African banana yields are less than the potential.

Most soils in the region are weathered tropical soils (Acrisols, Ferralsols) with small nutrient stocks. Continuous production without soil inputs has led to nutrient depletion. Constraints to fertilizer use include its high cost and poor availability. Fertilizer use by farmers is also complicated by heterogeneous production and farmers’ resource endowments.

The study evaluated fertilizer and mulch effects on banana yields across Uganda. Demonstration plots had higher yields than control plots. Differences in yields were mainly due to fertilizer and mulch applications. Weed densities were also reduced in demonstration plots.

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Southern regions, could have also contributed to the yield differences between the two plot types. Mulch from crop residues has been reported to increase productivity in bananas (Bananuka et al., 2000) and plantains (Salau et al., 1992) and to suppress weeds in other crops (Ramakrishna et al., 2006). In addition, the improved leaf area production of a healthy banana plant has been reported to reduce weed pressure (Olasantan et al., 1994). There were differences in responses among regions, and these were partially attributed to differences in nutrient deficiencies. These findings are in partial agreement with findings in other studies and indicate that fertilizer use can improve banana production but recommendations should be site-specific and should address existing nutrient deficiencies in farmers’ fields.

The Marginal Rate of Return (MRR) of the demonstrated technology (fertilizer and external mulch) decreased with increasing distance to the capital (a major market for bananas) for Central (17, 43, 46 and 80 km away from the capital for Wakiso, Mukono, Luwero and Mpigi, respectively), South (138 and 216 km for Masaka and Rakai, respectively) and Southwest (290 and 322 km for Mbarara and Bushenyi, respectively). The MRRs were low in the Southwest (<50%) compared with Central, South (except Rakai) and East where MRRs were above 100% (Table 1). The low MRRs in the Southwest were due to low farm gate prices and poor crop response in the region compared with other regions. The study showed that farmers whose main market was within 160 km of the capital were likely to adopt the use of fertilizer (MRR≥100%) in 2006/7.

Based on the fertilizer prices of 2006/7, purchase of external nutrient inputs may not be very profitable in areas that are far from the market. Moreover, the current high banana production in Southwest Uganda, which is far from the capital (Kampala), is unlikely to be sustainable due to massive soil mining. Decline in productivity, particularly in the South and Southwest regions, would cause serious food shortage in the country. These regions produce approximately 61% of the total banana output in the country (Spilsbury et al., 2002).

From the study, we conclude that use of fertilizer and mulch in highland banana systems can be highly profitable, but recommendations should not be generalized into “blanket” treatments that apply for an entire country. Profitability and adoption of fertilizer use can be substantially improved if fertilizer recommendations are tailored to the primary plant nutrient deficiencies currently observed in farmers’ fields, and take into consideration the cost of inputs and banana prices. Intensification of production of banana (a perishable and bulky commodity) should occur close to the large urban markets, while storable and dry commodities like coffee can be produced far from the markets. Although our study was based on data collected in Uganda, the findings suggest that there is a need to provide farmers in Uganda and other East African countries (i.e. Tanzania, Kenya, Rwanda, Burundi and the Democratic Republic of Congo), where similar production systems for highland banana are found, with site-specific fertilizer recommendations to improve adoption of fertilizer use and crop productivity.

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References


Table 1: Summary of partial budget of the benefits and costs of demonstration plots over controls.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Central</th>
<th>South</th>
<th>Southwest</th>
<th>East</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wakiso</td>
<td>Mukono</td>
<td>Luwero</td>
<td>Mpigi</td>
</tr>
<tr>
<td>Difference in net benefits (USD/ha/yr)</td>
<td>1525</td>
<td>941</td>
<td>309</td>
<td>815</td>
</tr>
<tr>
<td>Difference in costs (USD/ha/yr)</td>
<td>264</td>
<td>254</td>
<td>252</td>
<td>344</td>
</tr>
<tr>
<td>MRR (%)</td>
<td>575</td>
<td>370</td>
<td>123</td>
<td>237</td>
</tr>
</tbody>
</table>

Banana prices (USD/kg) averaged 0.17 (Wakiso, Mukono), 0.16 (Luwero), 0.11 (Mpigi), 0.09 (Masaka), 0.07(Rakai, Mbarara and bushenyi) and 0.10 (Mbale). Fertilizer prices averaged USD 0.56 /kg of fertilizer.

aDifferences in net benefits were calculated by subtracting cost of fertilizer and mulch from the value of yield.

bCalculated by subtracting costs in control plots from costs in demonstration plots. Costs were for purchase, transport, and labor for application of mulch in control plots and fertilizer and mulch in demonstration plots.

cMarginal rate of return of investment of demonstration plots compared with control plots calculated by dividing difference in net benefits by difference in costs.


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