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Photosynthesis and Productive Structure of Mature Tea (Camellia sinensis L.) Bush during Growth of the First Flush

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Abstract:

Photosynthesis and canopy structure of a mechanically-plucked tea bush were investigated in spring to clarify the role of overwintering leaves in growth of first flush shoots. After bud break, light interception by the overwintering leaves on the autumn skiffing surface declined gradually due to shading by elongating new shoots, and leaves began to show the features of shade-leaves. Photosynthetic activity of immature leaves on the first flush shoots increased sharply after sprouting and reached the same level as overwintering leaves at the plucking stage. Measurement of $^{13}CO_2$ fixation by the tea bush showed that at the plucking stage, nearly 90% of canopy photosynthesis was conducted by developing new leaves and contribution of overwintering leaves was only 10%. The results indicate that although canopy photosynthesis is entirely carried out by overwintering leaves at the bud break stage, their contribution decreases gradually with the growth of first flush shoots, and at the plucking stage, most canopy photosynthesis is carried out by developing new shoots. Thus, growth of the first flush of mature tea bush would depend not only on reserve carbohydrates and photosynthesis by the overwintering leaves, but also on photosynthesis by growing new shoots themselves.

Keywords:

Canopy photosynthesis, ^<13>CO_2 fixation, First flush shoots, Light interception, Overwintering leaves, Reserve carbohydrates, Stratified clip method, Tea

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