

# Lessons from pilot trials with small-scale irrigated forage production in the Amhara Region: Potential of integrating the perennial forage Napier grass with Desmodium and Pigeon Pea in cropping systems

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# Introduction

- Perennial forages including Napier have high potential to provide year round green fodder for smallholders
- Napier is also compatible for intercropping with other perennial legumes
- However, during the long dry season, supplemental irrigation is needed for uninterrupted fodder production

# Objective

- A pilot trial was initiated in the Robit Bata kebele of Bahirdar zuria district of the Amhara region to
  - Assess the acceptability of irrigated Napier production by smallholder farmers
  - Explore the economic feasibility of the practice and the potentials to generate cash income and employment opportunity
  - Support diversification, intensification and sustainability of the crop-livestock system

# Approach

- The site - selected based on access to irrigation water and proximity to market
- Awareness creation through meetings and group discussions
- Selection and training of farmers who showed interest
- Initially 17 farmers were involved, which grew to 91 in the subsequent seasons



# Cont.

- Each farmer allocated 100m<sup>2</sup> plot of land initially , for Napier grass establishment
- Shallow wells and pulley system to lift water and irrigate the plots
- Napier grass subsequently intercropped with either Pigeon pea or Desmodium (Silver leaf)
- Irrigation - once to twice weekly depending on soil moisture
- Fodder quantity and quality measured



# Findings

- Napier could be harvested 6 to 9 times in 12 months
- Relative to a 12 month growing period, a minimum yield of 17.9 t/ha and a maximum of 23 t/ha dry matter were recorded
- Gross value at approximately 150 000 to 200 000 Birr per hectare at fodder markets

## Cont.

- Pigeon pea performed very well with Napier
- Synergy between Napier and pigeon pea
- Establishment of Desmodium slow, but showed good compatibility



## Cont.

### Positive effect of Pigeon pea (PP) intercropping with Napier

Forage	Average yield (t/ha/1 <sup>st</sup> cut)	Crude protein (%)	IVOMD (%)
Napier sole	3.27	8.3	49.1
Napier + PP 1 (early maturing)	4.88	12.5	51.2
Napier + PP 2 (late maturing)	4.34	11.5	51.3



## Cont.

- The yield of Napier increased by **50 and 33%** when intercropped with early and late maturing pigeon pea
- The intercropping also resulted in improvement in the fodder quality of Napier:
  - crude protein increased by **39-51%**
  - and *in vitro* digestibility **4.3-4.5%**

## Cont.

- The yield increases - a response to:
  - improvement in the physical soil structure due to hardpan penetration by the pigeon pea.
  - soil fertility improvement due to nitrogen fixation by the legume intercrop
- Increased yield data agree with maize intercropping where pigeon pea was used to tackle hard pan constraints

## Cont.

- Farmers and researchers evaluated the irrigated forage trial favorably
- Plot size increased from 100 to average of 200m<sup>2</sup> per farmer
- Number of participants increased from 17 to 91
- In some cases Khat plots were converted to Napier



# Conclusion

- The multiple role of livestock is a strong driver to the observed commitment of farmers to grow irrigated fodder
- Irrigated fodder production – a viable option for smallholders, with potentials as a source of income and employment

# Conclusion

- Irrigated fodder production can support the national agenda to enhance livestock productivity
- Intercropping Napier with legumes – good practice for farmers with marginal and limited land size to improve fodder quality and quantity

# Conclusion

- Forage for own use or sale in the local market:
  - Improved animals especially for dairy (crosses)
  - Work on fodder value chain, with attention to off-farm actors and activities
- Forage processing options for marketing and better utilization: green, hay, chopped, mashed

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