

Sukchom Na nakorn 2011: Study of Water Transport to Tomato Fruit.
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Professor Suntaree Yingjajaval, Ph.D. 75 pages.

Movement of water into and out of tomato fruit was studied. The diurnal inflow (sap flow), the outflow (transpiration) and the change in fruit diameter were followed on two days. Three set of fruit aging 14, 21 and 28 days were measured concurrently, then followed by another three set of fruits aging 35, 42 and 49 days.

Both days showed similar environmental conditions, having strong sun with maximum air vapor pressure of 3.0-3.4 kPa. Young fruit of 14-21 days old showed higher rate of water inflow during night time, after which the higher inflow rate occurred during daytime. At the age of 35 days (beginning of ripening as pink color appeared), the inflow reached the maximum accounting for 12.8% of the initial fruit mass. At the end of 49 days, the inflow reduced to 1.3%. Fruit transpiration was dictated by the fruit to air vapor pressure deficit as the cuticular conductance remained fairly constant. Young fruit (age 14-21 days) had higher transpiration rate due predominantly to the much higher level of cuticular conductance. The outflow was in the range of 16-18% of initial fruit mass and reduced to a stable 6% at older age. The shrinkage of fruit took place during 8-15 h., and having expansion during the rest of the time. The largest change in diameter, namely the largest increase in fruit water content occurred in 14 day-old tomato amounting to 6.2% of initial fruit mass. Ripening fruit aging 42-49 days had a net loss of water over one day period. Summarily, the tomato fruit expanded continuously and reached the maximum in size at the age of 35 days indicating a higher amount of water inflow than the outflow and the reverse was true at the older stage of fruit development, fruit took place during 8-15 h., and having expansion during the rest of the time. The largest change in diameter, namely the largest increase in fruit water content occurred in 14 day-old tomato amounting to 6.2% of initial fruit mass. Ripening fruit aging 42-49 days had a net loss of water over one day period. Summarily, the tomato fruit expanded continuously and reached the maximum in size at the age of 35 days indicating a higher amount of water inflow than the outflow and the reverse was true at the older stage of fruit development.

Student's signature

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