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Performance of modified leader form and long primary scaffold and low tree height (LS-LTH) form in 'Fuyu' persimmon (*Diospyros kaki* L.)

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Modified leader form trees can not perform photosynthesis and consequently died due to apical dominance which trees development into reversed triangular type and low branches do not attain enough light energy as the trees age getting old. Otherwise, long primary scaffold and low tree height (LS-LTH) form has triangular type and advantage that low branches have enough light energy and due to the low tree height through bending, more canopy area, and making the first branch longer. Further advantage is that we can harvest fruits in the low height within 50 cm from the soil.

The Canopy area of LS-LTH form was wider than that of modified leader form, especially the canopy area of 20-year old trees was more than 5 m^2.

Light energy transmission rate of LS-LTH form in the middle of canopy was 160 μmol · m^{-2} · s^{-1} which was the about 10% of total light energy, and that of low canopy was 30 μmol · m^{-2} · s^{-1} which is about 2.4% of total light energy. The photosynthetic rate of the leaf within the canopy was higher than that of outside of the canopy regardless of light intensity. Light compensation point of leaves outside of canopy was about 40 μmol · m^{-2} · s^{-1} and that of within the canopy was about 20 μmol · m^{-2} · s^{-1}. Light saturation point was about 1,500 μmol · m^{-2} · s^{-1} regardless of the height of canopy.

In the comparison of fruit harvest after pruning the 13-year old tree as LS-LTH and modified leader form, respectively, LS-LTH form had more fruits than that of modified leader form in the third year. Total number and weight of fruits per tree was increased to 160% when pruned as LS-LTH form.

Key words : Canopy, canopy area, light penetration, photosynthesis, fruit yield