



Evaluation of pre- and postharvest strategies for reducing fungal diseases during storage of organic apples

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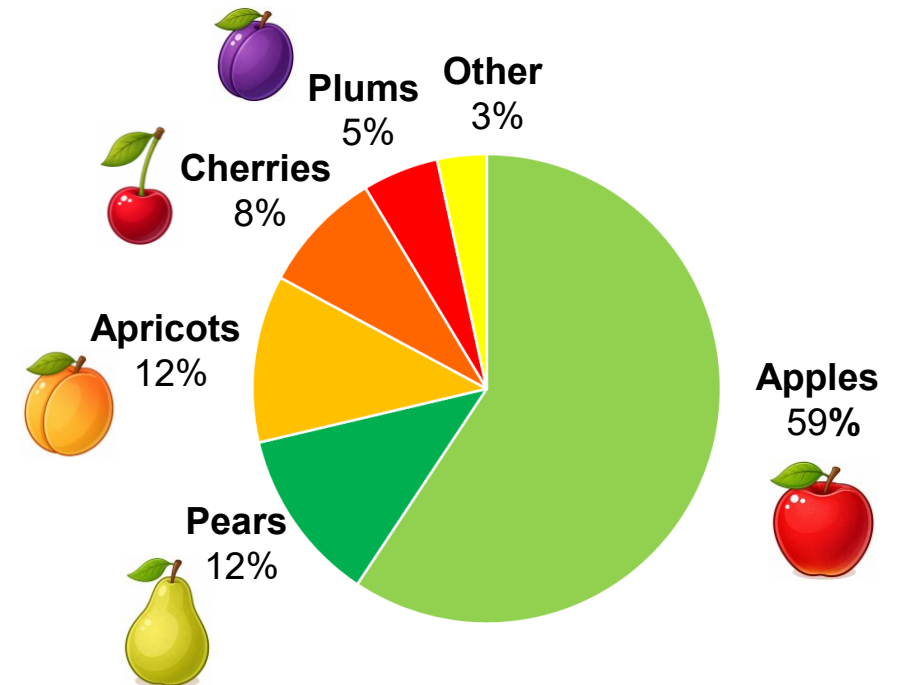
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Switzerland: a small country in the heart of Europe



Swiss fruit production ~ 6'000 hectares

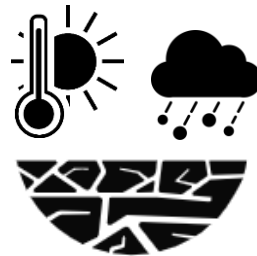


The Swiss pome fruit sector is under increasing pressure

Growing consumer expectations for environmentally sustainable fruit production



Rising frequency of extreme weather events



Reduction in the number of approved synthetic plant protection products



Disease-resistant apple cultivars (scab, fire blight, powdery mildew)

Increase in postharvest losses, mainly due to bull's-eye rot

The present study is part of the 'Innostock' project :

Evaluation of alternative pre- and post-harvest methods to synthetic fungicides for reducing storage losses in pome fruits

PRE-HARVEST

- Sulfur- and clay-based product (Myco-Sin®)
- Antagonist-based product (Blossom Protect®)
- Kaolin clay-based product (Surround®)
- Essential oils
- Pruning techniques
- ...

POST-HARVEST

- Hot water
- Ozone
- UV-C
- Ionisation
- Edible coatings
- Antagonists
- ...



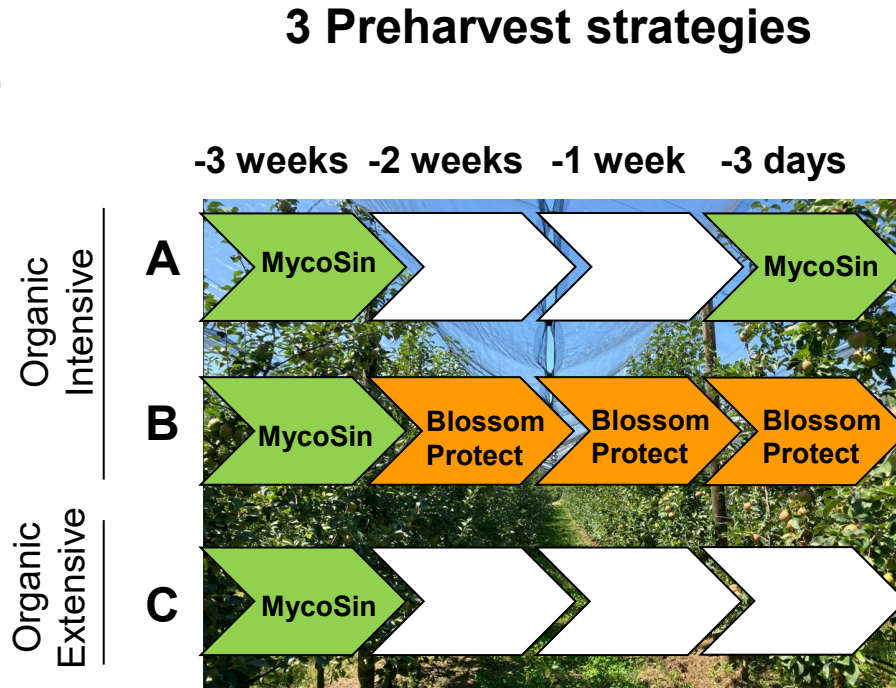
Experimental design

2 cultivars
(scab resistant)

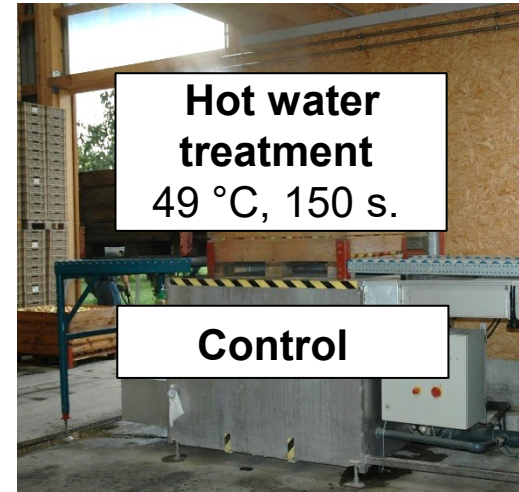
'Ladina'



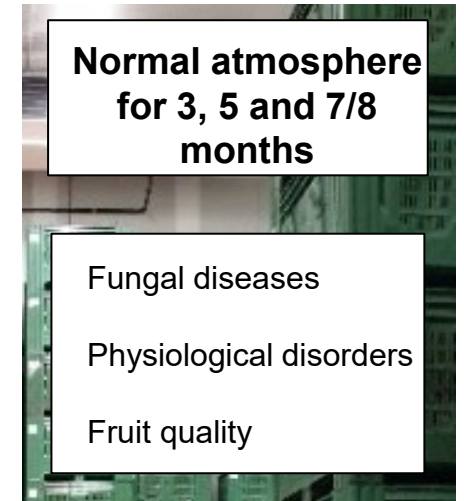
'Rusticana'



2 Postharvest strategies



Storage

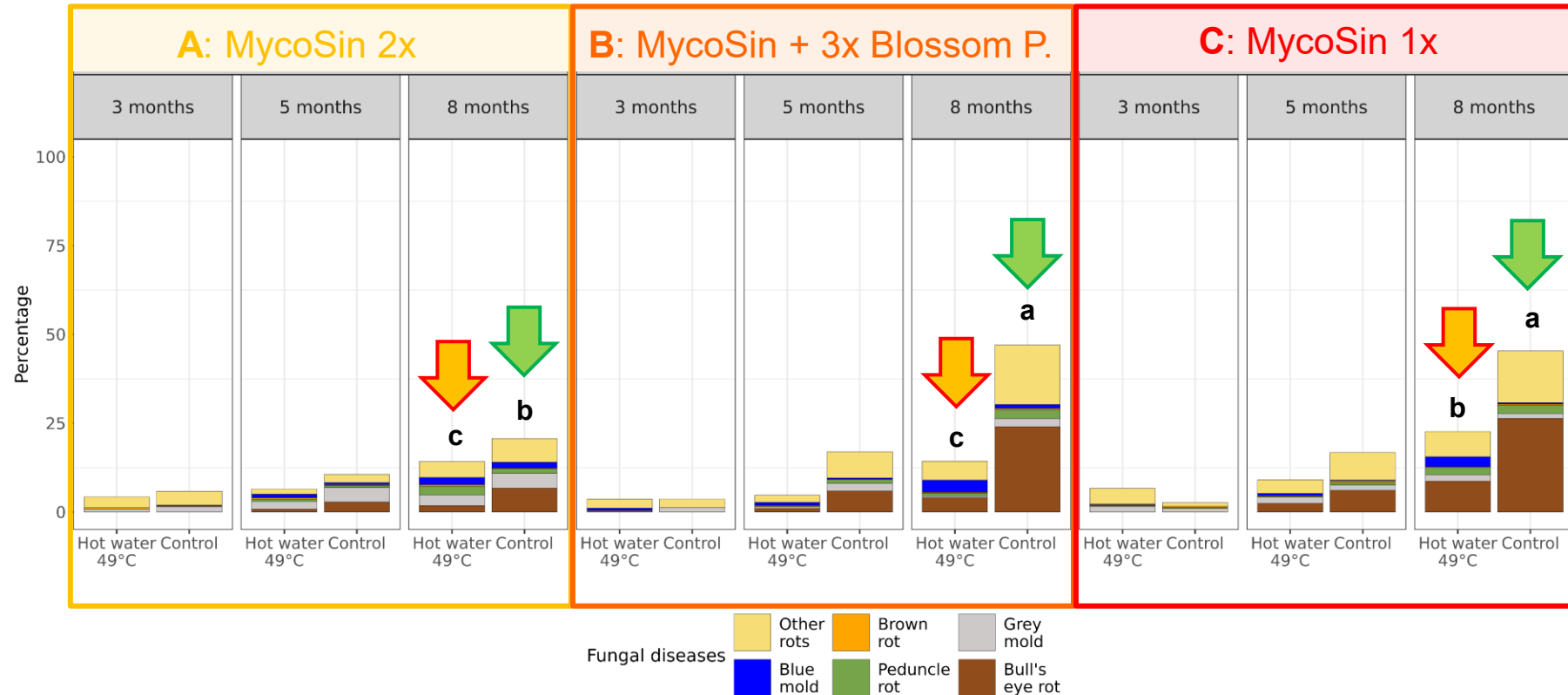




Fungal diseases: Ladina



- ➡ **Myco-Sin** applied 2x reduced fungal diseases (strategy A).
- ➡ **Hot water treatment** was effective in limiting bull's eye rot development in all preharvest strategies.

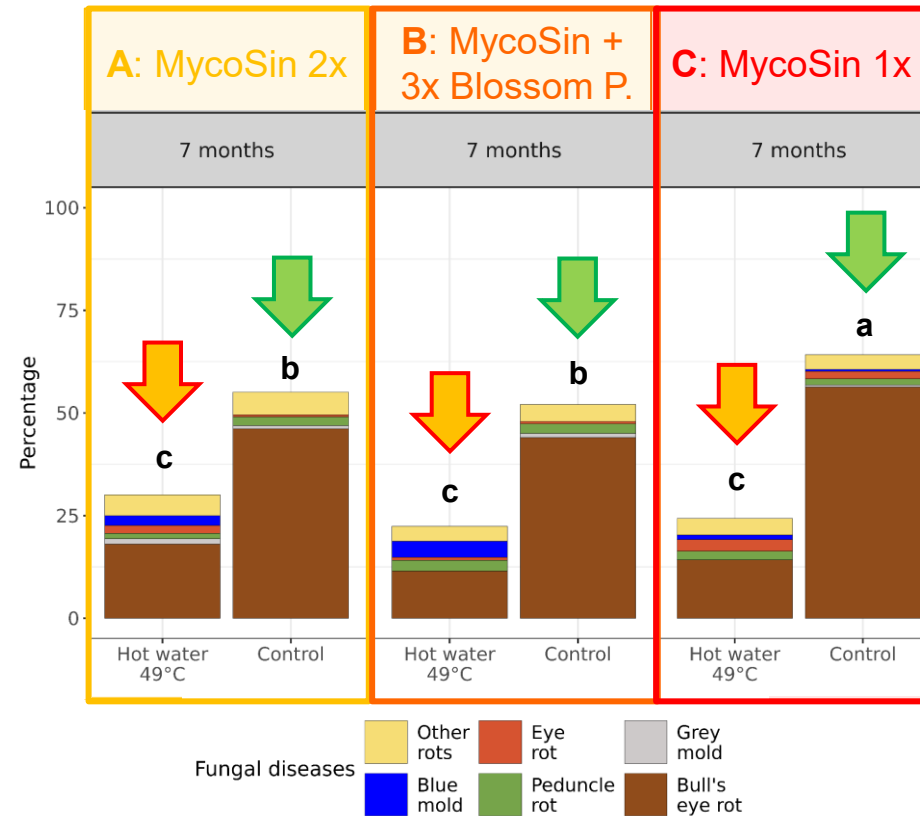




Fungal diseases: Rusticana

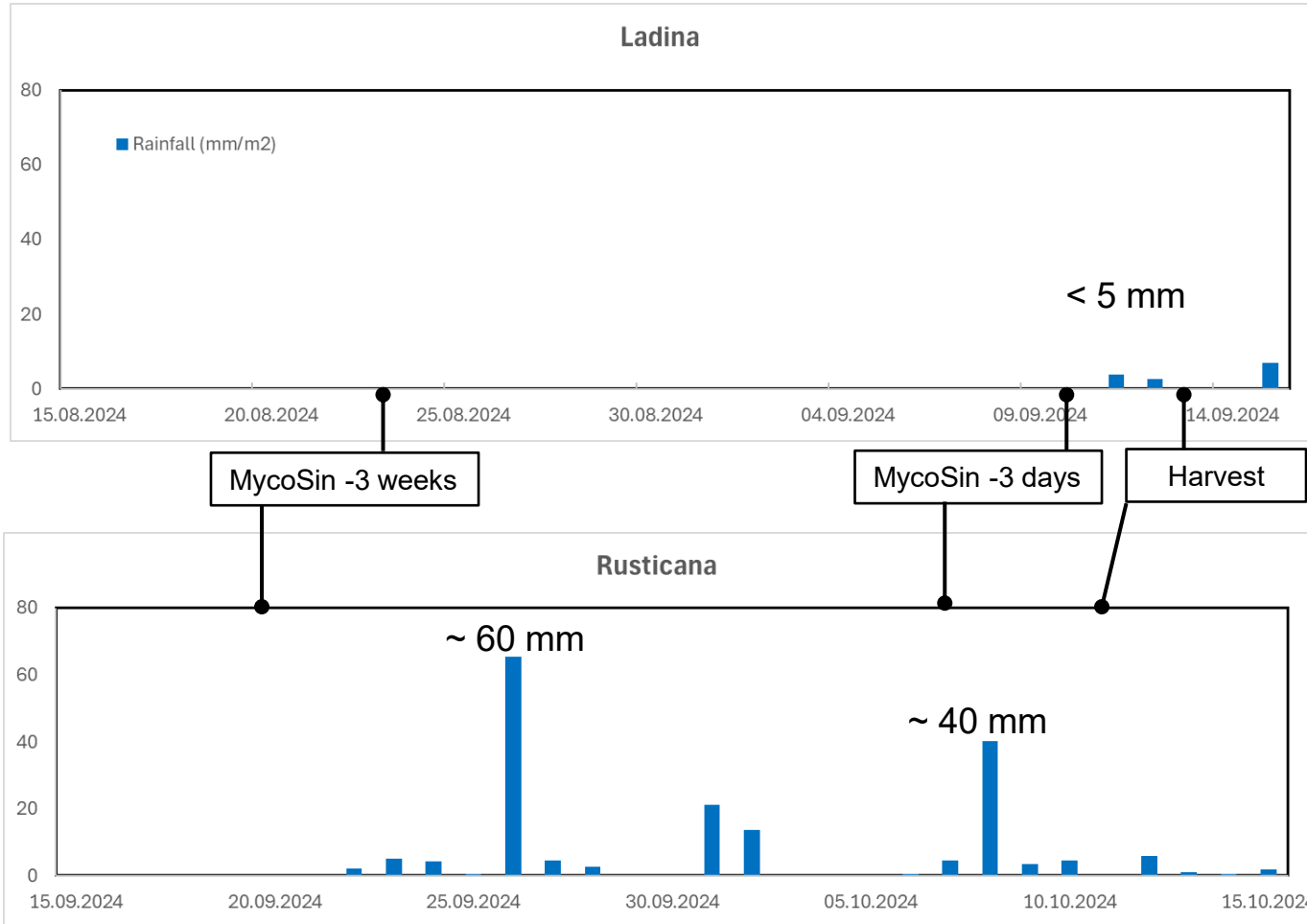


- ➔ Myco-Sin applied 2x was less effective than for Ladina.
- ➔ Hot water treatment limited the development of bull's eye rot in all preharvest strategies.





The difference in the efficacy of Myco-Sin strategy may be due to rainfalls



Ladina
Harvest: 13.09.2024

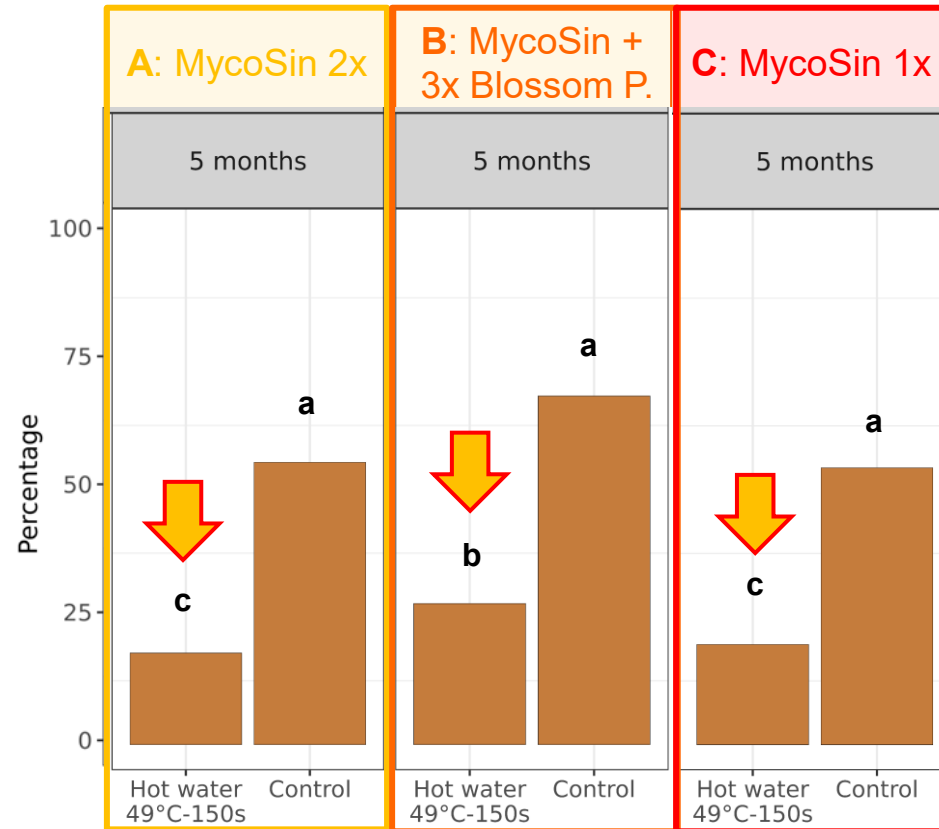
Rusticana
Harvest: 11.10.2026



Physiological disorders: Ladina → Scald



- Hot water treatment reduced scald.

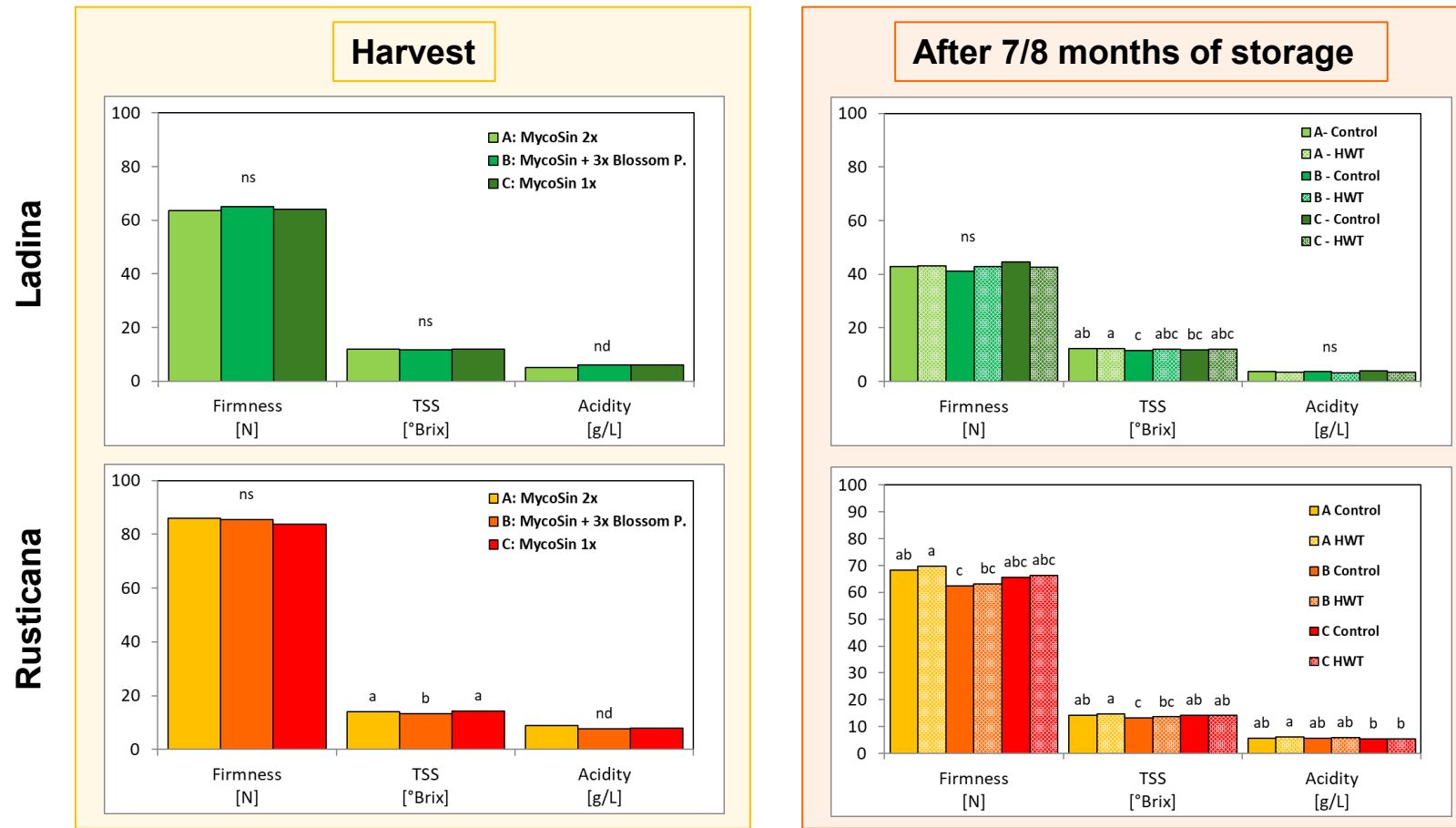


- Rusticana: no problems / no heat-related injuries observed in hot water treated apples



Fruit quality at harvest and after storage

- Minimal effect of preharvest strategies, mainly after storage.
- No effect of hot water treatment.





Conclusion

Cultivars

'Ladina'



'Rusticana'



Scab resistant but **highly susceptible to bull's eye rot**

Preharvest strategies



Myco-Sin® can reduce postharvest rots; however, its effectiveness is strongly influenced by rainfall.
Blossom Protect®: no impact observed.

Postharvest strategies



HWT effectively reduced bull's eye rot development across all preharvest strategies.

Storage



HWT reduced scald incidence in 'Ladina' and did not negatively impact fruit quality

Acknowledgments

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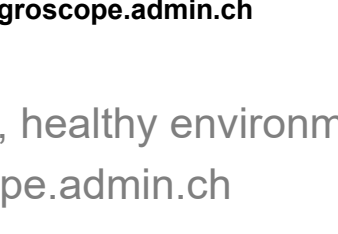
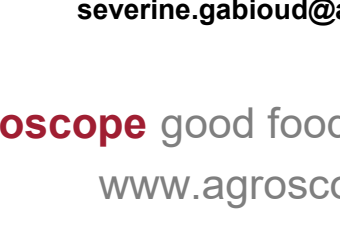
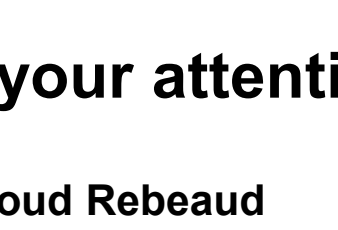
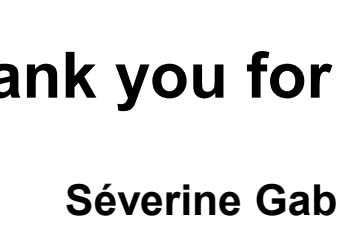
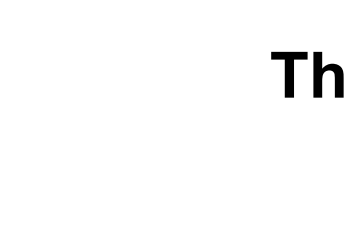
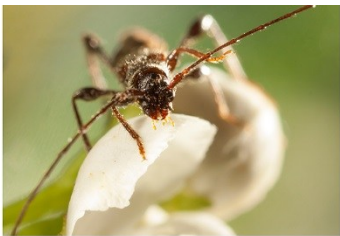
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FiBL Frick and team

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Thank you for your attention

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