**Seed Potato for Africa** 

# COST BENEFIT ANALYSIS OF SEED POTATO REPLACEMENT STRATEGIES AMONG SMALLHOLDER FARMERS IN KENYA

#### Introduction

 Potato yields of smallholder farmers in Kenya fall at 8 t\*ha-1 against expected yields of 35 – 40 t\*ha-1, mostly due to many factors seed tuber quality being one of them.

- •Most available seed tubers are informal leading low yields and economic losses.
- •To increase farmers accessibility to healthy low cost seed CIP scientists together with its partners developed a seed replacement strategy that lowers the cost of quality seed potato and at the

#### **Methodological Approach**

- The trials were set up in eight farms for three seasons. The study employed a participatory approach with at least 15 farmers per site.
- Strategies tested were certified seed (CF), positive selected seed (PS), randomly selected farmers seed (RSFS), seed derived from bulking of small quantities of CF in small seed plot (SSPT) synonymous to seed nursery (5% of the area demand bought in previous season for bulking) added with PS seed (5%SSPT+PS), or

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same time increases yields and profit margins.

The presented study aimed at increasing yield and profit margin of smallholder potato farmers by choosing best option in seed replacement strategy.

#### **Problem statement**

In most cases small scale farmers are not able to buy high quality seeds as they have inadequate funds, and the supply is also limited. This has led to recycling of farmers saved seeds resulting in buildup of diseases reducing yields and farmers making huge losses.





with RSFS (5% SSPT+RSFS), 20% CF seed combined with PS seed and RSFS respectively.







**Figure 2**. (A) Farmers training on SSPT establishment (B) Farmers establishing own SSPT. (C) Healthy crop stand from SSPT seed (right) poor crop stand from RSFS (left). (D) Farmer doing positive selection

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Figure 1. (A) A potato field devastated by bacterial wilt. . (B) Poor crop vigour caused by virus infections.

### Results

Results showed significant difference in profit between the strategies used.

- Profit margins increased by 1200-3000 US\$ compared to farmers seed qualities, however due to high investment cost for CF seed, profit margins of all integrated strategies with smaller CF seed influx quantities and PS were higher hence more likely to be adopted.
- •Furthermore, to reach similar profit margins than with farm saved seed, farmers have to at least double their yields when using CF seed compared to only between 5% (PS) to 22% (20% CF +PS) when using integrated seed quality improvement strategies.



Tuble 1. Compansen between the cost of investment, revenue and pront margins of the seed replacement strategies								
								Farmers
		20% CF	20% CF	SSPT +	SSPT +			common
Variable	CF	+ <b>PS</b>	+ RSFS	PS	RSFS	PS	RSFS	practice
Seed cost 2t/ha (USD)	1250	250	250	62.5	62.5	0	0	0
Transport cost	<b>400</b>	80	80	20	20	0	0	0
SSPT or PS cost /ha USD	0	40	0	150	100	50	0	0

Table 1: Comparison between the cost of investment, revenue and profit margins of the seed replacement strategies





SSPT or PS cost /ha USD	U	40	0	150	100	50	U	0
Input cost	800	800	800	800	800	800	800	316
20% interest/risk on investment	<b>490</b>	234	226	206.5	196.5	170	160	63.2
<b>Total investment cost in \$US</b>	2940	1404	1356	1239	1179	1020	960	379.2
Yield T/ha	49.3	44.4	41.7	<b>44.9</b>	35.6	34.2	11.8	8.4
<b>Income at selling price of 100 \$US/t</b>	<b>4930</b>	<b>4440</b>	4170	<b>4490</b>	3560	3420	1180	<b>840</b>
Profit in \$US/ ha	1990	3036	2814	3251	2381	2400	220	460.8

## **Conclusion and Recommendation**

Best option in terms of profits at little risks of losing the investment have been the combination of SSPT and PS.

The study recommends to promote integrated seed quality improvement strategies combining regular influx of small quantities of high quality seed with on-farm seed quality improvement methods adapted to smallholder farmers realities.

This document was prepared as a contribution to GIZ/BMZ project. All persons and institutions involved in the project are gratefully acknowledged. The opinions expressed herein are those of the authors and do not necessarily reflect the views of their institutions.

'Tropentag 2016 Solidarity in a competing world - fair use of resources -' September 18-21, 2016 University of Natural Resources and Life Sciences (BOKU Vienna)