

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 SED	35 1.83*	40 2.18	71 2.64	443 184.1*	65 0.10	21 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 SED	33 1.83*	37 2.18	67 2.64	360 184.1*	65 0.10	25 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 (I 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 introduce 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

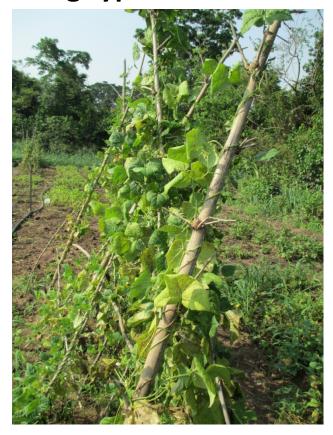
- ➤ 12 Snap Bean Accessions From Rwanda Through PABRA
- ➤ Observation Nursery was established during the off season
- ➤ Bush and climbing types
- ➤ Some are susceptible to Diseases
- ➤ Pod Colours: Yellowish green and green

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