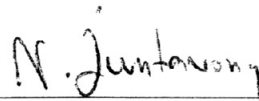


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Ethylene is effectively used to accelerate ripening which results to the reduction of harvesting time. Different concentrations and application times of the use of ethephon were reported. It was found that high concentration of ethephon, known as an ethylene releasing agent, and the application at an early stage of fruit development reduced size, weight and sugar content but increased titratable acid (TA). Treating with the low concentration of ethephon, sugar content increased with unchanged TA. This thesis aims to optimize the concentration and application time of ethephon in order to increase fruit quality and to hasten harvesting time. The effect of ethephon on sucrose synthase (SuSy) activity was also carried out. The field experiment was split plot in randomized complete block design. In a main plot, two concentrations of 48% w/v ethephon at 0 and 500 mg/l were used and sprayed with 50 ml volume per fruit at the age of 96, 110, 124 and 138 day-after-forcing (DAF). In a sub plot, harvesting time was 1-2 weeks interval from 110 to 152 DAF. It was found that after treated fruits with 500 mg/l of ethephon at 110, 124 and 138 DAF, harvesting time was one week earlier than untreated fruits that of 152 DAF. Moreover, fruit quality was increased without the change of size and weight of fruit and crown. The data also showed that the total soluble solids (TSS) contents of 145 DAF harvested fruits were higher if treated at 110 DAF, whereas the TA content of 145 DAF harvested fruits was higher if treated at 138 DAF. In addition, the increase of TSS contents positively related to the increase of sucrose and the TA content. The SuSy activity did not relate to the increase of sucrose accumulation in pineapple fruit and it was reduced by ethephon. The partial sucrose synthase cDNA of pineapple flesh was sequenced and cloned into pGEM<sup>®</sup>-T to be the pAcSuSy for further study of a full-length sucrose synthase gene. In conclusion, high fruit quality with shortening harvesting time has been improved by applying 500 mg/l ethephon at 138 DAF since high TA content has been reported to increase the canning quality of pineapple in Thailand.



Student's signature



Thesis Advisor's signature

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