

les dossiers
d'AGROPOLIS
INTERNATIONAL

Expertise of the scientific community



Agronomy
Crops and cropping systems

physical properties, ensure deep rooting, restore organic matter levels, while contributing to the biological activity and improving mineral bioavailability. This research is complemented by studies on the impacts of ecological intensification practices on pollutant flows.

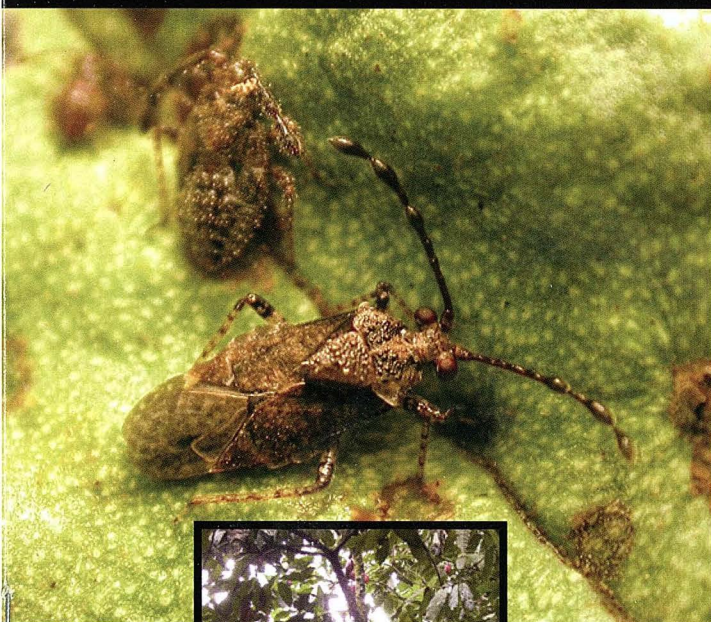
■ **Sustainable cropping system development and assessment.**

The research is based on pooled knowledge acquired by the unit in the first two lines of research (using modelling tools) and on prototyping of cropping systems (designing systems on the basis of expertise, and model-assisted design). The systems are participatively evaluated in the framework of partnerships with the production sector.

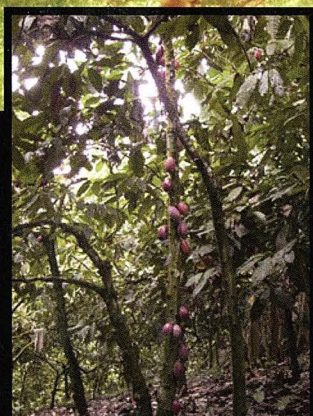
Studies are carried out in partnership with other research units and institutions (e.g. LISAH, SYSTEM, PSH, UR Tropical Agrosystems (West Indies), *Faculté universitaire des sciences agronomiques de Gembloux* and the *Université catholique de Louvain* (Belgium), Rothamsted Research (UK), etc.). One partnership led to the development of the African Research Centre on Banana and Plantain (CARBAP), a regional research platform (countries of the Economic and Monetary Community of Central Africa). The unit also conducts research in networks of national (Latin America, Africa), regional (International Center for Tropical Agriculture, etc.) and international (Bioversity International, etc.) scientific and technical partners.

A collaborative initiative developed with banana and pineapple production subsectors in Guadeloupe and Martinique (UGPBAN) led to founding of the Institut technique de la banane (ITBAN) and the *Plan Banane Durable Guadeloupe-Martinique*. ■

Contribution to cocoa mirid control in Africa



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▲ *Sahlbergella singularis* adult and nymphs on a cocoa pod.

Inset - Cocoa plantation.

Cocoa cropping is one of the main income sources of rural families in the forest region of Cameroon. However, this crop is hampered by pests such as mirids. *Sahlbergella singularis* and *Distantiella theobroma* are the most damaging cocoa crop pests in Africa. In some countries, they are responsible for cocoa production losses of 30-40%.

Pest control requires a good overall understanding of agroecological mechanisms and factors involved in the pest's natural population dynamics. The biology of *Sahlbergella singularis* was therefore studied using laboratory reared mirids. A study of the demographic parameters of the reared population revealed that *S. singularis* is a slow growing species. This explains its low population densities in plantations. Fertility is also a key parameter explaining seasonal variations in natural populations. The growth of natural populations is thus associated with the presence of young cocoa pods, which provide females with a food source favourable for reproduction. A study on the impact of agroecological factors on *S. singularis* population densities in plantations revealed that densities depend on the cocoa crop plot conditions. Pesticide treatment, shading and the use of hybrid varieties are key cropping factors. Populations of this pest are also highly aggregated in plantation areas benefitting from maximum sunshine. Forest tree shade was found to be more uniform than fruit tree shade and therefore less conducive to the development of heavily infested areas, which are commonly called mirid pockets.

Mirid control recommendations of agricultural researchers are seldom applied by cocoa growers. The results have also been discussed with the aim of tailoring them to the cocoa cropping conditions that currently prevail in Cameroon.

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