

## SOIL EROSION AND RUNOFF OF AN ACRISOL UNDER FOUR AGRONOMIC TREATMENTS IN MEXICO

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The REVOLSO Project (Alternative Agriculture for a Sustainable Rehabilitation of Deteriorated Volcanic Soils in Mexico and Chile, 2002-2006. European Union INCO/DEV Project #ICA4-CT-2001-10052) aims at finding technological solutions, adapted to socio-economic local conditions, to rehabilitate unproductive and erodible deteriorated volcanic soils in a sustainable way (<http://www.ird.teledetection.fr/revolso>).

This work presents the main results of one year of runoff and soil erosion measurements on an Acrisol in Morelia district, Michoacán State, Mexico.

Four treatments are tested on 1000 m<sup>2</sup> plots: (1) C-Conventional: faba beans as a monoculture, with low agronomic inputs; (2) CI-Conventional improved: faba beans + *Vicia sativa*, with high inputs; (3) O-Organic: faba beans as a monoculture, applying 15 t ha<sup>-1</sup> of cow manure, and (4) F-Fallow system, which had the native vegetation with free grazing animals.

Rainfall parameters, soil moisture and bulk density, infiltration, soil rugosity, plant cover, and crop developmental sequence are measured as well as soil, sediments and water parameters as pH, EC, CEC, N, P, K. Every plots are equipped with an H-flume and a water level recorder. The affluent is conducted to a rotating tank of 2000 l seated on two electronic weight cells. When it is full, 2% of the excess of water is collected in another reservoir. Water and sediments samples are analyzed.

The rainy season started late at the end of June and finished in November. The annual rainfall was about 1320 mm, 32% more than the mean value; 128 days present rainfalls but only 22 generated runoff. 15 rainfalls had more than 30 mm; 10 rainfalls had an intensity between 10 to 20 mm\*h<sup>-1</sup>, four had between 20 to 50 mm\*h<sup>-1</sup> and the strongest had 62, 83, 91 and 141 mm\*h<sup>-1</sup>.

Annual erosion rates ranged from 1 to 14 t\*ha<sup>-1</sup>. The F treatment produced the lowest erosion rate but the highest runoff rate. The O treatment got the highest erosion, followed by the CI (13 t\*ha<sup>-1</sup>) and the C (11 t\*ha<sup>-1</sup>).

Keywords: soil erosion, faba bean, fallow, Acrisol, Mexico

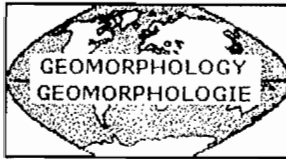
## EFFECT OF LAND USE CHANGE ON SOIL QUALITY AND SOIL EROSION IN A TROPICAL DECIDUOUS ECOSYSTEM (CHAMELA, MEXICO)

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In the last 50 years, the tropical deciduous forest in Mexico has been severely transformed into pasture. This conversion leads water soil erosion as a main degradation process. Soil aggregates and their stability have an influence on physical properties, resistance to erosion and the soil's ability to transmit liquids, solutes, gases and heat, which have a strong influence



International Association of Geomorphologists

## Regional Geomorphology Conference Mexico 2003

Geomorphic hazards:  
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Mexico City, October 27 - November 2, 2003

*Hosted by*  
Mexican Society of Geomorphology  
Institute of Geography, UNAM

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