



Soil health: Legume Best Bets 2009-2017

START HERE

"The good thing about planting legumes is that you don't apply fertiliser when you rotate with maize. This is helping us save on inputs"

Traditional soil management systems based on shifting agriculture no longer viable due to land pressure

Declining soil health due to **continual maize production** has led to **low farm productivity (400-100 kg/ ha)**. Individual land holdings are small and in many areas only one crop can be grown per year, which leads to **lack of dietary diversity**. The incidence of stunting in children under five years of age averages 46%.

Sisiwe Luhana with her maize crop grown after groundnut and applying 24 kg N/ha of inorganic nitrogen fertilize

Farmer training on basics of soil fertility principles

- 2009-2012: Innovative extension includes:
- **Nutrition education** through recipe days
 - On-farm **adaptation** of **legume** varieties
 - **Residue management** practices
 - **Farmer-to-farmer** visits.

Contextualize and refine crop management options

2011: Mother baby trials at 2 sites showed:

- Adding a legume into a rotation + low dose of **inorganic nitrogen fertiliser** (24 kg N/ha) gave higher maize yields than a continuous sole cropped maize with a similar amount of fertiliser (between 2-2.5 t/ha vs 1.2-1.6)
- **Doubled up legume technology**, pigeonpea intercropped with soybean or groundnut and then rotated with maize, produced the **best returns to land and labour invested**.
- On **sandy soils** in Kasungu, the pigeonpea-groundnut intercrop **fixed 83 kg N/ha** compared to 56 kg N/ha and 54 kg N/ha for a sole crop of groundnut and pigeonpea, respectively.

Southern Africa Community of Practice



Farmers adapt options of their contexts

(2011) 80% of participating farmers said they are interested in **expanding double-up legume production** because it is **labor saving** and contributes to **diet diversification**.

Keep focus on marginalized farmers

Promoting equity through investments that favor the disadvantaged and vulnerable

2012-2015 focus on households of **expanding project** to households affected by **HIV-AIDS**, **collaborating** with Ekwendeni hospital Soils, Food and Healthy Communities initiative (SFHC)

Recognize heterogeneity

2014: Further research shows significant **variation in performance** of double up technology, ranging from **3 T of yield increment to none and even negative values**. It is known that soils with critically low levels of organic matter are **non-responsive**.

Farmer managed seed production and dissemination

(2012) 100 farmers in each of 2 sites participated in **seed multiplication** of pigeon pea and soya via a "**seed pay-back**" system organised by the project and village extension officers. Over 200 participating farmers grew enough to "pay back/pass along" pigeon pea, soya and groundnut seed to an additional 200+ new farmers.

Connect to other institutions and initiatives

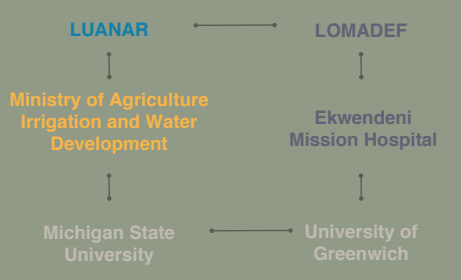
Institutions promote soil health

The **doubled-up legume** technology involving groundnut and pigeonpea is being **promoted** by the **Ministry of Agriculture Irrigation and Water Development**.

Generate farm typologies to better understand various agro-ecological and socio-economic contexts

The Multi-Environment Trials have always been done with lead farmers who have around 20 **farmer followers**, who take part in the trials (mother) and test technologies on their own farms (baby). Starting in 2015, a **FRN approach** is being explored. A **PhD student** has shown that Poor and Very Poor farmers participate more in a Farmer Field school format, followed by FRNs for Poor, which is also a **good option for Better-Off farmers and the least successful at including the Very-Poor**.

Project Partners



Legend for Project Partners:
 ■ Non-Governmental Organization (dark blue)
 ■ National Ag Research Center (light blue)
 ■ University outside of Region (grey)
 ■ Governmental Organization (orange)



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