

PhD Thesis Defense

On **Friday February 28th 2025 at 9.00 am**, in the classroom **G**, Via Santa Sofia 100

Paolo La Spada (XXXVII cycle)

Will discuss his PhD theses titled

Fruit cracking susceptibility in table grapes (*Vitis vinifera* L.) and pomegranates (*Punica granatum* L.): microscopic, chemical and mechanical, investigations

Thesis Abstract

Fruit cracking is a physiological disorder that affects numerous agriculturally important species, significantly reducing both crop yield and marketability, and resulting in substantial losses during both the pre-harvest and post-harvest stages. Various factors, including environmental, genetic, morphological, physiological, and agronomic, contribute to a crop's susceptibility to cracking. These factors also affect the composition and morphology of the fruit's cuticle, the first barrier between the fruit and its external environment. Besides offering protection and structural resistance, the cuticle plays a crucial role in regulating gas exchange between the fruit and the environment. The objective of this doctoral thesis is to study the factors contributing to susceptibility to fruit cracking, with the aim of identifying traits that could enhance fruit tolerance to splitting. The research activities specifically focused on: (1) reviewing the literature on environmental and agronomic factors and their significant influence on fruit cracking; (2) examining how the cuticle of the table grape cv 'Italia' is influenced by different chemical compounds, with particular attention to cuticle thickness during development and ripening stages; (3) characterizing six table grape genotypes, including five newly developed hybrids, to identify traits that may confer tolerance to fruit cracking through chemical, mechanical, and microscopic analyses; (4) investigating the role of cuticular invaginations in pomegranates and how they may contribute to increased tolerance to fruit cracking. This doctoral thesis has provided scientific data contributing to a greater emphasis on the role of the cuticle in fruit cracking resistance. However, further studies are needed to more precisely understand how environmental factors (e.g., temperature and relative humidity) influence susceptibility to this physiological disorder.

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