

The « BarCo » project: for the promotion of barrier crops to curb the expansion of the Cocoa swollen shoot virus in Côte d'Ivoire

Régis Babin¹

Franck Zokou Oro², Mathias Gnion Tahi³, Pierre Walet N'guessan⁴, Emmanuelle Muller⁵,
Thomas Wibaux⁶

¹CIRAD

²Université Peleforo Gon Coulibaly, Korhogo, Côte d'Ivoire

³CNRA, Divo, Côte d'Ivoire

⁴CNRA, Divo, Côte d'Ivoire

⁵CIRAD, UMR AGAP, Montpellier, France

⁶CIRAD, UMR ABSYS, Abidjan, Côte d'Ivoire

ABSTRACT

The Cocoa swollen shoot virus disease (CSSVD) is considered as a threat in Côte d'Ivoire since the early 2000s, when serious outbreaks were reported in the Central-West region. Today the disease has reached most of the production areas, becoming a major threat for cocoa industry. Control measures currently implemented by cocoa sector are the destruction of infected cocoa trees and their closest neighbors. This strategy has proven alone ineffective, as new disease outbreaks have often been reported in the young cocoa plots. Among plant diversification strategies proposed by research, the use of barrier crops has proven effective in protecting young or mature plots from CSSV in Togo and Ghana. This strategy is based on the hypothesis that cocoa monocultures on vast and continuous areas, which were promoted in a recent past, are conducive to CSSV expansion. The virus is transmitted from an infected cocoa tree to a healthy one by mealybugs, which do not meet any obstacle to their dispersion in large monocultures. The BarCo project "Towards the use of barrier crops and biological control of vector mealybugs to curb the spread of the Cocoa Swollen Shoot Virus (CSSV) in Côte d'Ivoire" was implemented from June 2018 to December 2020, with the objective to test and promote barrier crops as a strategy to reduce the progression of CSSV in affected production areas, especially the region of Soubré (South West of Côte d'Ivoire). A living lab approach was adopted, where members of two farmer cooperatives were involved in all stages of the project. A set of fourteen 0.25 ha cocoa plots surrounded by 10 m large hedges of coffee (*Coffea robusta*) or acacia (*Acacia auriculiformis*), or without hedges (control plots), was implemented within large CSSVD outbreaks in mature cacao plots. About 330 farmers were trained on CSSVD symptoms, vector mealybugs and good planting practices and a technical sheet was distributed in 1400 copies. A survey of 300 cocoa farmers revealed a high level of comprehension and willingness to adopt the technology. However, other

barrier crops were preferred by farmers, in the forefront of which oil palm, cashew and bitter cola (*Garcinia cola*). Sixteen-month observations revealed that CSSVD symptoms were not detected in the plots, whereas populations of at least four mealybug species were early recorded on young cocoa trees and coffee. The effectiveness of barrier crops in controlling the CSSVD is presented and discussed.

Keywords: Plant diversification, Planting pattern, Vector mealybugs