46. Adapting pest management practices in sub-Saharan horticultural cropping systems in the context of climate change

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The Horticultural Systems (HortSys) research unit of CIRAD undertakes with its partners in Sub-Saharan Africa, agroecological research which aims to: (i) locally manage plant health risks sustained by fruit and vegetable producers, which are exacerbated by climate change (CC), in view of adapting cropping systems to its effects; (ii) adapt crop protection practices in order to mitigate CC at the global scale; (iii) prevent / anticipate the introduction / establishment in Europe of exotic pests that have become potentially invasive due to CC, by better management of the same in the areas of production of export crops.
For instance, with the optimization of food webs involving Bactrocera fruit flies associated to fruit tree orchards in West Africa, all the above three aspects are encompassed since: (i) CC is likely to impact established biological control by de-regulating interactions between natural enemies and pests, due to greater susceptibility of higher trophic levels to CC effects; (ii) availability of a low-cost natural protection option will prevent fruit producers from cutting their trees, thus avoiding carbon destocking; (iii) Bactrocera fruit flies have become quarantine pests in Europe where they now may establish due to CC.
Similarly, with "insect nets" which are increasingly used for protecting vegetable crops against arthropod pests, both in Eastern and West Africa: (i) microclimate under nets is likely to be modified by CC, which will require site-specific adaptations (*e.g.* highlands of Kenya *vs*. lowlands of Benin, where nets may have either a positive or negative impact on crop physiology and fungal plant diseases); (ii) the use of physical barriers drastically reduces losses and thus useless investment in chemical fertilizers and pesticides with high carbon footprints; (iii) the quarantine status of several vegetable pests, *e.g.* the whitefly *Bemisia tabaci*, has been altered by CC.