

Farmers First

PHASE:	(1) Research Station	(2) 50 – 500 Farmers	(3) 500 – 20,000 Farmers	(4) Full Scale
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Introduction

Irish potatoes are a common crop in upper altitude regions of Burundi, where yields have a maximum potential of 25-35 tons per hectare. Due to continuous replanting without crop rotation, Irish potatoes in Burundi are highly susceptible to bacterial wilt and fungal late blight, which leads to average yields of around 5 tons per hectare, far below maximum potential. However, the profit potential for this crop is very high, in spite of disease risks, as farmers can find good market prices for potatoes. Most farmers lack the materials or training necessary to protect their potatoes from disease.



Photo: Potato field affected by late blight

In this trial, we aimed to assess whether potato yields might increase from the application of Mancozeb fungicide to control late blight. This data was used to evaluate the potential impact of helping farmers gain access to fungicides.

+ 1.61 t/ha (+ 31.6%)	Significant yield increase with use of Mancozeb	\$ 4.09	Impact per adopter
68	Farmers participating in the research	50,000	Number of farmers who may benefit from this trial

Objectives

- To determine potato yield with the use of Mancozeb compared with normal farmer practices.
- To determine profitability of using chemicals prophylactically to grow potatoes.

Hypotheses

- Regular Mancozeb application will substantially reduce late blight infection of Irish potatoes, resulting in an increase in potato yields and higher incomes for farmers in Muramvya, Rutegama, and Mbuye districts.

Methodology

One Acre Fund District(s): Muramvya, Rutegama and Mbuye districts.

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One Acre Fund Site(s): 17 sites (4 farmers per site)

OAF District	Site name	OAF District	Site name
MURAMVYA	Gatwaro	RUTEGAMA	Kaguhu
	Mirinzi		Cumba
	Nyagisozi		Munanira
	Kiganda		Bubanda
	Busangana		Nyarukere
	Rweteto	MBUYE	Teka
	Biganda		Nete
	Busimba		Buhangura
			Mwegera

Description of treatments and controls:

Clients planted two side-by-side trial plots of local potato varieties during the B season (from February to June 2016), using One Acre Fund planting practices.

The sizes of the plot were 5 meters by 5 meters (25m²). The row spacing was 60cm, and the plant spacing was 40cm. NPK was applied during planting at 0.75kg per plot and 1.5kg total. Plots were weeded once and mounded per planting guidelines. The compost quantity and application method was dependent on the compost moisture content and quality, but it was 30kg per plot on average.

- For the control plot, farmers used whatever pest control methods they chose.
- For the treatment plot, Innovation Officers applied Mancozeb to potatoes every 10 days or after large rain events.

Innovation Officers received training on Mancozeb applications using sprayers and safety equipment. The dosage was 15g of Mancozeb for 5 liters of water for 100m².

Experimental design:

- Side-by-side plot trials of local potatoes with and without Mancozeb application.
- Total plot size of 50m² (25m² for treatment and 25m² for control).

Variables measured:

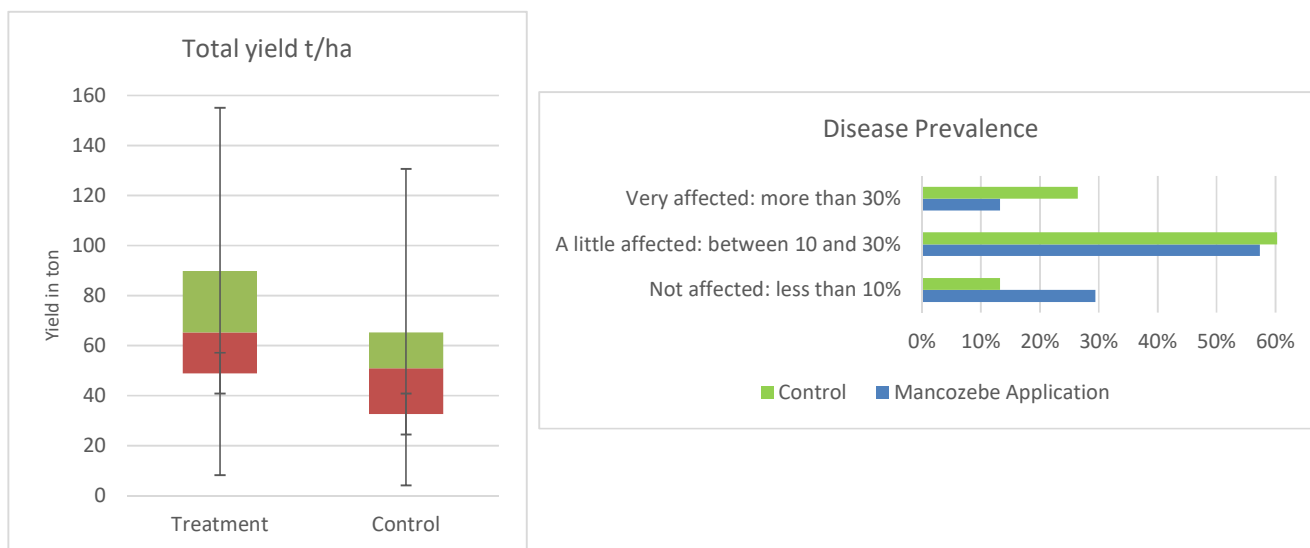
- Yield of potatoes (kg/12.25m² harvest box)
- Disease pressure and pesticide application
- Field preference

Results

Treatment	N	Yield (vs control %)		Profit (vs control)		Farmer preference
		T/ha	Kg/100m ²	USD/ha	USD/100m ²	
Mancozeb application	68	6.71 (+31.6%)	67.07 (+31.6%)	\$2,140 (+24%)	\$21.4 (+24%)	91%
Control	68	5.10	50.99	\$1,730	\$17.30	9%

p-value = 1.06E-12

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Interpretation and Discussion

We found highly significant differences in yields. Mancozeb application increased yield by 1.61 t/ha, with an impact of \$4.09 per adopter. Control fields were slightly more affected by disease. 26% were very affected, compared with 13% for the fields with Mancozeb application.

The large majority of the participants preferred the field with Mancozeb application over the control field (91% compared to 9%). 76% of the farmers were willing to buy Mancozeb from One Acre Fund at 3,800 Burundian Francs (US\$2.30). Thus, the potential adoptability of Mancozeb is very high for farmers who plant potatoes.

One Acre Fund wants to encourage the sustainable use of chemicals on crops that face high disease pressure, resulting in low yields and incomes.

Next Steps

Following on the results of this trial, One Acre Fund is planning to pursue the following next steps:

- A survey of the availability of chemicals and sprayers to assess the quantity and quality of available products. This monthly survey began in August 2016 and will end in July 2017.
- A phase 2 on-farm trial of sprayer distribution in 2017B.
- A phase 2 on-farm trial of different potato varieties with Mancozeb application in 2017A.
- A phase 3 on-farm trial of potato distribution to half of one district in 2017A and two districts in 2018A.
- Potential trial sales of fungicide to farmers in 2018A.

References

- **Maximum potential yield:** Institut des Sciences Agronomiques du Burundi (2012). *Catalogue des Espèces et Variétés vivrières sélectionnées par l'ISABU* (pp. 83-90). Bujumbura: MEX.
- **Mancozeb application rate:** Ag-Chem Africa (January 2004). *Mancozeb 800 WP*. Retrieved from <http://www.agchem.co.za/labels/Mancozeb%20Label.pdf>