

Preharvest application of 1-MCP on 'Rojo Brillante' persimmon fruit treated with ethephon

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Introduction

In persimmon, ethephon application is commonly used to advance the harvest time in order to extend the commercial period. Nevertheless, after this treatment, the fruit maturation is accelerated and the quality maintenance during storage is difficult. Persimmon are commonly submitted to a postharvest treatment with 1-methylcyclopropene (1-MCP) (Smartfresh®) before storage to maintain fruit firmness and quality. Recent studies have been shown that a preharvest application of 1-MCP (Harvista®) has a positive effect to delay fruit maturation and preserve fruit postharvest quality in some crops. However, there are a few studies on this treatment in persimmon. So, the objective of this study was to evaluate the effect of the preharvest application of 1-MCP on the quality of persimmon treated with ethephon.

Material and Methods

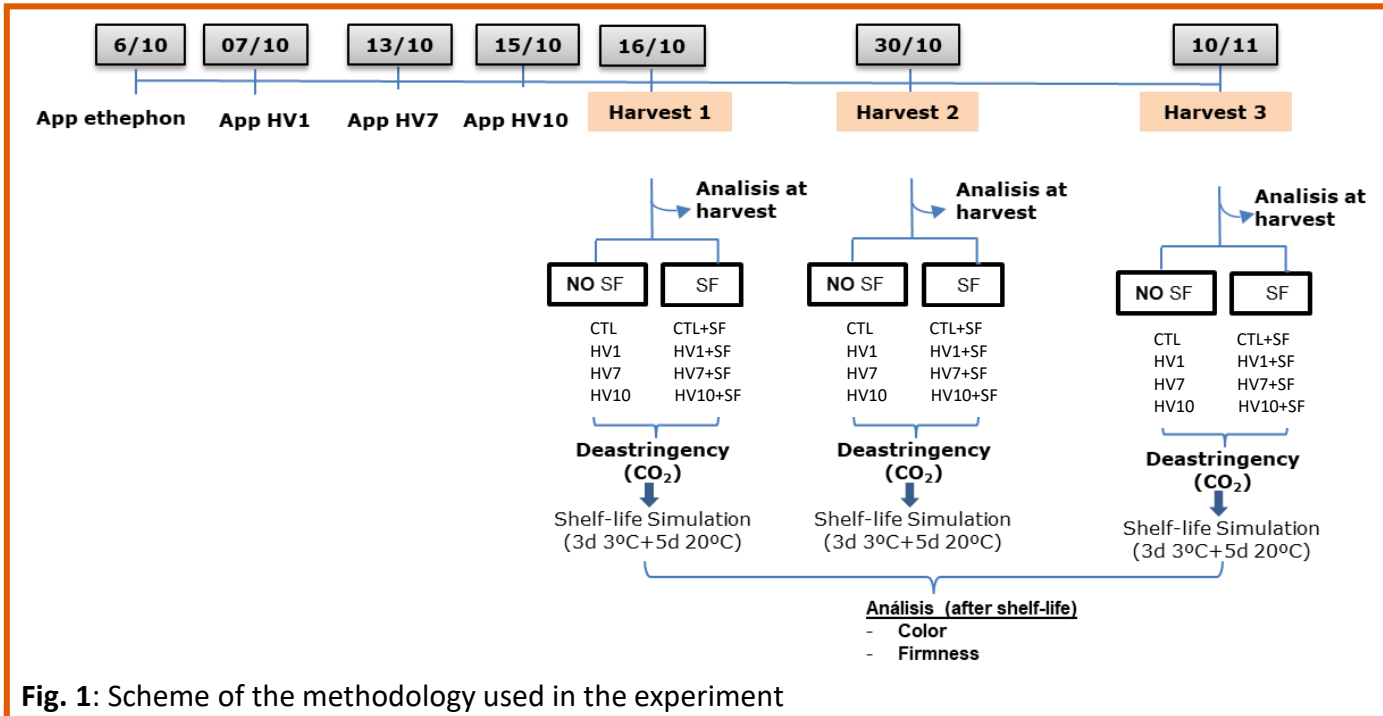


Fig. 1: Scheme of the methodology used in the experiment



Fig. 2: (A) Sample marking; (B) Preparation of the product in field; (C) Application of Harvista® on trees; (D) State of the fruit after the treatment.

Results

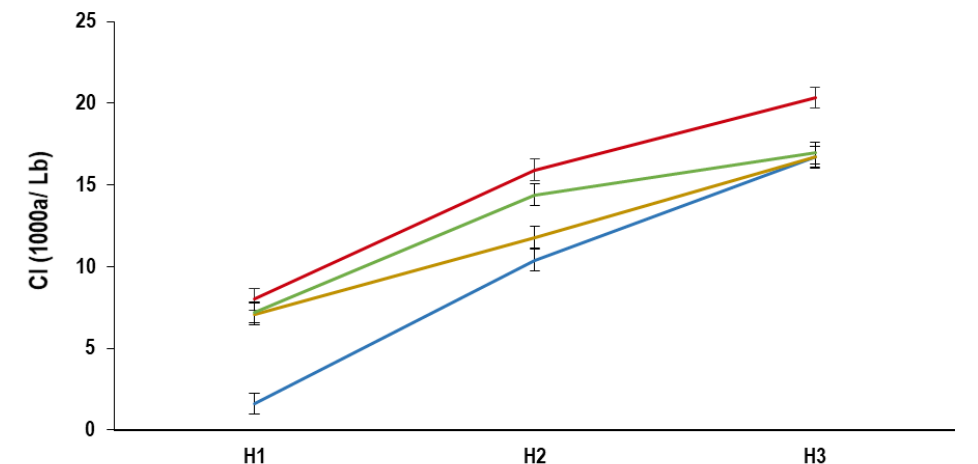
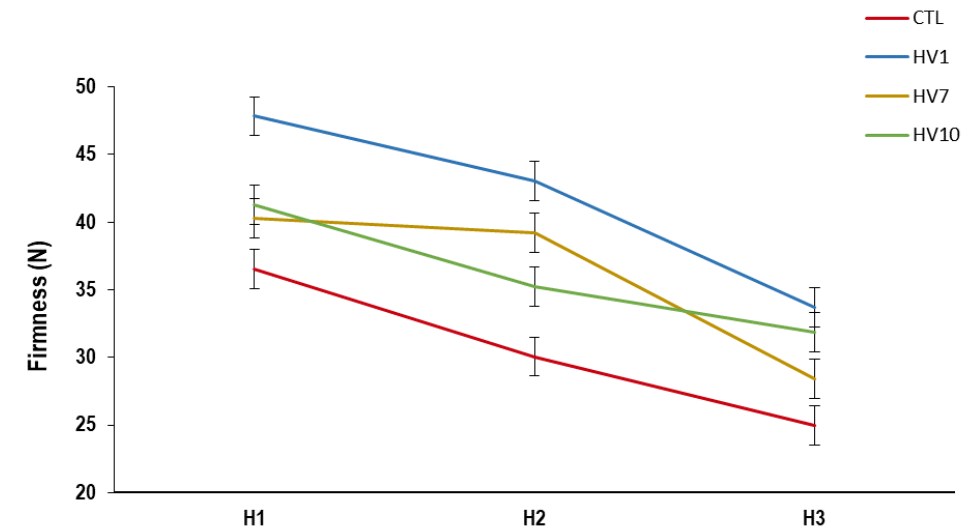


Fig. 3: Effect of the application of Harvista® after ethephon on the fruit quality at harvest.

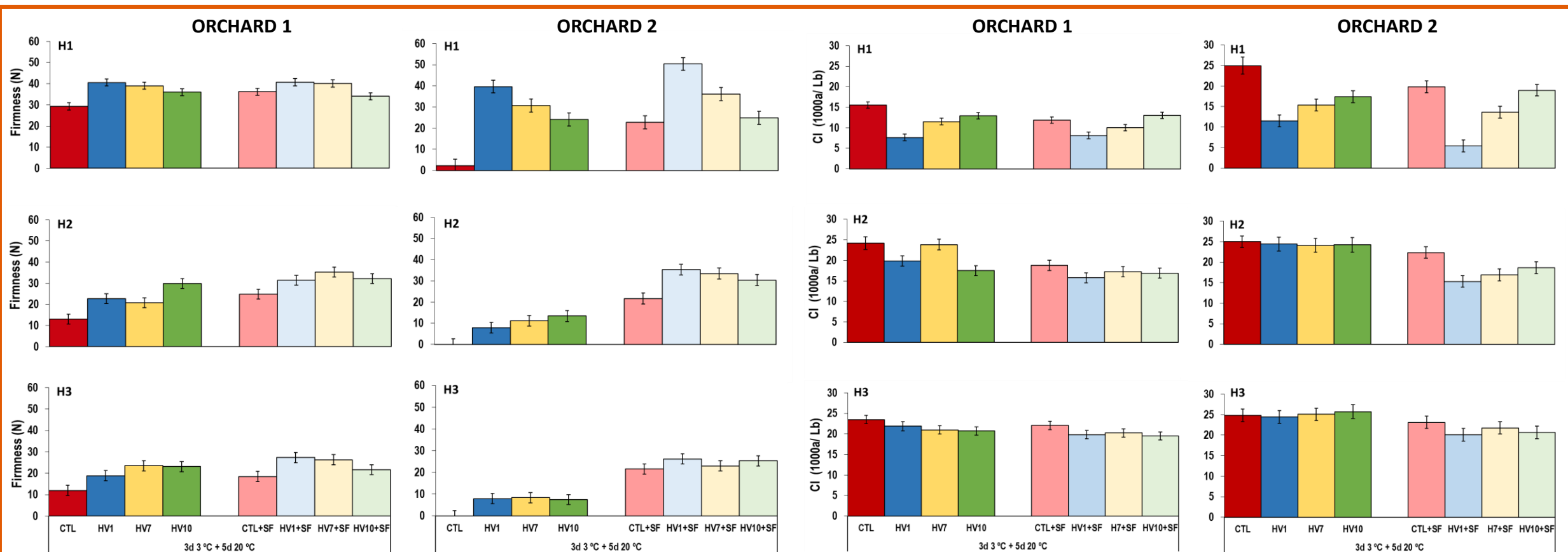


Fig. 4: Effect of the application of Harvista after Ethephon on the fruit quality after shelf-life simulation.

Discussion

1-MCP prevents some of the damage resulting from exogenous ethylene when the two compounds were applied in field in some crops (Blankenship and Dole, 2002).

In some crops, the combinations of pre- and postharvest 1-MCP was capable to optimize the fruit capacity to retain ripening, resulting in greater fruit firmness retention and longer ethylene suppression (Lee et al., 2019; Li et al. 2021)

Conclusions

- ✓ All Harvista® treatments delayed the ripening at harvest, retarding the flesh softening and the fruit color change. The highest effect was found when Harvista was applied one day after the ethephon application.
- ✓ During storage after harvests 1 and 2, the fruit treated with Harvista® showed higher firmness than control.
- ✓ In the fruit treated with both Harvista® (preharvest) and SmartFresh® (postharvest), the positive effect was observed in the harvests 2 and 3.
- ✓ The results obtained suggest that Harvista® could be a useful tool to maintaining the quality of persimmon treated with ethephon.

References

Blankenship, S. M., & Dole, J. M. (2003). 1-Methylcyclopropene: a review. *Postharvest biology and technology*, 28(1), 1-25.

Lee, J., Kang, I. K., Nock, J. F., & Watkins, C. B. (2019). Effects of preharvest and postharvest applications of 1-Methylcyclopropene on fruit quality and physiological disorders of 'Fuji' apples during storage at warm and cold Temperatures. *HortScience*, 54(8), 1375-1383.

Li, M., Zhi, H., & Dong, Y. (2021). The influence of pre-and postharvest 1-MCP application and oxygen regimes on textural properties, cell wall metabolism, and physiological disorders of late-harvest 'Bartlett' pears. *Postharvest Biology and Technology*, 173, 111429.