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Exploring Input Options for Crop Intensification and Diversification in Maize-Based Farming Systems in Malawi

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Abstract

Crop production by smallholder farmers in Southern Africa is characterised by cultivation of maize as a staple food on a large share of the agricultural land. Limited nutrient input results in soil nutrient depletion over time. There is need for productive farming systems that are better adapted to a changing climate, and that produce more diverse food to achieve both food and nutrition security. We combined yield results of 50 maize, 28 soybean, 24 groundnut and 26 sweet potato on-farm input trials with economic analysis and focus group discussions in Central Malawi to explore options for crop intensification and diversification. Due to proper crop management and the use of good varieties in a season with above-average rainfall, excellent mean trial yields of 5.0 t ha^{-1} for maize, 3.4 t ha^{-1} for soybean, 2.5 t ha^{-1} for groundnuts and 13.2 t ha^{-1} for sweet potato were achieved. Responses to various combinations of inorganic fertiliser and lime were highly variable, but applications enhanced yields in all crops. Although maize production and investments in maize fertiliser were not as profitable as the other crops, fertiliser application to maize gave the best returns of food per amount of money invested. Better yield responses and value cost ratios showed that investments in fertiliser and lime in soybean was more worthwhile than in groundnut, though the financial benefits were somewhat hidden by high groundnut prices. While there is potential to derive better financial returns from diversification and intensification with legumes and sweet potato, farmers prioritise maize in terms of land area and resource allocation. Policies to enhance crop diversification and intensification should address the main constraints of lack of awareness of the agronomic and financial benefits of nutrient application to legumes and sweet potato, unstable markets, access to credit and access to improved seed.

Keywords: Crop diversification, fertiliser, soil fertility, sustainable intensification, yield variability

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