

Farmers First

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

Annually, Rwandans consume 125 kilograms (kg) of potatoes per capita. In the 2014 A season, 15 percent of One Acre Fund farmers grew potatoes on an average of a one tenth of a hectare (ha). The government of Rwanda encourages fertilizer use for crops like potatoes by subsidizing fertilizer prices. Subsequently, fertilizer use with potatoes is high countrywide, with almost 58 percent of farmers applying fertilizer to their potatoes. Previous One Acre Fund research showed that applying NPKⁱ fertilizer at the rate of 300 kg/ha significantly increased potato yields. One Acre Fund experimented with lower fertilizer application rates in an effort to increase the profitability of potato cultivation.



Evariste Bagambiki/One Acre Fund

No change	Average profit impact per farmer*	74%	Farmer preference for lower fertilizer application method
50%	Reduction in potato fertilizer use without lowering yields	100%	Planting method compliance

*Measured differences were insignificant at p=0.1 level. See Yield and Results table below.

Context and Trial Rationale

- Potatoes are a popular crop among Rwandan farmers and have been targeted specifically by the Government of Rwanda for fertilizer support.
- Having shown that 300 kg/ha of NPK 17-17-17 fertilizer effectively increases potato yields, One Acre Fund wanted to assess if higher profits can be gained through lower fertilizer application rates.

Major Intervention Configurations

- **Fertilizer Application Rates:** One Acre Fund trialed a lower fertilizer application rate of 150 kg/ha NPK relative to the previously trialed fertilizer rate of 300 kg/ha NPK. Farmers in the test region also apply lime to their soils to counteract the low native pH levels. Farmers were not instructed to apply set amounts of lime to their plots, but had to apply the same quantities to both control and treatment plots.

ⁱ Nitrogen Phosphate Potassium.

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- Configurations:

- 1) **Control:** Farmers growing potatoes with a higher NPK fertilizer application rate (300 kg/ha NPK). Plants were spaced at 60 x 40 cm. Other inputs, including lime, were kept consistent between plots.
- 2) **Lower fertilizer rate:** Farmers growing potatoes with a lower NPK fertilizer application rate (150 kg/ha NPK). Plants were spaced at 60 x 40 cm. Other inputs, including lime, were kept consistent between plots.

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. Control: 300 kg/ha NPK 17-17-17 + Lime	19 Farmers	Western Rwanda 2014 A Season	7.8	\$1,556	N/A
2. Lower fertilizer rate: 150 kg/ha NPK 17-17-17 + Lime	19 Farmers	Western Rwanda 2014 A Season	6.9*	\$1,460	No change*

*Measured differences were insignificant at the p=0.1 level.

B. Farmer Adoption: High Adoptability

- **Compliance:** Farmers complied fully with the planting technique. Field officers were present during each growing stage to advise on and monitor compliance. Qualitative feedback from the field additionally confirms that farmers found the techniques easy to learn and adopt.
- **Purchase Behavior:** In the subsequent 2014 B season, an estimated 6,114 client used NPK 17-17-17 fertilizer to grow potatoes. This reflects 10.8% of 2014 B season One Acre Fund farmers in Rwanda. Adoption estimates for the 2015 A planting season project that 5,027 farmers are growing potatoes using NPK 17-17-17.

C. Operability at Scale: High Operability

One Acre Fund does not anticipate any major obstacles to offering NPK fertilizer recommendations at scale. One Acre Fund is already distributing NPK fertilizer in large quantities and farmers are familiar with NPK uses and application techniques.

Next Steps

In 2015, One Acre Fund will:

- 1) Evaluate new potato varieties and fertilizer combinations to determine optimal arrangements for farmers
- 2) Evaluate biological and chemical control options for the primary potato bacterial diseases, which are another constraint to potato yields.