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The Potential of Legume Adoption in Upland Maize Fields: A Case Study in Northern Thailand

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Abstract

This study investigates the biophysical and socio-economic constraints to legume production as well as the economic potential of integrating legumes in maize-based cropping systems in upland areas of northern Thailand. Thailand has experienced a tremendous growth in the maize sector due to increasing demand for maize grains from the livestock and poultry industry. Subsequently, massive expansion of maize farming area has been observed in Thailand, especially in the northern region. The prevailing high-external-input development pathway is constraining for capital-poor smallholders and risks driving them into debt. The introduction of nitrogen-fixing legume crops into the maize-based cropping systems could complement or replace inorganic fertiliser inputs. However in reality, the adoption of such practices by smallholder maize farmers remains low. A comparative study between a maize monocropping system and a maize/legume relay intercropping system was carried out in two villages located in Nan and Chiang Mai provinces. Farmer surveys, participatory rural appraisal tools and key informant interviews were the core methods of the study. The results show that both cropping systems have equal profitability, although the maize yield in the maize/legume relay intercropping system was lower than in the monocropping system. The low selling price was the most cited deterrent from introducing legumes by the non-adopters. In contrast, the high selling price, ease to grow and harvest, low start-up costs and ability of legumes to improve soil fertility were the four main criteria that determine the adopters' choice of legume species. Among the four cultivated legumes (ricebean, groundnut, cowpea and lablab bean), ricebean fulfilled all the criteria for the choice of legume species. Based on the results of this study, it appears that there is a potential to integrate ricebean in the non-adopters' fields. The results of the present work also suggest that switching from a maize monocropping system to a maize/legume relay intercropping system could be a low-cost pathway to intensification that would minimise the use of nitrogen fertilisers. This study identifies the adoption constraints experienced by upland maize farmers and may inform agricultural policy makers as well as development practitioners to define their strategies for promoting legume adoption.

Keywords: Adoption constraints, legume integration, relay intercropping, selection criteria, smallholder farmers

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