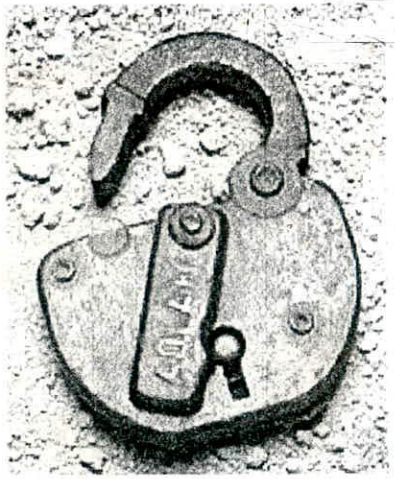


BEAN RESEARCH AND DEVELOPMENT PROGRAM

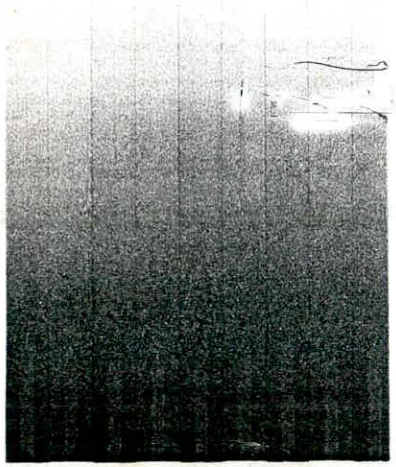


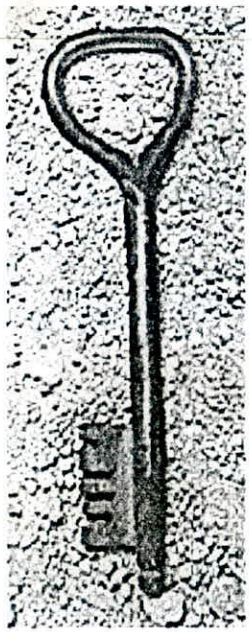
NTIONAL AGRICULTURAL RESEARCH ORGANIZATION (NARO)

NATIONAL AGRICULTURAL AND ANIMAL PRODUCTION RESEARCH INSTITUTE

P.O. BOX 7084, KAMPALA

UGANDA

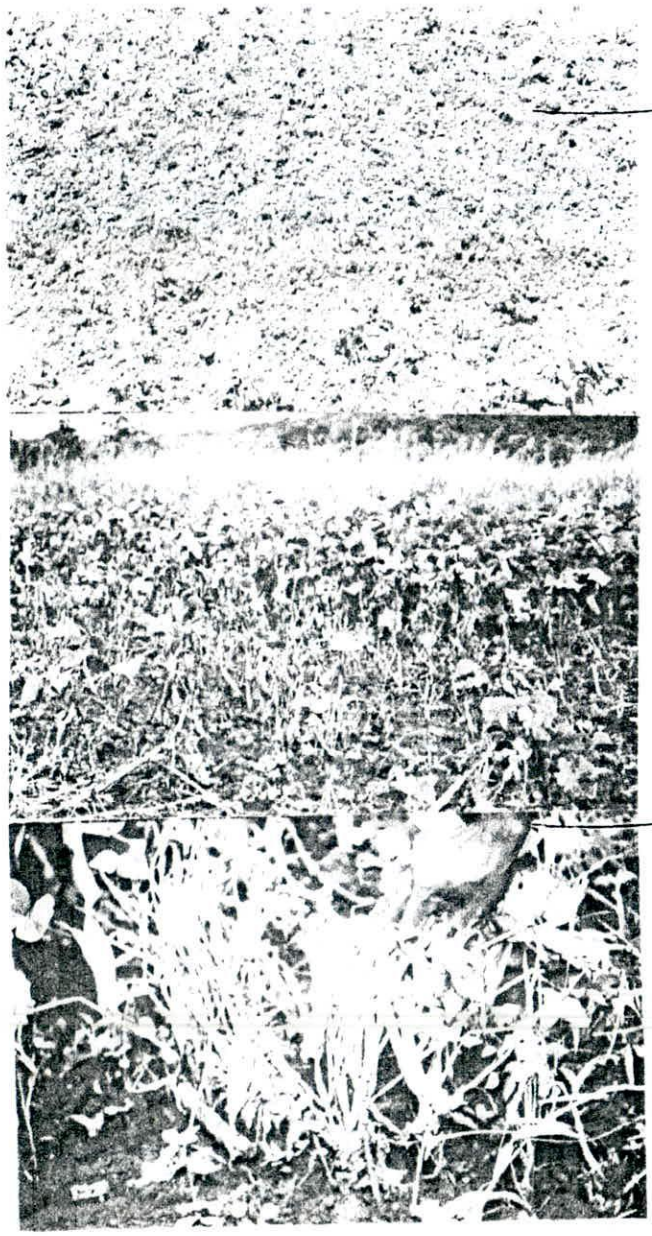




INTRODUCTION

- Research began in the 60's - malnutrition
- Important source of protein (45% intake) and calories (25% intake)
- Also important sources of vitamin B complex, iron, zinc, folic acids and complex carbohydrates
- 500,000 – 600,000 ha grown annually
- Yield up to 300,000 – 400,000 MT
- Yield at farm level – 700 kg/ha (local cultivars) compared to improved varieties – over 1.5 tons/ha

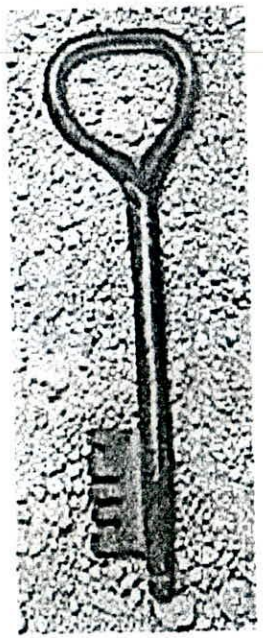
Constraints to Increased Bean Production



- Production Constraints
  - Diseases – root rots, anthracnose, ALS, CBB, BCMV
  - Insect pests – bean stem maggots, aphids, beetles, pod borers, bruchids
  - Poor soil fertility management and inefficient agronomic practices
  - Use of low-yielding varieties by farmers (lack of access to suitable and high-yielding varieties)
  - The effects of drought and other weather-related issues
  - Limited use of improved bean seeds
  - Limited affordability of non-seed inputs
  - Limited dissemination of bean-based technologies

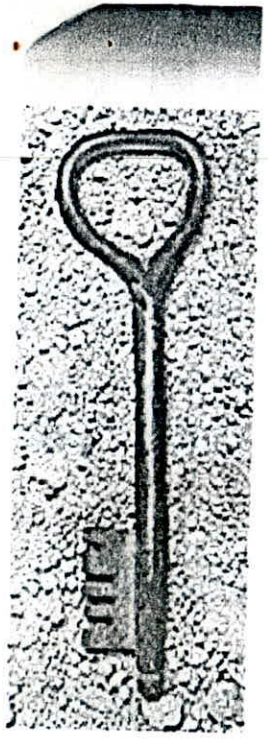
Constraints continued

- Processing, consumption and utilization constraints
  - Poor post harvest handling and storage facilities (high processing losses)
  - Inadequate use of processed products
  - Inadequate availability of processed products
  - Available bean supply are lower than demand
- Marketing constraints
  - Lack of market and trade information (poor market linkages/inadequate market research)
  - Limited access to information channels
  - Limited product differentiation
  - Narrow processed bean product range
  - Large fluctuation in bean prices
  - High distribution costs
  - Poor packaging of bean products
  - Mismatch between supply and demand



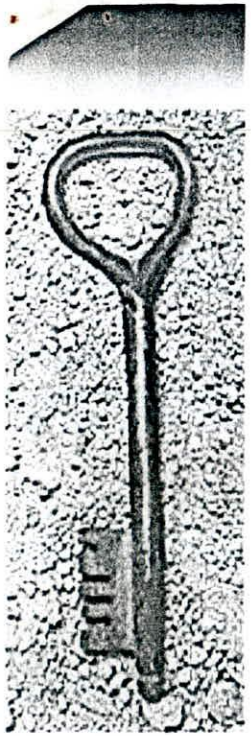
GOAL AND PURPOSE

- Increase bean productivity through the use of improved bean production technologies thereby improving on food security and income of the population hence contributing to alleviation of poverty from resource poor farmers while conserving the natural resource base.
- Make available appropriate improved bean production technologies to end users through uptake pathways in order to increase bean productivity



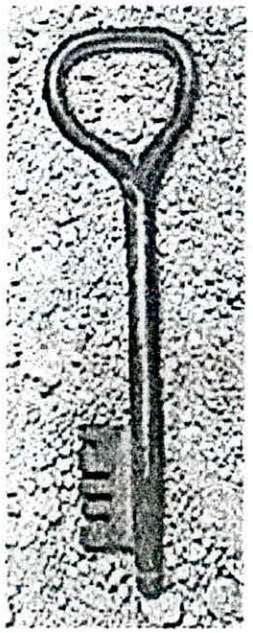
RESEARCH OBJECTIVES

- Varietal improvement for yield and quality
- Development of affordable and environmentally friendly methods for diseases, insect pests and weed management
- Development of efficient agronomic practices and soil fertility amendments affordable by farmers
- Identify and integrate socioeconomic variables in bean technology generation
- Development of post harvest technologies that enhance the shelf life and or product quality and values
- Ensure effective technology transfer through multidisciplinary/interdisciplinary approach



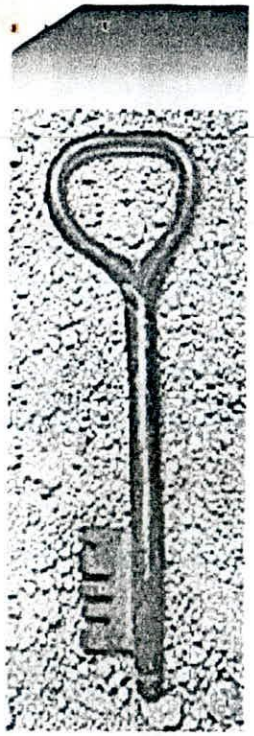
CROP IMPROVEMENT

- Germplasm collection, characterization, and evaluation
- Introductions – bush and climbing beans
- Hybridization/crossing program
- Development of multiple constraint resistant lines
- Maintenance breeding
- Breeding red mottle beans
- Yield trials
  - Preliminary Yield Trial
  - Intermediate Yield Trial
  - Advance Yield Trail
- Participatory plant breeding
- On-farm trails



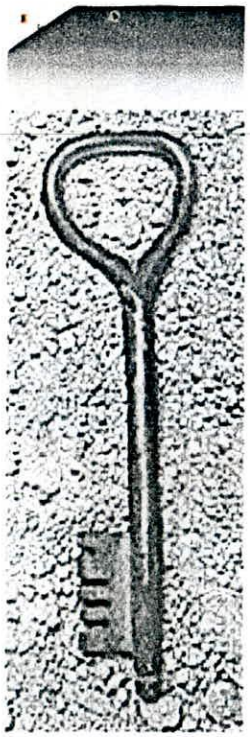
INTEGRATED DISEASE/PEST MANAGEMENT

- Yield loss trials - anthracnose, root rot, ALS, BCMV
- Epidemiology studies - Root rots, anthracnose, ALS
- Management – resistant lines, soil fertility management, crop rotation, etc
- Disease nurseries – Root rots, ALS



CROP MANAGEMENT

- Nutrient use efficiency in bean based system – P
- BILFA – Bean improvement for low fertility in Africa
- Climbing bean/maize intercropping trials
- Soil fertility management in relation to disease development
- Cropping system management



TECHNOLOGY TRANSFER AND SOCIOECONOMIC STUDIES

- Seed production – foundation seeds and community-based seed production
- Promotion and transfer of improved bean production technologies
- Adoption and impact studies
- Bean consumption preferences
- Surveys



ACHIEVEMENTS

- Release of 9 bush beans and 5 climbing bean varieties
- Resistant sources to important diseases identified namely CBB, BCMV, HB
- Varieties tolerant to poor soil conditions identified
- Agronomic practices – recommendation on the use of green manure
- Integrated disease management
- Yield loss assessments
- Mode of transmission and survival of organisms causing CBB and BCMV established

Collaboration

- Farmers – main clients/ partners
- International Research Centers – CIAT, TSBF
- International Institutes – National Horticultural Research
- ECABREN Member counties
- Universities – MUK, University of Nairobi
- Sister NARO Institutes and ARDCs
- NAADS and other district extension agents
- District local leaders
- NGOs/CBOs
- Exporters and importers
- Seed producers (seed companies, community-based seed producers)

Conclusion

- Develop farmer-acceptable bean production technologies which will result in:
  - Higher yield per unit area (improved food security)
  - More income for women and children (empowerment of women through income generation)
  - Meet home consumption needs (improved nutrition)
  - Meet domestic and export market demands (improved income)
  - Protected the environment
  - Therefore, contribute to poverty alleviation and improved livelihoods of the people of Uganda