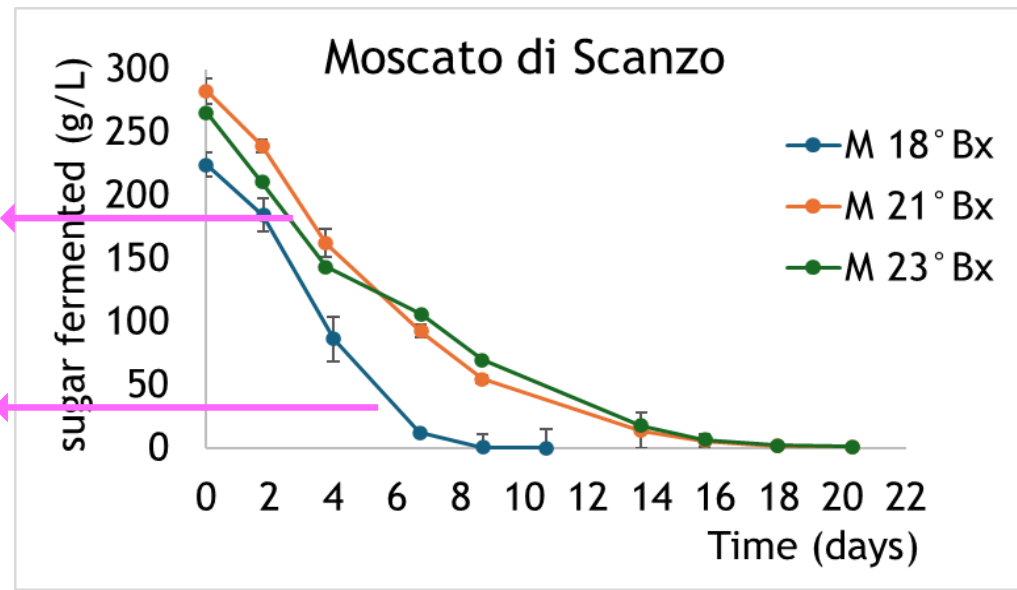
Fermentative kinetics



≈19.5
g sugar/day

≈13.5
g sugar/day

≈25
g sugar/day



≈19
g sugar/day

≈16.5
g sugar/day

Conclusions

- ✓ **Concentration effect** (of sugars and acids) **till medium ripeness**, depletion from medium to high ripeness
- ✓ **Withering time is variety dependant**
- ✓ **Fermentative kinetics is slowed down** by medium and high ripe grapes for Moscato di Scanzo and Nebbiolo
- ✓ Grapes harvested at higher ripening levels were more **susceptible to pathogen infections**

Analysis of experimental wines ongoing...

This study enhances the understanding of varietal effects during grape postharvest dehydration, focusing on red grape varieties commonly used in this production technique.



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THANK YOU FOR YOUR
ATTENTION

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