

Abstract

The effects of polyploidy on yield, total dry-matter production and partitioning of tea were studied in diploid (2n), triploid (3n) and tetraploid (4n) tea (*Camellia sinensis*). Although increased ploidy depressed yield significantly ($P < 0.05$), significant differences in productivity were noted among genotypes of the same ploidy level and some triploids even outyielded some diploids which indicated the potential for selecting and/or developing high yielding polyploid clones. After 60 months of growth, the clones had accumulated 20 ± 53 tonnes of dry matter per hectare. Diploids accumulated significantly higher total biomass than the polyploids. Between 25 and 40% of total accumulated dry matter was partitioned into leaves. Polyploids had a large proportion of unplucked leaves which indicated that their productivity could be improved by plucking older leaves with the bud (coarse plucking) or by more frequent plucking. Between 13 and 32% of the total dry matter was partitioned into the root system. The high yielding clones accumulated among the least dry matter in their root systems. Rooting depths were significantly different within the ploidy groups although there were no significant ploidy effects on this trait. The clonal harvest index (H.I.) ranged from $8.9 \pm 26\%$, with the high yielding clones having values in the upper limits and low yielding ones in the lower limits of this range. The woody tissue in the frame formed the largest proportion of the total dry matter i.e. between 40 and 52%. Diploids accumulated significantly more dry matter in the frame compared with polyploids. Phenotypic correlation coefficients indicated that the total leaf biomass was the best indicator for productivity in tea.