Africa RISING in the Ethiopian Highlands

Sustainable intensification(SI) innovations driven by crop ecology: Africa RISING science, innovations and technologies with scaling potential from the Ethiopian Highlands

Kindu Mekonnen (ILRI), Melkamu Bezabih (ILRI), Peter Thorne (ILRI), Aberra Adie (ILRI) and Seid Ahmed (ICARDA)

Key messages

- Taking a broader systems perspective is imperative when introducing a new technology.
- Sing the terms 'improved' and 'weed' indiscriminately — and without properly understanding the multiple benefits farmers derive from cultivating their plots — can be highly misleading.
- Progressive experimentation, starting from the existing indigenous practice, leads ultimately to greater efficiency e.g. allocating land systematically to both grain and forage production enhance adoption and wider scaling.

Objectives and approach

1. To compare whole plot productivity of traditional and improved faba bean growing practices.
2. To examine the benefits of managing faba bean / forage intercrops to increase total plot productivity and produce quality forages.
    - Action research with farmers for *stepwise intensification;* comparing traditional and improved practices, screening competition tolerant varieties, intercropping selected faba bean varieties with improved forage crops.

Key results

- The traditional practice involved one late 'weeding' whereas improved management practice two 'weedings' which generated insignificant quantities of forage.
- Grain and straw yields were slightly higher under the improved than the traditional management practice and *vice versa* for forage biomass.
- The opportunity costs associated with the loss in weed biomass when the improved practices were adopted were not adequately offset by the economic gains from increased grain yield and crop residue biomass (VCR was less than 2).
- Intercropping appears to be economically feasible to provide both grain for the household and feed for the household's livestock (Fig 3).

Significance and scaling potential

- The pathway to successful intensification of the faba bean-based mixed farming system appears to revolve around choosing competition tolerant varieties of bean alongside forage combinations that optimize the production of grain for human consumption, feed for livestock whilst improving income generation and nutrition.
- The faba bean / forage intercropping intervention is scalable in the highland areas of the southern region of Ethiopia where the traditional practice is dominant and already accepted by the communities.

Fig 1. Comparison of traditional (A) Vs Improved (B) practices

Fig 2. Faba bean/ forage intercropping studies

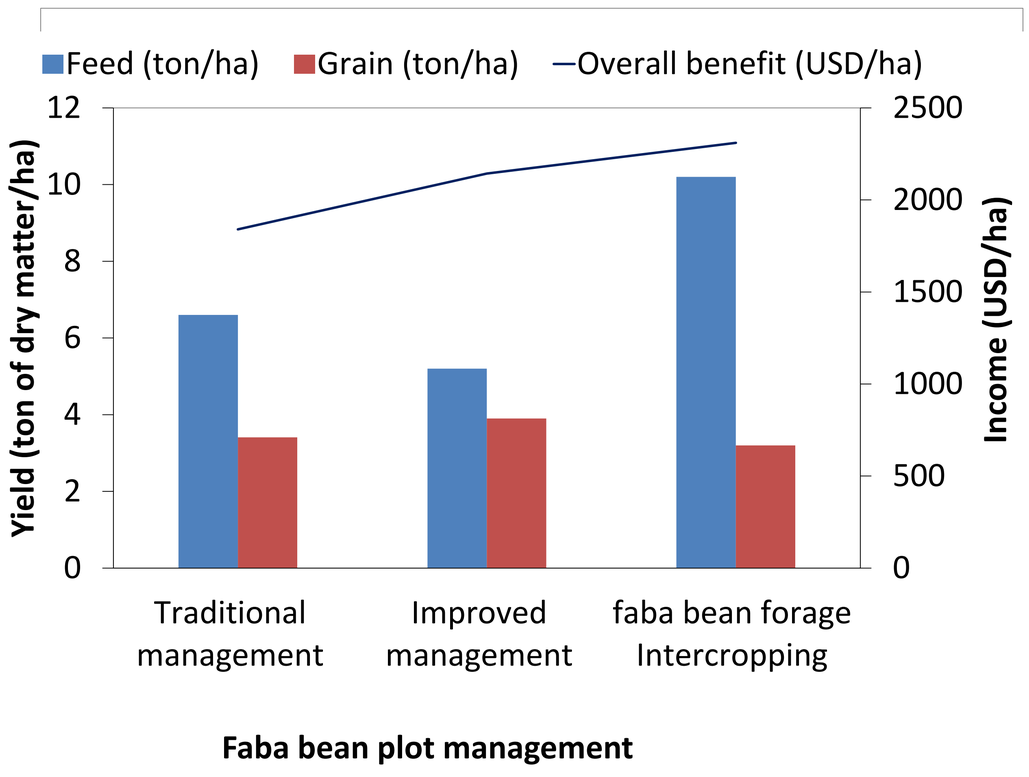

Fig 3. Grain and feed biomass yields, and economic gains associated with different management approaches

Core partners

ILRI, CIAT, ICRISAT, ICARDA, CIMMYT, IWMI, World Agroforestry Centre, IFPRI, EIAR, CIP

We thank farmers and local partners in Africa RISING sites for their contributions to this research. We also acknowledge the support of all donors which globally support the work of the CGIAR centers and their partners through their contributions to the CGIAR system

CGIAR, FEED THE FUTURE The U.S. Government's Global Hunger & Food Security Initiative, USAID FROM THE AMERICAN PEOPLE