

PHASE:	<u>Research Station</u>	<u>50 – 500 farmers</u>	1,000 – 20,000 farmers	Full Scale
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### Introduction

Historically, common bean has been the dominant legume for smallholder farmers in East Africa. However, over the past few decades, local governments and development and research organizations have pushed for greater cultivation of soybean. Soybean offers several advantages over common bean: 1) soybean has a nitrogen fixation potential 6 times greater than common bean; 2) multiple value-added products can be manufactured from soybean, including soymilk, soy mince, dry-roasted soy “nuts”, and soybean oil; 3) Soybean is one of the top global agricultural commodities and has a greater demand on the international market than common beans; and 4) there is concerted efforts by national governments to encourage greater farmer adoption of soybean.



Hailey Tucker/One Acre Fund

<b>200 kg N/ha</b>	<b>Nitrogen fixation capacity of soybean (kilograms of nitrogen per hectare)</b>	<b>5 t/ha</b>	<b>Yield potential of soybean (tonnes per hectare, 2.5x the yield potential of common bean)</b>
<b>0.7%</b>	<b>Percent of the global soybean market produced by African farmers</b>	<b>20,000 t</b>	<b>Soybean annual exports from Africa (tonnes)</b>

### Context and Trial Rationale

- The market for soybean in Africa is growing faster than any other staple crop.
- Soybean has high potential to improve food security and increase the livelihoods of millions of African farming families.

### Major Intervention Configurations

- **Research:** One Acre Fund consulted a range of experts to identify promising best management practices for soybean in East Africa. These include the International Institute of Tropical Agriculture (IITA), the International Centre of Tropical Agriculture (CIAT), the Kenyan Agricultural and Livestock Research Organization (KALRO), and N<sub>2</sub>Africa.
- **Field assessment:** Research station and on-farm field trials were conducted in Rwanda and Kenya in 2014.
- **Trial Configurations:**
  - 1) **Treatment:** Improved varieties, intercropping.
  - 2) **Control:** Traditional variety, mono-cropping.

## Farmers First

**A. Yield and Profit:** The below table summarizes agronomic results for Rwandan research station trials.

Trial	Configuration	Location / Date	Yield (t/ha)	Profit (USD/ha)	Profit Change vs. Trial Control
<b>1. Control:</b> Peka 6 + 100 kg/ha DAP.	Research* station	Rwanda, A-season 2014	0.5	\$386	N/A
<b>2. SC Saga:</b> SC Saga seed, 100 kg/ha DAP	Research station	Rwanda, A-season 2014	1.0	\$724	+\$338
<b>3. SC Sequel:</b> SC Sequel seed, 100 kg/ha DAP	Research station	Rwanda, A-season 2014	0.7	\$531	+\$145
<b>4. SC Squire:</b> SC Squire seed, 100 kg/ha DAP	Research station	Rwanda, A-season 2014	1.0	\$724	+\$338

The below table summarizes soybean intercropping data from research station and on-farm field trials in Kenya, 2014.

	Configuration	Location / Date	LER (land equivalence ratio)	Farmer preference (%)
<b>3. Intercropping – Mbili:</b> SC Squire in mbili intercrop with maize, 124 kg/ha DAP at planting, 124 kg/ha CAN at topdress.	Research station	Kenya, long-rain season, 2014	1.2	N/A
<b>4. Intercropping – Mbili:</b> SC Squire in mbili intercrop with maize, 124 kg/ha DAP at planting, 124 kg/ha CAN at topdress.	On-farm field trial, 170 farmers	Kenya, long-rain season, 2014	5.7	27%

\*For all research station trials, n=6.

**B. Adoptability:** *Medium Adoptability*

- While at the moment farmer adoption of soybean is not high, high soybean market value, processing plant development, and government incentives are increasing. All of these things will help to increase farmer adoption of soybean in future seasons.
- In Kenya there is strong farmer preference for planting legumes as intercrops. This will require extra complexity to develop best management practices for soybean.

**C. Operability at Scale:** *High Operability*

- Seed distribution easily fits into our current logistical infrastructure.

### Next Steps

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In 2015, One Acre Fund will target planting methods to improve soybean yield and nitrogen fixation capacity. If nitrogen fixation can be boosted, fertilizer use on soybean could be reduced. Reduced fertilizer use while maintaining yields would increase profitability and adoption potential.