

Farmers First

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

Both climbing and bush beans are staple crops in Rwanda, each having a particular benefit. In land-constrained fields, the vertical production of climbing beans increases land use efficiency over bush-type varieties. However, bush bean management can be simpler, and the earlier maturity is sometimes preferred. In 2014, One Acre Fund evaluated eleven different bush and climbing bean varieties in Rwanda, for both yield and farmer preference. Because households in Rwanda frequently suffer from iron deficiency and anemia, iron-enriched varieties developed by Harvest Plus were also evaluated.



Hailey Tucker/One Acre Fund

\$188 – 252	Potential profit impact per hectare	62%	One Acre Fund farmers growing beans in Rwanda
2.3 tonnes per hectare (t/ha)	Highest measured yield from improved varieties	14%	One Acre Fund farmers growing improved varieties in the 2015A season in Rwanda

Context and Trial Rationale

- Beans are one of the most important crops in Rwanda. 62 percent of One Acre Fund farmers grew climbing beans in 2014A, and 49 percent grew bush beans, with a total average of 0.1 hectares under beans for those who cultivated.
- Fortified beans are an effective way to address iron deficiency in Rwanda.

Major Intervention Configurations

- **New Varieties:** One Acre Fund worked with RAB (the Rwandan Agricultural Board) and Harvest Plus (a program of the CGIAR) to identify the most promising bush and climbing bean varieties for One Acre Fund areas of operation.
- **Inputs:** Trials were conducted with one local bush bean control, four improved bush bean varieties, one local climbing bean control, and seven improved climbing bean varieties.
- **Test Configurations:**
 - 1) **Bush bean control:** Local bush bean seed, 40cm x 20cm spacing, 100 kg/ha DAP.
 - 2) **Improved bush bean:** Improved bush bean seed, 40cm x 20cm spacing, 100 kg/ha DAP.
 - 3) **Climbing bean control:** Local climbing bean seed, 40cm x 20cm spacing, 100 kg/ha DAP.

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- 4) **Improved climbing bean:** Improved climbing bean seed, 40cm x 20cm spacing, 100 kg/ha DAP.

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

Trial	Configuration	Location / Date	Yield (t/ha)	Profit (USD/ha)	Profit Change vs. Trial Control
1. Bush bean control: Local bush bean seed, 100 kg/ha DAP at planting, 125,000 plants per hectare	128 farmers	Rwanda, 2014A	1.7	\$627	\$0
2. Improved bush bean: Four varieties of improved bush bean seed, 100 kg/ha DAP at planting, 125,000 plants per hectare	261 farmers	Rwanda, 2014A	1.4 – 2.3	\$529 - \$882	-\$101 - \$252
3. Climbing bean control: Local climbing bean seed, 100 kg/ha DAP at planting, 125,000 plants per hectare	174 farmers	Rwanda, 2014A	2.1	\$818	\$0
4. Improved climbing bean: Seven varieties of improved climbing bean seed, 100 kg/ha DAP at planting, 125,000 plants per hectare	351 farmers	Rwanda, 2014A	1.3 – 2.3	\$343 - \$1,005	-\$474 - \$188

B. Farmer Adoption: *High Adoptability*

- Farmer Preference:
 - Preference for the improved varieties varied by bean type (i.e. bush vs. climbing) and by variety. Farmers perceived the local bush bean variety to be inferior to the improved varieties. However, farmer perception of the benefits of the improved climbing bean variety relative to the local climbing variety was minimal. This suggests that perceived improvements are greater for bush beans than climbing beans. Unfortunately, neither of the most preferred bush or climbing bean varieties were the iron-rich variety.
- Purchase Behavior:
 - For the 2015A season (which starts in October 2014), 14 percent of farmers purchased bean seed in the four districts in which it was offered. Of the 3,100 farmers who took bean seed, 60 percent opted for bush bean and 40 percent for climbing bean. This was expected to be the case in spite of higher climbing bean yields given the shorter maturity and easier management associated with bush bean.

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C. Operability at Scale: *Medium Operability*

- Production of quality bean seed can be a challenge. Successful distribution of improved varieties at scale will require effective forecasting of seed demand from season to season.

Next Steps

In the future, One Acre Fund will:

- 1) Continue to run research station and farmer-level trials to evaluate new, potentially scalable offerings.
- 2) Offer improved bush and climbing bean seed to 3,100 farmers and evaluate performance.
- 3) Scale the offering of improved varieties that have performed well in the initial offering.