



How intensification-sustainability strategies influence the regulation of pests and diseases in coffee agroforestry systems

* Rolando Cerda, CATIE, Costa Rica

Alejandra Ospina, CATIE, Costa Rica

Fernando Casanoves, CATIE, Costa Rica

Jeremy Haggard, University of Greenwich, United Kingdom

Erick López de Paz, Universidad del Valle de Guatemala, Guatemala

Sergio González-Mollinedo, Universidad del Valle de Guatemala, Guatemala

Clémentine Allinne, CIRAD, France

10:30

Pests and diseases (P&E) cause coffee losses that threaten the well-being of millions of rural families. Coffee farmers manage their agroforestry systems with strategies that combine levels of agronomic intensification and diversity of vegetation. Different strategies lead to particular injury profiles (set of P&E incidences) which in turn cause certain yield losses. In this research we evaluated 180 coffee plantations in a wide range of management intensities and agroforestry compositions, and in contrasting agroecological conditions in Costa Rica and Guatemala, with the objectives of: analyzing the associations of injury profiles and losses under distinct strategies, and identifying possible combinations of intensification and sustainability practices that regulate the impacts of P&E. We measured P&E incidences, yield loss indicators (dead branches and branches with die-back), diversity and shade cover in the field, and through interviews we collected information on management and costs. Our results show that the injury profiles that cause the major coffee losses have the highest incidence of rust (>60%) and also highlight other diseases such as brown eye spot and anthracnose; furthermore, these profiles are more associated with lowlands and with strategies of low investment in fertilization and P&E control (low intensification), and low shade cover. Among the practices that most contribute to reducing losses are the use of disease resistant varieties, fertilizations that especially provide Phosphorus and Potassium, and shade cover levels of 40-60%, which can yield >30qq/ha of green coffee. Overall, our findings suggest that it is possible to apply strategies that combine intensification with sustainability (reflected by diversity and shade cover), which result in an expression of manageable injury profiles, with reduced losses and good yields. This is an important message and support for technicians and farmers to promote and/or adjust this type of strategy to Central American coffee plantations.