

ABSTRACT

This study aimed to evaluate several methods for the management protection on quality determination of flesh translucency and fruit collapse disease on Indonesian MD2 pineapple. The research was carried out in Lampung fields of Sumatra island in Indonesia for 15 months, between September 2019 and August 2020. Three alternative methods to control translucency and two methods to control fruit collapse disease were discovered by the implementation of five experiments, addressing the optimal quality of the fruit. Concerning the flesh translucency, the first method consisted of pre-harvest fruit covers and foliar calcium fertilizations, the second was characterised by pre-harvest foliar calcium and silicon fertilization, and the third one using salicylic acid applications before and postharvest. Regarding the fruit collapse disease, the first method consisted of biopesticides applications like Bio P32 (based on *Pseudomonas fluorescens*) and Bio T10 (based on *Trichoderma harzianum*); meanwhile, the second method was described by pre-harvest foliar calcium and silicon fertilization. The first method to control translucency employed “white cover + change to yellow in four weeks before harvest + Ca from ten weeks until harvest” for the dry and rainy season. The second method delivered two results, for a rainy season with heavy rainfall and with a regular rainfall; those were described by “Si from six weeks before harvest until harvest” and “Ca from ten weeks before harvest until harvest”, respectively. Finally, the third method employed “salicylic acid (2 mM) before harvest (sprayed) + salicylic acid (7 mM) postharvest (dipping)”. In the case of the fruit collapse, the first method was described by the use of “Bio P32 + Bio T10 from 13 weeks before harvest”, while the second by the employment of “Ca + Si from 13 to 11 weeks before harvest/ from 6 weeks to harvest”. Each of the methods determined to control translucency and fruit collapse impacted the pineapple quality, primordially in terms of antioxidants, enzymes related activities and cell wall properties; also, the fruit mineral status, essentially associated with calcium, magnesium, and silicon. The ascorbic acid and β -carotene were beneficially impacted, reducing the action of reactive oxygen species and degrading enzymes, delivering more tolerance and resistance to fruit diseases. On top of that, minerals like potassium, calcium, and magnesium were enhanced, providing more consistence to the fruit constitution, minimizing the incidence of physiological disorders; and together with the antioxidants, generating a better fruit quality at harvest. As this is the first study of a vast magnitude in Indonesian plantations, more detailed experiments are recommended about the impact of each of these methods developed on thermotolerance, flesh translucency, fruit collapse and MD2 pineapple physico-chemical characteristics.

Keywords: Antioxidant, biopesticides, calcium, cell wall, covers, silicon, thermotolerance.