Trees and agriculture — Oral Presentations

**Herbaceous Species Cacao Production Systems: Biotic**

**Homogenisation and Dynamics Over Time in a Long-Term**

**Trial in Bolivia**

LUIS MARCONI RIPA1, RENATE SEIDEL1, LAURA ARMENGOT2

1*San Andres University, Inst. of Ecology, Bolivia*

2*Research Institute of Organic Agriculture (FiBL), Switzerland*

The different types of cocoa production have an impact on the spontaneous diversity

of the cropping systems. Plants, and specifically herbs, are one of the most susceptible

groups to the transformation of forests into cropping land. We study the plant species

of the herbaceous stratum in an experimental trial in Bolivia, where five production

systems representing a gradient of management intensity were compared: two monocultures

and two agroforestry systems under conventional and organic farming containing

a planted cover crop layer, and a complex successional agroforestry system

with no external inputs.

In a first study we explored the role of potential role of agroforestry systems and management

intensity in diversity conservation and against biotic homogenisation. We did

not find significant differences in species richness between production systems, but

higher number of species was found in the successional agroforestry system. However,

community composition did change following the management intensity gradient.

In addition, we found that widely distributed species, including some exotic

species, were associated to intensive management, i.e. monocultures and conventional

systems with high solar exposure levels and/or glyphosate application. Conversely,

successional agroforestry and organic systems harbored species with a geographical

distribution range restricted to the Neotropics or South America. Accordingly, cocoa

organic and agroforestry systems, could contribute to both biodiversity conservation

and the minimisation of biotic homogenisation.

In a second study based on Braun-Blanquet samplings of herbaceous strata over seven

years, we found that the differences in community composition were established at a

very early stage and time had a minor role compared with the selective pressure of

the production system. In the systems with more available resources (light, space)

we registered higher number of new species, but the pool from which they come from

depended on the production system.

So far we have found 171 different herb species in the trial. We have identified some

species that could be used as cover crops if kept in the system under proper management,

which could reduce the weeding efforts. We have also identified species selected

and promoted by the use of glyphosate in the conventional systems.

**Keywords:** Agroforestry, biodiversity conservation, community composition, full-sun

monocultures, organic farming

**Contact Address:** Laura Armengot, Research Institute of Organic Agriculture (FiBL), Ackerstrasse

113, 5070 Frick, Switzerland, e-mail: laura.armengot@fibl.org

ID 284 129