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Internal Pulp Browning, a new disorder of ripe mango (*Mangifera indica* L.) fruit

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Internal Pulp Browning (IPB) is a disorder observed in ripe mangoes var. TomEJC. The main symptom is browning of pulp tissue just outside the seed on both sides. The affected fruits show no external signs of the disorder. Exhaustive literature reviews revealed that the disorder has not previously been recorded. The aim of the study was to understand the factors involved in the development of IPB and develop meaningful management practices. In TomEJC, the seed starts germinating while within the fruit. Length, width and thickness were measured in seeds from fruits affected by IPB and also in germinated and ungerminated seeds from healthy fruits. Additionally, daily rainfall was recorded during four consecutive seasons during 2017-2019. Measurements on seed dimensions indicated that the seeds swell during germination increasing their thickness, twice as much as that of ungerminated seeds. There was no significant difference in seed thickness between germinated seeds from fruit with or without IPB symptoms. However, in every fruit that showed IPB symptoms, the seed had germinated invariably while within the fruit and had increased its thickness. The mean length and width were not significantly different (P > 0.05) among the seed that had not germinated within the fruit, germinated but no IPB or germinated showing IPB symptoms. Incidence of IPB was only observed in the year-end season where monthly average rainfall was high. Percentage fruit with germinating seeds was determined at two harvesting maturity stages, 13 and 14 weeks after anthesis, and % incidence of IPB was also compared. The fruits harvested 14 weeks after anthesis showed 100% seed germination while it was 15% in fruits harvested after 13 weeks showing a positive relationship between seed germination and development of IPB. The seed expands in thickness during germination exerting pressure on the pulp tissue adjacent to the seed surface which could result in damage to the tissues and resin canals. Phenolic compounds released from damaged resin canals may undergo oxidation forming polyphenols and causing tissue browning. In conclusion, in-fruit seed germination and rainfall appear to be the main factors contributing IPB development. Harvesting fruits 13 weeks after anthesis reduced in-fruit seed germination and the incidence of IPB.

Keywords: fruit disorder, in-fruit germination, mango (*Mangifera indica*)

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20