

## Balance of the Solar Radiation in Agroforestry Systems in Central Amazonia.

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Micrometeorological observations have been used to study the radiation balance over recultivation areas of the SHIFT Project in the Central Amazon, during the dry season. The site was first cleared of primary forest to make way for an experimental rubber plantation which was abandoned soon after. Later, the secondary forest which had evolved was cleared and burnt to establish the plantation systems. The radiation balance was compared with measurements obtained in a adjacent forest (Ducke Reserve). The performance of 5 methods for estimating the long-wave atmospheric radiation flux ( $L\downarrow$ ) were analyzed. However, the estimates from these formulations underestimate  $L\downarrow$  values, when compared to the measurements. Using local coefficients, the estimate of  $L\downarrow$  from the equation proposed by Swinbank (1963) showed better results, followed. In addition, the discrimination among the 5 models

considered, using the Box and Hill algorithm, showed best adjust with the Idso and Jackson formulation, than the estimate obtained from the formulations proposed by Swinbank, Satterlund, Brutsaert and Brunt. Mean daily albedo of the recultivation area was 14%, agreeing well with other tropical forest measurements. The difference in the daily pattern of incoming solar radiation ( $K\downarrow$ ) between the sites was found to be 7% higher at the recultivation area. Approximately 55% of  $K\downarrow$  reaches the surface, while this value was much less at forest (10%). The net radiation measurements on the basis of  $K\downarrow$ , showed excellent accuracy. In contrast, the albedo estimated in terms of the sun's elevation angle must be considered with caution. Therefore, the variability in micrometeorological variables results from changes in land use and vegetation cover in tropical forest areas.

## Influence of Solar Radiation on Offshoot Number and Production of Peach Palm (*Bactris gasipaes*) in Agroforestry Systems in Central Amazonia

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The peach palm (*Bactris gasipaes* H.B.K.) has aroused the interest of farmers due to being a native of the region, its precocity and shoot production, and because of the reduction in the offer of palm hearts from natural reserves, resulting in a high demand and price. Agroforestry systems (AFS) have shown indications of being a promising alternative for cultivation in agricultural lands, mainly in degraded areas of Amazonia. Therefore, the species implemented in AFS in those areas seems to bring good results. The experimental design is carried out in four random blocks with three treatments corresponding to: a) AFS 1 – polyculture involving rubber tree (*Hevea brasiliensis*), peach palm (*Bactris gasipaes*) for heart palm production, cupuaçu (*Theobroma grandiflorum*) and papaya (*Carica papaya*); b) AFS 2 – polyculture with peach palm, cupuaçu,

Brazil nut (*Bertholletia excelsa*), urucum (*Bixa orellana*) and cassava (*Manihot esculenta*). The soil of the agroforestry systems is covered by kudzu tropical (*Pueraria phaseoloides*). For comparison, the peach palm monoculture was included in the experiment. Each plot is comprised of 12 plants in one cultivated line chosen at random. AFS plants are adults and continue receiving pertinent cultivating treatments (fertilization, weeding) to avoid growth limitations. It has been under evaluation the production, growth rate, dry mass and LAI in peach palms. However, the growth rate of neighboring plants has also been recorded. The aim of this work is to obtain data on the effect of sun radiation on peach palms in AFS and monoculture.