

乾旱逆境對茶樹生育及葉片微細構造變化之研究

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摘 要

四年生鉢植茶樹每日灌溉 200 毫升，土壤水分保持在田間持水量狀態及灌溉 20 毫升，使土壤逐步缺水，試驗結果如下：

茶樹生長在田間持水量情況下，對口芽所佔比率較低，且大多在茶芽長至一心五葉時始陸續形成；而缺水植株生長至一心三葉或四葉就形成對口，色澤黃綠，內折度大及節間短。茶芽生長模式經卡方顯著性測驗，春季不論灌溉與否，符合二次式指數生長曲線；冬季不論灌溉與否皆以二次式迴歸方程較符合其生長曲線。

葉片橫切面構造方面，第一層柵狀細胞長度以春季缺水處理 52.6(m 最長、冬季缺水處理 46.3(m 次之，其他處理介於 40.5(m ②) (m 之間，差異不顯著；第三層柵狀細胞平均長度介於 23.1(m ④) (m 之間，以夏季缺水處理 23.1(m 最短。海綿細胞大小以春季灌溉處理長度 23.4(m、寬度 19.1(m 最大，夏季缺水處理長度 20.2(m、寬度 16.5(m 最小。

Studies of the Drought Stress on the Growth and Leaf Structure of Tea Plant

Taiwan Tea Experiment Station

Summary

Four-year old tea plants grew in 1/20 m² Wagner Pots. One set of Pots was irrigated 200 ml of water /pot every day to maintain soil moisture content at the field capacity condition . Another set was irrigated 20 ml of water /pot every day to limit the water supply gradually. Results obtained are summarized as follows:

Tea plants generally grew to have five leaves and one bud per shoot and the percentage of banjhi shoots was low at the field capacity condition. The growth of water stressed tea plants was slow with only three to four leaves and one bud per shoot and the percentage of banjhi shoots was high. Water stress also caused tea leaves yellow green, large of leaf interpose and shorter internode. The growth models of tea shoots were analyzed according to the data of shoot length during the treatment period of 30 days and tested by Chi-square .The shoot growth well fitted the quadratic exponential growth equation for both irrigation and limited irrigation treatment in the spring . Quadratic regression equation was suitable for both irrigation and limited irrigation treatments.

Cell size of leaf in cross section: The length of 1st layer palisade cells 52.6(m under water stress treatment in the spring ,the longest among all treatments . The next was 46.3(m under water stress in the winter. Other treatments were between 40.5(21) (m , and were not significantly different. The average length of 3rd layer was between 23.1(14)(m in which the shortest (23.1(m) was found under water treatment in the summer. The size of spongy cells was 23.4 (m in length and 19.1(m in width under irrigation in the spring ,the largest among all treatment in the summer which was 20.2 (m in length and 16.5(m in width.