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## Spatial Variability in Yield and Growth Performance along Rice Paddies in the Mountainous Regions of North-West Viet Nam

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### Abstract

In the mountainous regions of northern Viet Nam, the majority of the rapidly growing population depends on the cultivation of paddy rice in lowlands and crops such as maize and cassava on upland areas with relatively steep slopes which are highly susceptible to degradation by erosion. Both systems, however, are often linked with each other. Runoff water translocates soil particles to lower areas where the deposited sediments may have a significant impact on the nutrient balance, yields and crop performance of paddy rice. This study focus on a better understanding of the influence of land-use intensification and related nutrient flows from uplands on the productivity of paddy rice in the lowlands. The aim was, therefore, to assess the effect of sediment loaded irrigation water on the spatial variability of rice growth and yield along a sequence of paddy rice terraces. The study was conducted in the Yen Chau District, Son La Province, Northwest Viet Nam, i.e. in Ban Me and Ban Put, two villages located in an intensively cultivated sub-catchment within the Chieng Khoi Commune. Data on leaf chlorophyll content, leaf area index (LAI), tillers per hill, plant height, and yield parameters of Nem 87, a short term hybrid rice variety of 120 days, were collected in four sequences of paddy fields during February and June 2007. All fields were subdivided into fertilised and non-fertilised parts to identify the effect of incoming sediments on the soil fertility of the paddy fields. Data were collected at five growth stages, following a grid to assess spatial variability within a field. Chlorophyll content and LAI were assessed by using a SPAD-502 and a LAI-2000 metre respectively. Two months after transplanting, plots show clear trends of spatial variability in crop response which could be related to flow directions of irrigation water and distance to the irrigation channel. Data collection is in progress and will allow a critical assessment of trade-offs and interactions between upland and lowland systems and provides information for improving agricultural production in these fragile ecosystems.

**Keywords:** Chlorophyll, crop response, LAI, paddy rice, spatial variability