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## Assessment of Farmers’ Plant Disease Knowledge in Organic Cacao Cultivation

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### Abstract

The Alto Beni region on the eastern foothills of the Andes accounts for 90 % of certified organic cacao production in Bolivia and other tropical products for the city of La Paz. In the region more than 2200 households strongly depend on the cultivation of cacao. Cacao is cultivated on small holder farms mostly in diversified agroforestry systems. These systems contribute to both the conservation of biodiversity and the food security of the farmers.

An outbreak of the frosty pod disease caused by *Moniliophthora roreri* in 2011 is now threatening these relatively sustainable production systems. Examples all over Latin America showed the abandonment and elimination of cocoa systems and the loss of biodiversity and local revenues after its attack. Frosty pod rot is an extremely invasive and destructive disease causing yield losses of 30–80 % after establishment in a region.

An efficient and applicable disease management strategy should address both, ecologic and socio-economic conditions of the entire agro-ecological system. Scientific knowledge must therefore be complemented with the local farmers’ knowledge in general and especially their local knowledge on disease management. The aim of this qualitative study was to gather farmers’ local disease knowledge to building a fundament for the participatory development of a disease management strategy. Data was collected by combined 24 in depth interviews with on-farm field visits.

We found that there is a certain lack of ecosystem knowledge among the ethnically diverse farmers group, which might be due to the recent colonisation of the area. Cacao cultivation knowledge is present on a basic level but is unequally distributed and the level of performance of disease prevention and control practices lags behind their level of awareness.

It was also found that the process of knowledge formation is ongoing and co-evolving with the active adaptation of the cultivation system. Most sustainable practices related to an additional labour input are strictly challenged by the lack of skilled labour and the migration out of the region into the bigger cities. These constraints should be considered when designing an efficient disease management strategy.

**Keywords:** Bolivia, local knowledge, *Moniliophthora roreri*, participatory technology development, *Theobroma cacao*