



HIGHLIGHT OF BEAN RESEARCH IN GHANA-2013

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Outline of Presentation

- Introduction
- Evaluation of exotic germplasm for yield, adaptation and other desirable traits
- Cropping systems research
- ISFWM options
- On-farm evaluation
- Seed multiplication
- Niche market Bean varieties
- Looking Ahead

Major season

- Two beans trials were established at Fumesua.
- These were canning beans trials and
- Multiple constraint beans
- Seed multiplication

Methodology

- Canning and Multiple constraint beans made up of twenty (20) lines each.
- Design-RCBD
- Replications -2
- Number of rows per plot: 2.
- Plot length 4m
- Spacing of 40cm x 20cm.

Data collected

- Days to emergence
- Days to First flower
- Days 50% flowering
- Days to maturity,
- 100 seed weight,
- pod weight, pod yield
- shelling percentage
- Disease incidence and score

Results

Table 1: Performance of Canning Trials

Entries	Days to first flower	Days 50% flowering	Days to maturity	Seed yield (kg/ha)	Shelling percentage	100 seed weight (g)
Range	31-40	37-46	61-74	107-908	45-76	17-26
Mean	35	40	71	443	65	21
SED	1.83*	2.18	2.64	184.1*	0.10	0.40

Table 2: Performance of Multiple Constraint Trial

Entries	Days to first flower	Days 50% flowering	Days to maturity	Seed yield (kg/ha)	Shelling percentage	100 seed weight (g)
Range	38-40	33-46	56-76	77-942	37-80	21-29
Mean	33	37	67	360	65	25
SED	1.83*	2.18	2.64	184.1*	0.10	0.40

Minor season

Environmental friendly ISFWM options

- Organic manure in association with inorganic fertilizers

Bean fertilizer Trial

- Objective: To determine the response of beans to organic and inorganic fertilizer application

Methodology

- Design: Split-split plot
- Main Plots: Poultry manure and no manure (4 tons/ha, 0)
- Sub-plots: Inorganic fertilizer levels (0, 30 kg/ha NPK)
- Sub-sub plots: 4 Bean lines

Evaluation of bean varieties under various cropping systems

Maize/bean intercrop



Methodology

- ❖ Number of bean accessions: 4
- ❖ Number of maize -1 (early maturing variety)
- ❖ Spacing:
 - ✓ Sole maize -80 cm x 20 cm (1 seed per hill)
 - ✓ Sole bean – 60 cm x 20 cm (2 seeds per hill)
 - ✓ Intercrop: 2 rows of maize followed by 2 rows of beans spaced 50cm apart

M___M___B___B___M___M___B___B

- ❖ Plot length: 5 metres
- ❖ Sole maize population: 62,500 plants/ha
- ❖ Sole bean: 166,666 plant/ha
- ❖ Intercrop maize: 50,000 plant/ha
- ❖ Intercrop bean: 100,000 plants/ha
- ❖ Number of reps: 3

Ethiopian Drought Canning Beans Trial

Objectives:

- To evaluate canning bean lines for resistance to multiple stresses and select adapted lines for further testing on farmers' field.
- To increase seed of canning bean lines resistant to multiple-stresses

Methodology

- ❖ 16 accessions
- ❖ Design: 4 x4 Lattice square
- ❖ 4 row plots
- ❖ 5 metres long
- ❖ Spacing 40 cm x 20 cm
- ❖ 3 reps/site

Tolerance to multiple stresses Trial

Objectives:

- To evaluate bean lines for resistance to multiple stresses and select adapted lines for further testing on farmers' field.
- To increase seed of bean lines resistant to multiple-stresses

Methodology

- ❖ 16 accessions
- ❖ Design: 4 x4 Lattice squares
- ❖ 4 row plots
- ❖ 5 metres long
- ❖ Spacing 40 cm x 20 cm
- ❖ 3 reps/site

Lima beans

- 30 local accessions were evaluated for grain yield and their reaction to diseases and pests

Lima bean Research

- Assessment of Nutritional quality
- Evaluation of accessions for yield and stress resistance
- **New Research Area?**
- Industrialist looking for minor legume
- Little or no competition with humans to develop animal feed
- High yield
- Low cost of production

Methodology

- Relay intercropping of lima bean with yam
- Yam will be planted first
- Lima bean will be introduced a month before harvest and benefit from stakes used by yam

On-farm evaluation

- Canning bean Trial
- Objective: To evaluate best bet bean lines on farmers fields for selection for release

Methodology

- ❖ 4 accessions evaluated at 6 locations
- ❖ Design: RCBD
- ❖ 4 row plots
- ❖ 4 metres long
- ❖ Spacing 40 cm x 20 cm
- ❖ 2 reps/site

Niche Market Bean Varieties

- 12 Snap Bean Accessions From Rwanda Through PABRA
- Observation Nursery was established during the off season
- Bush and climbing types
- Some are susceptible to Diseases
- Pod Colours: Yellowish green and green

Snap bean nursery

Bush types



Climbing types



Observation nursery trial of small white large beans

- 142 Accession received from Uganda
- Adapted lines will be advanced

Seed multiplication

- Small white beans are preferred in Ghana
- Seeds were multiplied
- Other accessions were also multiplied



Seed multiplication during off season



Agriculture shows

- To sensitize stakeholders on technologies developed by the institute
- Field days



Awareness Creation



CAPACITY BUILDING

- Gender mainstreaming of PABRA activities at CSIR-CRI
- Scientists and Technical staff were trained
- Multi-disciplinary team



Looking ahead

- Continue with on-station on-farm evaluations
- Seed multiplication
- Product development
- Hybridization program

Hybridization program



Trainee carrying out crossing in beans at Kawanda, Uganda



- Thank you for your attention