

Simply Obtained Global Radiation, Soil Temperature and Soil Moisture in an Alley Cropping System in Semi-Arid Kenya

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Abstract:

Global radiation, soil temperature and soil moisture data were obtained from a 4–6 year old *Cassia siamea*/maize (CM) alley cropping (or hedgerow intercropping) system, at a semi-arid site at Machakos, Kenya, in the late eighties. With the growing need to explore and manage variations in agro-ecosystems these results deserve new attention. They quantify, in a simple but detailed manner, the influence of hedgerows on the microclimate of their intercrop and for comparison provide a sole maize (SM) control. Due to inhomogeneity of *Cassia* and maize, as well as limited budgets, the sampling methodology and the choice of appropriate equipment, including the sensors, demanded special attention. The diurnal patterns of soil temperatures at 7.5 cm depth represented well the shading patterns of the hedgerows. This can be developed into an operational auxiliary methodology of integrated shade quantification. With proper precautions, the developed sampling methodologies showed appropriately the time integrated values of the three microclimatic parameters with enough detail to understand yield differences between treatments and between rows. This approach may therefore be recommended for on-farm quantification of even greater spatial variability of parameters. The limitations of the selected methods are highlighted. Experiences with some alternative methods are also discussed.