N2Africa - Putting nitrogen fixation to work for smallholder farmers in Africa

Grain legume crop-livestock integration in Ethiopian smallholder systems: The way forward

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WHAT IS THE PROBLEM?
- The Ethiopian small-holder crop-livestock system
  - comprises about 40% of the country’s land area,
  - involves nearly 90% of the human population and
  - 70-75% of the livestock population of the country.
- As an integral component, livestock provide:
  - inputs for crop production,
  - food and cash income
  - asset, wealth, security and investment
- Livestock productivity is low mainly due to
  - feed shortages and low N content of cereal crop residues specially during the dry season
- Improving the feed supply, both in yield and quality, build assets and improve whole farm productivity.

HOW CAN GRAIN LEGUME DEVELOPMENT IMPROVE LIVESTOCK PRODUCTIVITY?
- Select legume species/varieties that combine high grain and straw yields (Fig 1).
- Breed/selection of legume varieties
  - that tolerate leaf shattering towards maturity stage
  - suitable for integrating with cereals.
- Improve feed supply through
  - proper/timely harvesting, threshing and conservation of grain legume residues
- Improve palatability and digestibility of the whole basal diet for ruminants through
  - grain legume residue processing (chopping) and
  - optimizing of mixtures of legume and cereal residues
- Improve whole farm productivity and sustainability through better feeding and management of livestock and manure.

WHAT ARE THE MAJOR INTERACTIONS BETWEEN LIVESTOCK AND GRAIN LEGUMES?
- Between 40 and 60% of livestock diets are made up of crop residues in the Ethiopian small-holder systems.
- Use of grain legume residues as livestock feed is the major interactions between legumes and livestock production.
- Livestock provide
  - inputs (draught power, transport, and manure) for crop production,
  - important avenue for farm diversification.

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Fig 1. Relationship between seed yield and straw yield in common bean genotypes

y = 0.8096x + 170.7
R² = 0.75
(n=99)