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Evaluating Pest and Disease Incidence in Different Cacao Production Systems in Bolivia

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Abstract

Cacao production (*Theobroma cacao* L.) is an important cash crop for mainly smallholders in the tropical lowlands of Latin America, West Africa, and South East Asia. Pest and diseases might considerably affect cacao production. Agroforestry systems are thought to host more pest and diseases compared with monocultures due to for instance higher air humidity and less aeration.

The aim of this study is to compare the incidence of pest and diseases in different cacao production systems. The study was performed in 2016 in a long-term trial established in Bolivia in 2008 within the framework of the SysCom programme (www.systems-comparison.fibl.org). Five different systems are compared, i.e., monoculture and agroforestry systems under organic and conventional management and one successional agroforestry system with organic management.

Frosty pod rot (Moniliophthora roreri), one of the most important fungal diseases in the study area, was monitored every two weeks during the harvesting season, mainly from April to October. All the infected pods by frosty pod rot were registered, and were cut to avoid the spread of the spores. At harvest, the incidence of other pest and diseases, was registered. Harvest was done also every two weeks.

The results show a very low percentage of pods affected by pests and diseases, about 10 % in all the systems. Frosty pod rot was the most important disease, i.e., about 70 % of the infested pods were affected by it. It was followed by witches broom (Moniliophthora perniciosa), black pod (Phytophthora) and pods eaten by birds or mammals. The incidence of the mirid (Monalonion disimulatum), which was quite high in the study area some years ago was almost negligible.

The relative total number of pods affected by pests and diseases did not differ between production systems. The same results were found for the pods affected by frosty pod rot, which means that the more humid microclimatic conditions of the agroforestry systems are not promoting its spread and the sporulation of the spores. In the successional agroforestry systems there were more pods eaten by birds or small mammals, which indicates that this system supports the presence of these animals.

Keywords: Agroforestry systems, conventional farming, monocultures, organic farming

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