Introduction

In Northern Vietnam, agricultural land is under strong pressure to meet population and economic requirements with maize as the major crop, often intercropped with cassava. Current production systems of maize and cassava make fields prone to erosion, which leads to a spatial variability of crop performance due to an unequal decrease in soil fertility.

Objectives

• Assessing spatial variability in maize development and yield at landscape level
• Explaining differences in crop performance between fields based on distance from the homesteads

Material and Methods

This study was conducted in the Chieng Khoi commune, Yen Chau district, Son La province, Northern Vietnam. The area has a tropical monsoon climate with very hot, wet summers and dry, cool winters. Three fields were selected according to distance to homestead. In each field, plant density, plant height, leaf area index (LAI) and greenness of leaves (SPAD) were measured at four growth stages on upper, middle and lower slope position. At final harvest, yield parameters were assessed at the three slope positions. Changes of surface levels were measured with erosion pins to predict erosion rates.

Results

• Fields with longer distance to homestead have a more recent cropping history and have, therefore, a higher yield potential than fields closer to homestead which were already cultivated for longer periods.
• Fields with long-term cropping history show a higher variability in grain yields depending on slope position
• Strong changes on surface level were observed in all fields and slope positions.
• 55 days after planting, SPAD values were similar in all fields and across slope position (~ 47) within a field; 110 days after planting, values of Field 1 and 2 started to differ among slope positions.
• LAI values developed differently across fields and among slope position within a field.

Conclusions

Distance of field to homestead influenced crop productivity. This effect was driven by land use history.

Spatial variability of crop development within a field is linked to slope position which again is linked with soil losses.