

## Farmers First

<b>PHASE:</b>	Research Station	50 – 500 farmers	1,000 – 20,000 farmers	<b>Full Scale</b>
---------------	------------------	------------------	------------------------	-------------------

### Introduction

Common bean is a staple crop in much of East Africa, including western Kenya. However, disease is a problem for the bean varieties most typically available to smallholder farmers. In particular, root rot has been identified as a major suppressor of yields in western Kenya. One Acre Fund is working with the Kenya Agricultural Research Institute (KARI) to identify higher yielding, less susceptible varieties. One variety, KK8, has proven to be resilient in the face of root rot, and has proven popular among farmers.



Hailey Tucker/One Acre Fund

<b>\$231</b>	<b>Average profit impact per acre</b>	<b>43%</b>	<b>Farmer participation in the program</b>
<b>164%</b>	<b>Average yield improvement per acre</b>	<b>86-100%</b>	<b>Planting method compliance</b>

### Context and Trial Rationale

- The common bean is the second most popular crop grown in western Kenya and provides crop and diet diversification. This is particularly important in light of the threat of Maize Lethal Necrosis Disease (MLND), which has the potential to cause crop failures in maize in East Africa.
- The professionalization of the planting method and adoption of improved common bean seed by One Acre Fund farmers could help contribute to broader commercial adoption of improved bean seed in East Africa.

### Major Intervention Configurations

- **Research:** One Acre Fund consulted a range of experts, including Otsyula Reuben Masheti, head of the Grain Legume Program at KARI Kakamega, to develop new bean planting techniques and varieties.
- **New Varieties:** One Acre Fund worked with KARI and a private seed company to conduct the first bulking of an improved KARI Kakamega seed called KK8. This seed has resistance to a common fungal disease that causes significant yield reductions.
- **Input and plant population:** Trials were conducted with KK8 seed, DAP at 50 kilograms per acre, and a target plant population of 90,000 per acre. At scale, an older planting method

## Farmers First

was used with a lower plant population. Low yields were observed at scale due to problems with the seed supply and adverse weather conditions.

- Test Configurations:
  - 1) **Baseline small trial:** Local Variety (Kenya Rosecoco), 50 kilograms DAP
  - 2) **Agronomic small trial:** KK8 Variety, 50 kilograms DAP
  - 3) **Scale up test:** Certified Kenya Rosecoco + Wairimu Dwarf, 50 kilograms DAP, 54,000 plants per acre.

### A. Yield and Profit: Agronomic Results Summary

	Configuration	Location / Date	Yield	Profit* / Acre	Profit* Change vs. Trial Control
<b>1. Baseline:</b> Local Rosecoco, 50kg DAP, 90,000 plants / acre	Research Station	Western Kenya, LR 2013	166kg/ acre @ \$0.82 per kg	(\$44)	+ \$0
<b>2. Agronomic test:</b> KK8, 50kg DAP, 90,000 plants / acre	Research Station	Western Kenya, LR 2013	438 kg/ acre @ \$0.82 per kg	\$187	+ \$231
<b>3. Scale up test:</b> Certified Seed, 50kg DAP, 54000 plants / acre	25,992 farmers	Western Kenya, LR 2013	198 kg / acre @ \$0.82 per kg	(\$17)	+ \$23

\*Profit per acre includes expense of \$40 for land opportunity cost, \$50 for labor opportunity cost, and inputs cost.

### B. Farmer Adoption: High adoption due to low maize offering in base package

- Planting Method:
  - Farmers found the planting technique easy to understand, so compliance was close to 100%. However, there was significant disagreement with the recommendation of mono-cropping beans. One Acre Fund has traditionally recommended mono-crops due to poor results with intercrops that do not have the correct spacing or nutrient availability.
- Purchase Behavior:
  - In the 2013 season, One Acre Fund offered farmers 0.25 acres of beans. Close to 26,000 farmers bought this package, primarily due to the reduced quantity of maize available in the package due to MLND. In other seasons the adoption of beans has been lower.

## C. Operability at Scale: *Significant Challenges*

- One Acre Fund encountered a number of problems selling common bean at scale. First, the certified bean seed supply was not of high quality. This caused a number of germination and disease problems. Second, the varieties available at scale in 2013 were very susceptible to disease. The extremely heavy rains at the start of 2013 caused significant disease pressure and as a result farmers had a poor harvest.

## Next Steps

---

In the future, One Acre Fund will continue to:

- 1) Improve the planting method to achieve yields of 700 kilograms/acre and a profit of \$450/acre.
- 2) Scale up KK8 seed production to allow it to be sold at scale and continue to bulk other disease-resistant varieties.
- 3) Work with N2Africa and other intercropping experts to roll out a large set of intercropping trials.