

Siriluk Onnom 2007: Effects of Plastic Roof on Leaf Gas Exchange and Fruit Set, Quality and Diseases of Mango cv. Nam Dok Mai. Master of Science (Economic Botany), Major Field: Economic Botany, Division of Science. Thesis Advisor: Associate Professor Kanapol Jutamanee, D.Agr. 111 pages.

The problem of off-season production mango is low yield and poor quality. Rain and high humidity during flowering period cause few fruit set and induce the severity for anthracnose. The objective of this experiment is to study the effect of transparent PVC plastic roof on reducing splashing force of rains and decrease humidity which cause damages and spreads of *Collectotrichum gloeosporioides*. Comparisons of change in climate and soil water condition, leaf gas exchange, non-structural carbohydrate contents and fruit set under plastic roof and natural condition were examined.

Plastic roof could reduce photosynthetic photon flux(PPF) by 29%. Both day and night temperature, relative humidity, vapor pressure deficit and leaf wetness not different. Plastic roof could not protect the throw of rain water inside of mango trees. Plastic roof made drier soil water condition than uncovering and it could not increase net photosynthesis rate(A) in blooming period, fruit's age at 2<sup>th</sup> and 5<sup>th</sup> week. Due to the mango's leaf has the low stomatal conductance(g<sub>s</sub>) and low transpiration rate(E), both g<sub>s</sub> and E value made low photosynthesis rate. In contrast, fruit's age at 13<sup>th</sup> weeks, the plastic roof could increase A because it reduced photosynthetic photon flux and caused higher g<sub>s</sub> and E than uncovering. Furthermore, mango tree without plastic roof showed lower  $\Phi_{dark}$  because it received high photosynthetic photon flux(PPF) which destroyed reaction center of PSII. The non-structural carbohydrate contents(TNC) in both two treatments were not different. Plastic roof could not increase fruit set but increased fruit quality. It gave lighter color peel at ripening time (L = 68.08). However, it could not increase fresh weight, size and total soluble solid(TSS) in fruit. Plastic roof reduced anthracnose at pre-harvest period by 26.1%, post-harvest by 11% and decreased severity level of fruit rot at ripening stage. Furthermore, completely control of thrip damage on the fruit surface was observe by this method.



Student's signature

 22 / 05 / 2007

Thesis Advisor's signature