Kenya | 2016 Long Rains | Maize MLND Variety Test

ONE ACRE FUND

Farmers First

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

Introduction

Maize Lethal Necrosis Disease (MLND) is a disease resulting from the combination of Maize Chlorotic Mottle Virus (MCMV) and a potyvirus. MLND is typically spread by thrips, aphids, and some infected certified seeds; it can reside in the soil after infection as well. This quick spreading disease destroys maize plants and can greatly reduce yields. Recent surveys indicate that MLND could affect 28% of One Acre Fund farmers in Kenya.

While there is some potential to control the vectors that spread MLND, the complexity for implementing these control measures can be a barrier at scale. However, many seed suppliers have been working on breeding MLND resistance into commercial maize seeds. These commercially available varieties could play a role in mitigating the impact of MLND on One Acre Fund farmers; all that would be required is simply offering the variety in areas affected by MLND. Still, these varieties must be proven to perform well in the presence of MLND.

3.85 t/ha	**Yield of DK 777 with presence of MLND**
1.57 t/ha	**Yield of current OAF program variety**
+$333	**Increased profit per hectare with DK 777**
28%	**Estimated percent of OAF farmers affected by MLND in Kenya**

Objectives

- Evaluate a potential MLND resistant variety for performance against a currently offered maize variety in the presence of MLND.

Hypotheses

- DK 777 is more resistant to MLND compared with the control variety as evidenced through increased yield of DK 777 in the presence of MLND.

Methodology

One Acre Fund Research Station: Gucha-Kisii Crop Research Station

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Agroecological Parameters:

Altitude	Mean Annual Rainfall	Mean Annual Temperature
1,750 masl	1900 mm	20.3˚C

Treatments:

1. **Program Control:** Variety WE 1101, planting fertilizer 123.5 kg/ha DAP, top dress fertilizer 123.5 kg/ha CAN, plant spacing 25 cm, row spacing 75 cm, weeding 2 times

2. **MLND Resistant Variety:** Variety DK 777, planting fertilizer 123.5 kg/ha DAP, top dress fertilizer 123.5 kg/ha CAN, plant spacing 25 cm, row spacing 75 cm, weeding 2 times

Experimental design: Randomized complete block design, with 6 replicates

Variables Measured: Grain yield, MLND presence

Results

Treatment	Yield t/ha (vs control %)	Profit USD/ha (vs control)
DK 777	3.85 (+145%)	$467 (+246%)
Control	1.57	$135

p = 0.003

Interpretation and Discussion

DK 777 had higher yields compared with the One Acre Fund program control variety. While this study was only completed over a single growing season, laboratory results confirmed the presence of MLND in the treatment and control plots.

Treatment	Plots with MCMV (%)	Plots with potyvirus (%)	Plots with MLND (%)
DK 777	100%	33%	33%
Control	100%	33%	33%

Next Steps

DK 777 should be moved to Phase 2 farmer field trials in areas with high MLND presence. The aim of these trials should be to verify performance of DK 777 at various levels of MLND as well as to determine farmer preference and potential adoption of the variety.