Developing NUE Maize for Kenyan small holders

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IMAS Launch workshop, Jacaranda hotel Nairobi
16th-18th February 2010
Maize is the most important staple food crop in Kenya

It is grown on 1.6 m ha annually

Average ann. production 2.8 m metric tons

Consumption 3.2 m metric tons

Consumption levels in Kenya reach 85–145Kg per capita per year
• Research yields of up to 12 tons/ha
• Average yields under farmer circumstances 0.5 – 3 tons/ha
• Maize improvement work started in 1930 at Njoro
• The work was shifted to Kitale in 1955
• 1957 Katumani program was initiated
• 1965 the late Kitale materials were crossed with the early Katumani materials to form the medium altitude program at Embu
Maize improvement work in KARI done in 8 centres
In Kenya and ESA region farmers face constant challenges in their food security due to low yields and crop failure.

After drought the major challenge is low-soil fertility with poor nitrogen supplying capacity.

Access of Kenyan farmers to fertilizer is limited.

A durable long term solution would be:

- Develop maize varieties with enhanced ability to take up or utilize nitrogen in severely depleted soils.
- Varieties which can more efficiently use the small amounts of nitrogen that farmers supply to their crops.
Under no N- application the yields range from 0.5 tons/ha in the mid altitude zones to near 2 tons/ha in the highlands.

Fertilizer use has not been taken seriously in eastern Africa region. (Uganda 25,000 tons, Tanzania 211,013 tons, Ethiopia 276,000 tons, Kenya 500,000 tons)

Cost of delivery to farmers is usually high.

Road and rail networks are usually poor.
Even in Kenya a coastal nation the prices are still high.
African fertilizer prices are high because of small size of market:
- Limited competition among input dealers
- High financing costs.
Use of low rates of fertilizers in Kenya is likely to continue for a long time.
Screening capacity for yield under severely N-depleted conditions is limited 2 ha in Kenya. The project will add a total of 4 ha. Increase in screening capacity will result in increased rate of genetic gain. Varieties resulting from this enhanced direct selection will be the first outputs of the project to reach farmers. With NUE varieties farmers will be able to meet their maize food security needs from smaller cropped area. More land will be diverted to N-fixing legumes and higher value cash crops.
Project Sites

- KARI – Kitale
- KARI – Kakamega
- KARI – Embu
- KARI – Kiboko
- KARI – NARL
Site Selection and status

KARI Kakamega

- Has 1 ha field started by AMS
- Required fencing
- Re-alignment of the irrigation main line
- Leveling
- Expansion by 1 ha
- Additional 1 ha will require rapid N-depletion
- Confined field trial to be on Gvt. Land
- Identified a site at BATC
- A meeting with the principal scheduled to take place after the project launch workshop
- Officers requested to make budgets for any necessary changes and improvements
Identified 2ha field for screening trials
Requirements:
- Requires fencing
- Rapid N depletion required
- Some little leveling
- Identified a planB 2 ha field for CFT
- If used will require irrigation facilities
  - (pipes, risers, sprinkler heads)
- Rapid depletion
- Fencing
- Leveling
- Officers requested to make budgets for any necessary changes and improvements
KARI EMBU

- Had started depletion on 0.6 ha field
- Identified an area for expansion to 2ha
- Requires fencing
- There is need for extension of hydrants to reach the low-N field
- The field requires levelling
- N-depletion required
- The officers requested to make a budget for the said charges or improvements
KARI NARL

- Have most facilities but they are old and may need replacement
- The most urgent need was a mass flow spectrophotometer for analysis of N in grain and Stover
progress

- 81 inbred lines submitted in 2 sets
- As regards the elite cross for initiation of MARS the team suggested to have 2 populations
Project Team

- Dr. Dickson Ligeyo – Plant Breeder/Project coordinator
- Dr. Omari Odongo – Plant breeder/Centre director
- Dr. John Ojiem – Soil scientist
- Dr. Wycliffe Kiiya – Maize agronomist/soil scientist
- Dr. Phillip Kwena – Plant Breeder
- Mr. Japheth Wanyama – Socio Economist
- Dr. Charles Mutinda – Plant Breeder
- Dr. Simon Gichuki – Biotechnologist
- Dr. Catherine Kibunja – Soil Scientist
- Ms Dorcas Chepkesis – Plant breeder
THANK YOU

ASANTE