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"Development on the margin"

Application of Plant Growth Regulators During Premature Fruit Drop of Mango for Identifying the Key Physiological Factor

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Abstract

In the mountainous area of North Vietnam mango (*Mangifera indica*) production is an important source of income for farmers, especially since the initial fruit growth period occurs during the dry season whereas other crops have not yet initiated (maize) or are just about to commence (rice) the growth and development cycle, hence are more dependent on rainfalls. The development of mango fruit partly during the dry season causes premature fruit drop, which may result in severe crop losses. Irrigation systems are difficult to establish in the study area because of limited water resources and costly investments for the famers. Fruit drop prevention by the use of plant growth regulators was tested as a possible alternative. Among others, CPPU spray applications showed that fruit retention can be increased up to 8-fold compared to the control treatment. However, for a better understanding of the underlying physiological mechanisms of fruit drop, Ethephon, a fruit drop inducer, was compared to CPPU in subsequent experiments. Color, size and weight of fruit as well as the fruit detachment force (FDF) were measured at timely intervals after spray application of each individually sampled fruit. Color was measured with a spectrophotometrically and hue angle (H°) was calculated for the fruit beak and shoulder. Results indicate that fruit with a high H° on either fruit position had a reduced FDF with colour changes occurring first at the fruit beak. Fruit parameters were further used to discriminate between fruit as visually healthy and about-to-abscise. About 70 % of the variation in FDF of visually healthy fruit was explained by fruit length and pedicel diameter. Fruit that were visually healthy but showed a reduced FDF may be explained by internal physiological factors which are related to the onset of the abscission process. Therefore fruit carbohydrate concentration and auxin transport capacity of the pedicel are currently analysed and will be presented at the conference. The results from those physiological parameters may help to identify the health status of fruit beyond their visual external appearance.

Keywords: Auxin, carbohydrate, CPPU, Ethephon, fruit pysiology, *Mangifera indica*, mango, plant growth regulator

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