

STUDIES ON ROOTING PATTERN AND CROP PRODUCTION IN TEA
(Camellia sinensis) AND CLOVE (Eugenia caryophyllus)
MIXED SYSTEMS

By

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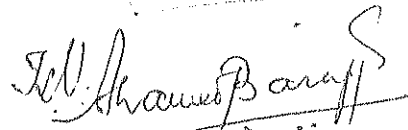

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ABSTRACT

A study was undertaken to gather information on the rooting pattern, soil moisture status, available soil phosphorus and organic matter addition in the mixed and mono crop stands of tea and clove. About one hundred year old seedling tea, mixed planted with clove at the State Plantation Estate, Hunnasingiriya, was made use of for recording the observations, along with tea and clove in mono stands which were also available at the same estate.

Tea under mono cropping had over 60% of total roots in the first 30 cm soil layer while clove had about 50%. Out of the feeder roots tea had 75.7% in this top soil layer, while clove had 49.5%. Data on total number of branches in both crops in mono stand showed that when tea had 56% in the top layer clove had about 50%. In the same layer of soil, the number of feeder roots of tea was almost 80% while that of clove was only 56%. A more or less a similar pattern of distribution was seen in the length of roots also. A concentration of root activity in the top 30 cm soil depth was thus apparent in both the crops. In the mixed crop, clove had an increase in weight of roots from 50% to 67%, an increase in number of roots

from 56% to 72% and an increase in length from 50% to 60% in the first 30 cm soil depth. A similar increase was also observed in the case of the feeder roots of clove. A clear shift in the rooting pattern of clove from lower layers to the top was observed under mixed cropping. Clove under mixed crop also showed an increase of 19.4% in total fresh weight, 57.0% in number of branches and feeder roots and 7.0% in total length. Tea on the other hand, showed only 12.7% increase in total fresh weight.

The available phosphorus in the top 30 cm soil under mono crop of tea and mixed crop of tea and clove was over 600 ppm while it was less than 160 ppm in the mono crop of clove and bare land. The organic matter addition through leaf fall was 1,210.8 kg/ha in the case of mono crop of tea and 899.4 kg/ha in the case of tea and clove mixed crop while it was only 555.8 kg in the case of mono crop of clove.

Moisture in the first 30 cm soil depth during the peak drought was roughly 18% for mono crops of tea and clove while it was about 29% in the mixed stand. The moisture in the subsequent depths was also high in the mixed stand than in the mono stand. Thus, compared to mono crops of both tea and clove there was a higher percentage available moisture in the mixed stand of

these two crops at all three depths.

The various physical and biochemical factors that would have contributed for the favourable moisture, nutrient and other factors in the soil under the mixed cropping situation have been discussed. Though this study has been of a preliminary nature, undertaken under the prevailing field conditions, the data gathered go to show that tea and clove as a mixed crop combination has definite advantages from various aspects of crop production.

