Sorghum Varieties - 2015B Season, Rwanda

ONE ACRE FUND

Farmers First

PHASE:	Research Station	50 – 500 farmers	1,000 – 20,000 farmers	Full Scale

Introduction

Sorghum is a popular crop in certain parts of Rwanda, particularly in the B season. In 2015B 12% of One Acre Fund Rwanda clients cultivated sorghum across the program. However, in the most popular sorghum regions (East and South), 35-60% of farmers grew sorghum in 2015B. At the household-level, white varieties of sorghum are used to make porridge, whereas red varieties are used to make beer. Sorghum yields in Rwanda are generally about 75% of the economic optimum. In 2015B One Acre Fund, Rwanda investigated the potential for improved agronomic practices and improved sorghum varieties to increase yields and profitability for Rwandan sorghum growers.

Kaitlyn Smoot/One Acre Fund

2.1 tonnes/ha	**Current average sorghum yield in Rwanda**
3.6 tonnes/ha	**Economic optimum sorghum yield**
67%	**Yield increase for Seredo vs. local sorghum seed**
69%	**Profit increase for Seredo vs. local sorghum seed**

Context and Trial Rationale

- Sorghum is a popular crop in certain parts of Rwanda, but most farmers use traditional varieties with relatively low yield potential.
- Local sorghum varieties are often susceptible to disease and lack vigor.
- One Acre Fund Rwanda sought to test the relative yields of two commercially available sorghum varieties in Rwanda through Kenya Seed Company in comparison to local sorghum.
- There is also potential for sorghum yields to be increased through improved agronomic practice, namely fertilizer application and plant spacing.

Major Intervention Trials

Varieties: The following varieties were grown in pair treatment-control trials in 75 m^2 plots by all farmers:

1) **Local varieties:** varied by farmer choice; either white or red depending on preference. The most common variety chosen was Kajagari, a red variety, from seed saved in previous seasons.

2) **Serena**: a white variety from Kenya Seed promoted as being fairly tolerant to striga, rust, leaf blight, and grey leaf spot.
3) **Seredo**: a white variety from Kenya Seed promoted as a taller variety than Serena, tolerant to lodging and widely adaptable.

Planting: Farmers planted one control plot according to their usual practice and using local seed. Farmers planted another plot using local seed but following One Acre Fund guidance on planting: 10 cm plant spacing in rows spaced 60 cm apart.

Fertilizer: On all plots except the local-practice control, DAP was applied at a rate of 100 kg/ha, with urea applied at a rate of 50 kg/ha.

Location: Trials took place in 2 cells in Gatsibo district in the East of Rwanda and 1 cell in Huye district in the South. In all cases farmer participants were traditional sorghum growers.

A. Yield and Profit: The below table summarizes agronomic results.

Trial	Yield (t/ha)	Profit* (USD/ha)	Profit % change from Control	Height of plants (cm)	Farmer ranked as preferred
1. Control – Local variety + broadcast planting, no fertilizer	2.4	919	-	184	0%
2. Improved agronomic practice – Local variety + row planting, fertilizer	2.8	1,735	7%	183	7%
3. Seredo + row planting, fertilizer	4.6	2,929	80%	139	95%
4. Serena + row planting, fertilizer	3.5	1,206	31%	136	57%

*Assumes DAP = 465 FRw/kg, Urea = 390 FRw/kg, local seed = 500 FRw/kg, Seredo and Serena = 1,500 FRw/kg and sales price of sorghum grain is 307 FRw/kg

B. Adoption: *Low/Medium*

- As overall sorghum cultivation is only 12%, even in the B season, and less than 5% in the A season, sorghum never be a high demand product across the program.
- There may be high regional demand in the areas were sorghum cultivation is more intensive and the importance might increase as MLND continues to spread in the B season and farmers reduce the amount of maize grown in favor of other crops.
- This product is an OPV, there may be preferences from farmers for varieties that they can save and reuse.

C. Operability at Scale: *High*

- Sorghum seed is not more difficult to transport or store than other seed currently in the program.
- Kenya Seed Company already commercially imports these two varieties into Rwanda. These varieties are available at scale.

Next Steps

- In 2016B One Acre Fund Rwanda will conduct planting method, fertilizer, and variety trials in a wider range of locations.
- We will trial methods to increase adoption of row-planting and fertilizer use on local sorghum in two full districts (Gatsibo and Gisagara). Yield gains and impact can be gained by scaling agronomic best management practices, irrespective of selling improved seed.
- Seredo and Serena will be trialed again, but we will also trial up to 4 new red varieties.
- In 2017A-B we will initiate small-scale sales trials of the best sorghum varieties.