



Coop Research Program | Call 1

Cadmium availability in soils and its uptake by cocoa in Latin America

Background

Cadmium (Cd) is a trace metal that has no essential biological functions and is toxic to plants, animals and humans even at low concentrations. Cocoa products have relatively high Cd concentrations in comparison to other foodstuffs. This is becoming an important issue for smallholder farmers as well as for the chocolate industry, as the European Union is currently debating the implementation of upper limits for Cd contents in cocoa products imported to the EU. Cocoa products from Latin America generally have higher Cd concentration than cocoa from West Africa, however there is considerable regional variation. While this variation is primarily attributed to differences in soil parent material, other factors like cultivation practices must also be considered. The available data are insufficient to draw any firm conclusions about the contributions of different factors.

Objective

The overall research objective is to address to the problem of unusually high Cd content in cocoa beans grown in Latin America by determining the sources of Cd in the soils and factors that influence Cd uptake by cocoa plants. Research will be carried out in Honduras and Bolivia where samples will be taken from a large number of sites covering a wide diversity of soil and climate conditions and from plantations employing different management practices. Researchers will use the outcome of the survey to propose management strategies to reduce Cd concentrations in cocoa beans.

Research Approach

Soil survey and sampling in Honduras and Bolivia; soil and plant analysis; farmer questionnaire on land management and cultivation practices and history; statistical analysis.

Relevance and Expected Outcomes

The project will show (1) the extent to which Cd accumulation by cocoa depends on soil and climate factors, and (2) the potential to reduce it through agricultural management practices. The research also addresses a gap in knowledge about Cd uptake by plants in tropical regions. Results will help producers and the chocolate industry alike to prepare for future limits on the allowable Cd content in cocoa.

Food System Challenges Addressed

Sustainable production systems, Soil health, Food safety.

www.worldfoodsystem.ethz.ch/research/research-programs/CRP

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Project Duration 2014-2016

Project Cost 204'000 CHF

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