

# The role of fruit trees in organic coffee agroforestry systems in Turrialba, Costa Rica

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## Introduction

The coffee crisis has had a severe impact on coffee producers around the world. Among the strategies for coping with the crisis, product diversification (timber, fruits, etc.) and specialty coffee production (high grown, organic, bird friendly, etc.) play an important role for smallholders in Costa Rica and elsewhere. Apart from its strong susceptibility to price fluctuations, intensive, full-sun monoculture coffee production is associated with environmental degradation (e.g. erosion, groundwater contamination, habitat loss) and deforestation. Especially in regions with suboptimal site conditions for coffee production (high temperatures, degraded soils, etc.), the use of shade trees is recommended. Traditional and modern polycultural agroforestry systems provide the means for sustainable, diverse coffee production. In these, fruit trees are often used in combination with timber and N-fixing trees to provide shade and additional produce. Very little is known of their role (economic, ecological, structural), species composition, and impact on coffee production.



## Environment

- + contribution to diversity of tree strata  
→ complex habitat  
→ sustainable production system
- + less groundwater contamination
- + carbon sequestration

## Fruit trees for diversification pros & cons

### Agronomy

- + positive effects on microclimate, soil organic matter, erosion, etc.
- + agroecosystem stays intact after harvest
- suitability dependent on species, distribution, management

### Economy

- + stable income over decades
- + contribution to family livelihood
- + financial flexibility for better coffee production
- difficult access to (organic) markets



### Market access

- ♦ organic market
- ♦ local, regional
- ♦ export

### Suitable species

- ♦ compatibility
- ♦ site conditions
- ♦ commercial

## Restrictions

### Transport & Infrastructure

- ♦ vehicles & roads
- ♦ local cooperation
- ♦ information flow

## Materials & Methods

In January and February 2005, interviews with 30 organic coffee producers were carried out in Turrialba, Costa Rica. Due to the climatic conditions in the region (low elevation humid tropics), the use of shade trees is widespread among coffee farmers and is seen as essential for successful organic production. Central topics of the semi-structured interviews were:

- Characterization of the fruit trees present (species, amount, production)
- Identification of factors restricting increased fruit production and commercialization
- Perceived impact of fruit trees on coffee production and identification of suitable species for intercropping with coffee

## Results & Discussion

- The farmers in the survey have a highly diverse production of fruits (41 different species) integrated into their coffee fields which generates approximately 1/3 of the farm income. Most farmers use a combination of fruit, timber and service trees for shading their coffee plants. The choice of fruit species is mainly governed by commercialization possibilities, not by ecological or agronomical considerations such as erosion control, biodiversity or compatibility with coffee. Higher quantities are only produced of bananas, citrus, plantain, and guava, which have a fairly secure market. As the other fruits serve mainly for household consumption or are lost, finding accessible markets for less common products may be crucial for sustaining and promoting higher diverse production systems.
- The diversification of their finca is perceived as an economical benefit (higher income and security), especially under the impression of the coffee price decay, rather than as a means towards sustainable, environmentally sound coffee production. Farmers identified the low prices for (ecologically produced) fruits on the local market, inadequate transportation possibilities and infrastructure as the main restricting factors for sustaining or expanding the production of fruits. Also, lack of information on proper fruit tree management, pests and diseases, larger-scale commercialisation and processing currently hinder further development.
- The integration of fruit trees into coffee agroforestry systems is an important contribution to sustainable, ecological production, providing the farmers with food and income, and lessening their dependence on a single cash crop. Overcoming the restrictions mentioned above and promoting these complex agroecosystems in coffee-producing countries around the world may lead to more stable, ecologically and economically sustainable production of coffee.

