Impacts of canopy cover on soil termite assemblages in an agrisilvicultural system in southern Cameroon

Abstract

Termites were sampled using randomized soil pits in 64 cropping plots, each 25 x 25 m, forming an experimental agrisilvicultural system in both a 6- and an 18-year-old Terminalia ivorensis plantation, in which canopy cover, crop, cropping system and land preparation were the principal treatment variables. The treatments were established in April 1995 and sampling was carried out in November 1995, February 1996 and July 1996. A total of 82 termite species were found, of which 67 were soil-feeders. Overall termite abundance and the abundance of soil-feeders increased between November 1995 and July 1996, reaching a mean of nearly 6000 m(-2). Pooling termite data from these sampling dates, in the old plantation, the high canopy cover treatment (192 stems ha(-1)) had a greater abundance of termites, compared with the low canopy cover treatment (64 stems ha(-1)) and this effect was independent of crop type (plantain or cocoyam), cropping system (single stands or mixed crops) and land preparation (mulch retained or burned, plantain only). The young tree plantation (same tree densities as in the old plantation) showed no significant difference in termite abundance between high and low canopy (levels of tree foliage) densities, though the high canopy sheltered a greater number of termites. Analysis of covariance showed that crop yield (both plantain and cocoyam) was not directly linked to the abundance of all termite populations, but that the cocoyam yield was positively correlated with the abundance of soil-feeding termites (the majority in the assemblage) in the young plantation. This may be due to the beneficial conditioning of soil resulting from the foraging and construction activities of soil-feeders.