The Shoot Growth Pattern of Tea *(Camellia Sinensis)* During Different Stages of the Pruning Cycle

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Introduction

Tea *(Camellia sinensis)* is a woody ever green perennial tree. Different tea cultivar has different growth characteristics. The shoot replacement cycle is a measure of the time taken (days) for an axillary bud to grow into a shoot suitable for harvesting when released from apical dominance (Carr, 2000). There are three principal yield components in tea, namely the number of shoots harvested (per m^2), the mean shoot dry mass at harvest (g) and the time taken for an axillary bud to grow into a shoot suitable for harvesting (Carr, 2000). Tea shoot growth varies with the clone, the season, inputs such as nitrogen (N), and stage in the pruning cycle.

According to the hand book on tea the removal of leaf bearing branches in a tea bush at a given height is called pruning. This may also affect the pattern of shoot growth too. Investigating shoot growth pattern and factors affecting are very help full to determine the suitable plucking policies (Wijeratne, 2001) and it may also help to decide the other management practices to maximize the yield.

Methodology

A field experiment was conducted at the St Coombs Estate of the Tea Research Institute of Sri Lanka, Talawakelle. Different stages of the pruning cycle of the tea cultivars of TRI2025 and DT1 are maintained at closer proximity. After removing apical dominance, randomly selected shoots were tagged in order to monitor their growth. The shoot length measurements were taken time to time until they reach the pluckable stage.

Along with Number of shoots per unit area, Individual shoot weight, Number of active and banji shoots per unit area and weekly yield data on dry weight basis were also collected using the same set of harvested shoots to minimize any possible differences on the shoot growth pattern by harvesting.

Results and discussion

According to the results obtained, differences were observed in the shoot extension rate which had been measured as the average time taken for an axillary bud to become pluckable stage, both in the different years of the pruning cycle as well as between the two different cultivars tested. When the tea shoot growth in different stages of the pruning cycle is concerned, significantly higher shoot extension rate was observed in the tea plants of 1st year after pruning in both cultivars tested. The lowest shoot extension rate was observed in the tea plants of the 5th and 4th years after pruning stage When considering the two

cultivars, shoot extension rate of the DT1 was significantly higher than that of TRI2025 ($p=0.0105$). Average time taken by the bud to become pluckable stage was 43.15 and 42.25 days for DT1 and TRI2025 respectively. According to the Duncan's multiple range test results, the total number of shoots was significantly higher in DT1 than the TRI2025 and individual shoot weight was significantly different between the two cultivars tested. The individual shoot weight was higher in the TRI2025 than the DT1 ($p<0.0001$).

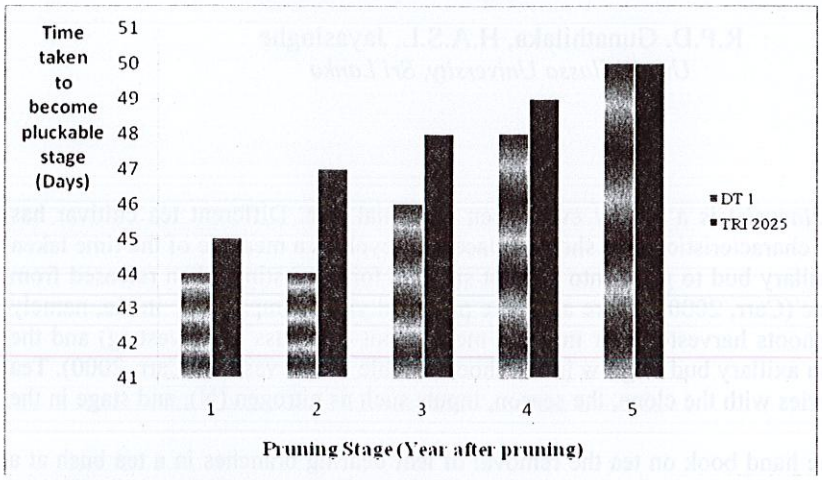

Figure1: Comparison of shoot extension rate of tea

The average yield of cultivar DT1 is significantly higher than that of cultivar TRI2025 ($p<0.0001$) (Fig.1). The main reason behind this variation could be the differences of the number of shoots per unit area and the shoot extension rate in different clones

Table 1: Average yield of the respective pruning stages (DT1 and TRI2025)

Pruning stage	Average yield (g/m^2)
1	124.133 a
2	117.527 ba
3	115.064 ba
4	112.190 b
5	111.414 b

The average yield in terms of dry weight per unit area for both cultivars were significantly different among the different stages of the pruning cycle ($p<0.0001$) (Table 1). The highest

average yield was observed in the 1st year after pruning followed by the 2nd and 3rd years after pruning and the lowest was observed in the 4th and 5th years after pruning stage.

Conclusion

The shoot extension rate in DT1 was higher than TRI2025 and the shoot growth during the 1st year after pruning is the highest and it is the lowest in the 5th year after pruning. Yield also follows the similar pattern of variation. Yield of DT1 was higher than TRI 2025 during experimental period and also the average yield (g/m^2) of the 1st year after pruning are higher than the other. It is lowest in 5th year after pruning both two cultivars. The differential shoot growth pattern in tea plants of different years after pruning has an effect on the variability in yields observed in a pruning cycle.

References

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