

PHYSIOLOGICAL INVESTIGATIONS ON COCONUT BASED CROPPING SYSTEMS

Dr. V Rajagopal
 Central Plantation Crops Research Institute
 Kasaragod-670 124, Kerala, India

Effective utilization of land, airspace and inputs with maximum returns are the main objective of any cropping systems. In a cropping system even though all other conditions are favourable for the growth of the intercrops, light is the only limiting factor since light penetration of a plant stand is reduced through interception and absorption by the taller canopy. Hence the main objective of the study was to understand the growth and dry matter production of component crops under a coconut based high density multi-species cropping system (HDMSCS) i.e. a closed system as compared to the monocrop i.e. the open system, to find out the compatible crops under the cropping system.

The light intensity (PAR) in the open on a clear day ranged from 10 to 15 $\mu\text{mol m}^{-2} \text{S}^{-1}$ at 07.00 h and 18.00 h. with a peak at 12.00 h (1800 $\mu\text{mol m}^{-2} \text{S}^{-1}$). Below the coconut canopy of 18 year old palms the incident PAR is only 40-50% of the open. This means that the coconut canopy intercepts 50% of the light. At any time of the day the incident PAR received by the crops at the ground level is only 3.8% to 4.5% of the open. The growth and dry matter production of the intercrops in relation to this light intensity have been investigated. The results indicated although the yield potential could not be fully realised in the crop plants under the shaded conditions as much as that under the open system, the reduced yield showed their adaptability to low light profiles.

The partitioning of dry matter also was found to be more towards the short growth than towards the economic produce under the closed system. Since all other conditions are optimum for the growth of the intercrops, the reduction in the growth and dry matter production under the system can be attributed to the lower light intensity incident on the intercrops.

Even though the system gave an additional income from the increased coconut yield as well as from the yield of intercrops, the investigations reveal that identification of suitable crop species which can adopt and give a better yield under low light intensities is highly desirable while establishing such cropping system models. Thus, the studies on light utilization efficiency assume paramount importance in cropping systems with divergent species.

.....