FIGURE 1: LRNP SITES AND THE BEST BET LEGUMES FOR EACH SITE

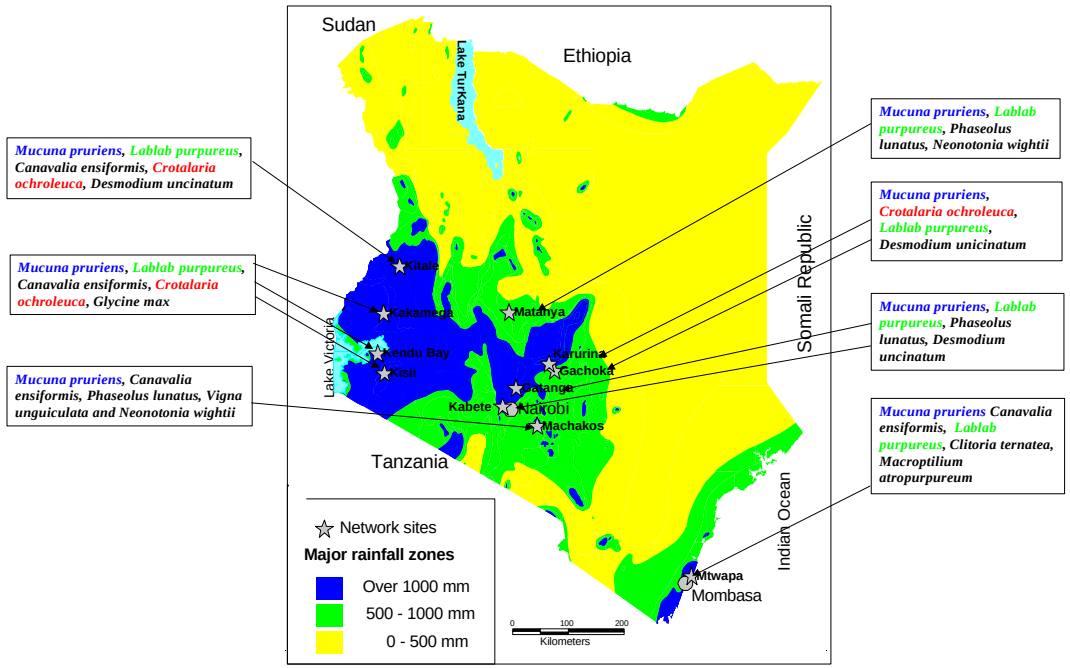
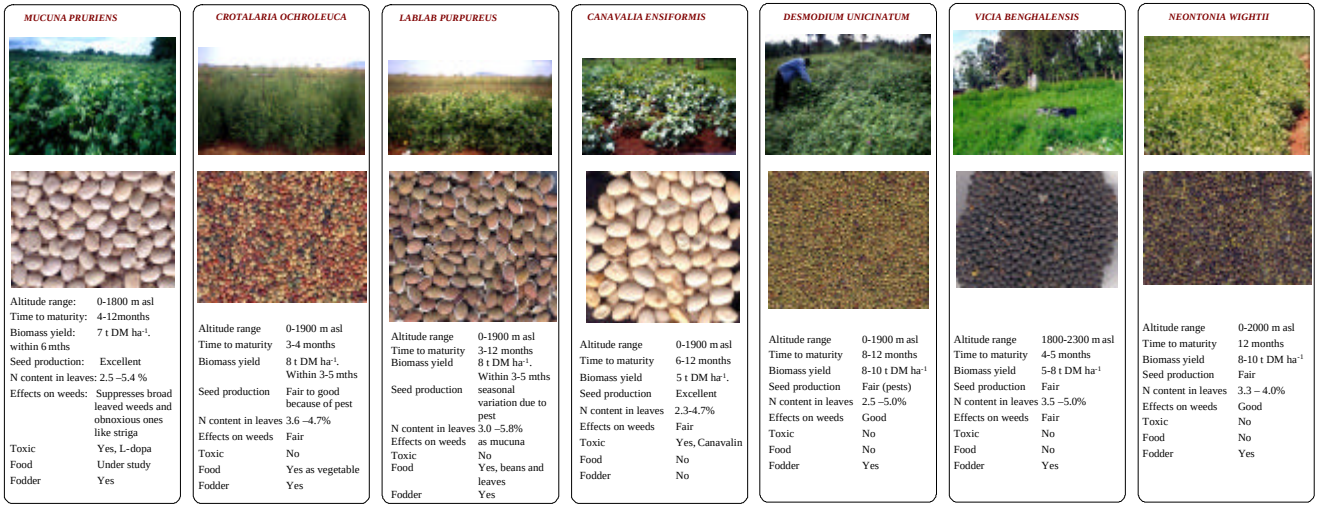


FIGURE 2: BEST BET GREEN MANURE LEGUME SPECIES



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LEGUME RESEARCH NETWORK PROJECT: A PROFILE

Background of the LRNP

Green manure legumes (GML) can play a major role in improving farm productivity in smallholder agriculture. Studies have shown that integrating green manure legumes into farming systems offers feasible options for maintaining and improving soil fertility in smallholder farming. GML have several advantages which include erosion control, improved soil productivity through increased soil organic matter content, improved soil physical and microbial properties, suppression of weeds and pests.

The LRNP was started in 1994 to evaluate and identify suitable GML species for soil fertility improvement in mixed farming areas of Kenya. About 40 species were screened in different agro-ecological zones (AEZ) of Kenya, among them food legumes, forage and green manuring species. To date, the LRNP has identified several potential solutions for improving land productivity at farm level using GML. Network activities cover research on legume residue management for soil fertility improvement and soil moisture conservation, INM and use of GML for human food and livestock feed. Table 1 and Figure 1 show the LRNP sites and the best bets for each site. Figure 2 shows some of the best bet legume species and their characteristics.

Network goal

Improve smallholder agriculture by developing low-cost and sustainable technologies for increasing soil fertility, crop production and thus contributing to food security of the Kenyan rural communities.

Table 1: Characteristics of LRNP sites

Site name	Elevation (masl)	Annual rainfall (mm)	Soil type
Machakos	1600	750	Luvisol
Kabete	1700	1000	Nitisol
Gatanga	1500	1100	Nitisol
Kitale	1890	1000-1200	Ferralsol
Kakamega	1560	1800-2000	Nitisol
Karurina	1280	1100	Nitisol
Gachoka	1070	950	Ferralsol
Kendu Bay	1190	1130	Vertisol/Ferralsol
Mtwapa	15	1200	Acrisol/luvisol
Kisii	1750	2000	Nitisol
Matanya	1842	600	Vertic Luvisols

Network objectives

Identify suitable GML species for the different AEZ of Kenya.

- Develop GML technologies for soil fertility improvement in smallholder agriculture in Kenya.
- Develop methods for utilizing GML for human food and livestock feed.
- Identify niches for GML technologies in Kenya.
- Assess trade-offs of using GML either for human food needs, livestock needs and soil fertility improvement.
- Disseminate GML technologies.

Achievements

GML database: LRNP has accumulated a lot of information for the best bets GML species for different AEZ of Kenya. This information is being organized into a database that will include among others, the following: screening sites, site characteristics, best bets for each site and for the different AEZ's, germination, ground cover, nodulation, phenology, tissue analysis and dry matter yields.

GML technologies: The Network has developed technologies for incorporating GML into smallholder farms. On-farm studies have shown that GML have the potential of improving soil fertility, suppressing obnoxious weeds, controlling soil erosion and increasing crop yields. Incorporating GML residue in the soil increased maize grain yield by 40 to 120% compared with the control in most of the LRNP sites.

The increases were attributed to soil fertility and moisture conservation where in the latter case the GML was left as surface mulch under semi arid conditions. Results from South Nyanza showed that plots where the legumes were planted had on average 10 striga counts per m^2 while the control had 32 striga counts per m^2.

Erosion studies in central Kenya highlands indicated that GML reduced soil loss by three fold compared to bare plots.

Utilization: Studies in Mtwapa, Katumani and Naivasha showed improved performance on milk production and weight gain when cattle and goats were fed on GML forage. The LRNP is currently undertaking studies aimed at identifying cheaper and acceptable methods for processing GML seeds for human consumption.

Dissemination of GML technologies: These are being disseminated in form of practical manuals, field days, demonstration trials, farmer field schools, journal articles, proceedings and Network communication.

LRNP Newsletter: LRNP has a biannual newsletter in which some of the information is disseminated to relevant stakeholders. The first issue was published in June 1999. The newsletter provides a forum for highlighting network activities and for sharing research findings with network members, individual researchers and farmers who are involved in legume research within and outside Kenya. Most of the issues are available at LRNP co-ordination office.

Seeds: The Network bulks best bet legume seeds in each of its sites. The seeds are stored at NARL seed store and can be supplied at a nominal fee to recover production costs. Demand for seed is great and the network is trying as much as possible to meet this demand.

Network membership

Members are mainly from Kenya Agricultural Research Institute (KARI), University of Nairobi, Community Mobilization Against Dessertification (C-MAD), Environmental Action Team (EAT) and Ministry of Agriculture & Rural Development (MoARD).

Regional and International collaboration

It is the Networks aim to share experiences among scientists and other institutions doing similar work in both developed and developing countries. The Network collaborates with Kenyan public universities, several NGOs in Kenya (e.g C-MAD, EAT), MoARD, many KARI centres, SSSEA, among others. Efforts are being made to seek collaboration with the following institutions: ICRAF- Maseno, CIAT - Uganda, RELMA, TSBF, AfNet, Soil Fert Net, Sokoine University and CIEPCA in IITA. Through seed distribution, the Network has initiated collaboration with Del Monte and DWA who are using GML as cover crops in pineapple and sisal plantations, respectively. This however, does not limit collaboration with other interested individuals and organisations.

Source of funding

Since its inception, the LRNP has been funded by the Rockefeller Foundation and the Kenya Agricultural Research Institute.

Location

The LRNP co-ordination offices are located at National Agricultural Research Laboratories, KARI, along Waiyaki Way.