

WELCOME

Success Story of Maize Production in Bangladesh

FIROZA KHATUN

AND

CRAIG A. MEISNER

17 15:21



$20^{\circ}34'$ to $26^{\circ}38'$ North Latitude
 $88^{\circ}01'$ to $92^{\circ}41'$ East Longitude



Cropping season : 2

Rabi (October to March)

Kharif (April to September)

Temperature

10° - 20°C (Rabi season)

25° - 35°C (Kharif season)

Rainfall

1800 - 2800 mm annually

Cereal crops

Rice

Wheat

Maize

MAIZE





Can be grown 10 to 35°C

250 to 5000 mm rainfall

Grain yield up to 20 t/ha

Production cost of major cereals in Bangladesh

| Item | Maize | Wheat | Rice |
|-------------------------|-------|-------|-------|
| 1. Total Cost (\$/ha) | 586 | 396 | 603 |
| 2. Gross Return (\$/ha) | 864 | 464 | 798 |
| 3. Net Return (\$/ha) | 278 | 68 | 195 |
| 4. Benefit Cost Ratio | 1.47 | 1.17 | 1.32 |
| 5. Grain Yield (t/ha) | 7.71 | 3.26 | 7.41 |
| 6. Sale Price (\$/kg) | 0.112 | 0.142 | 0.108 |

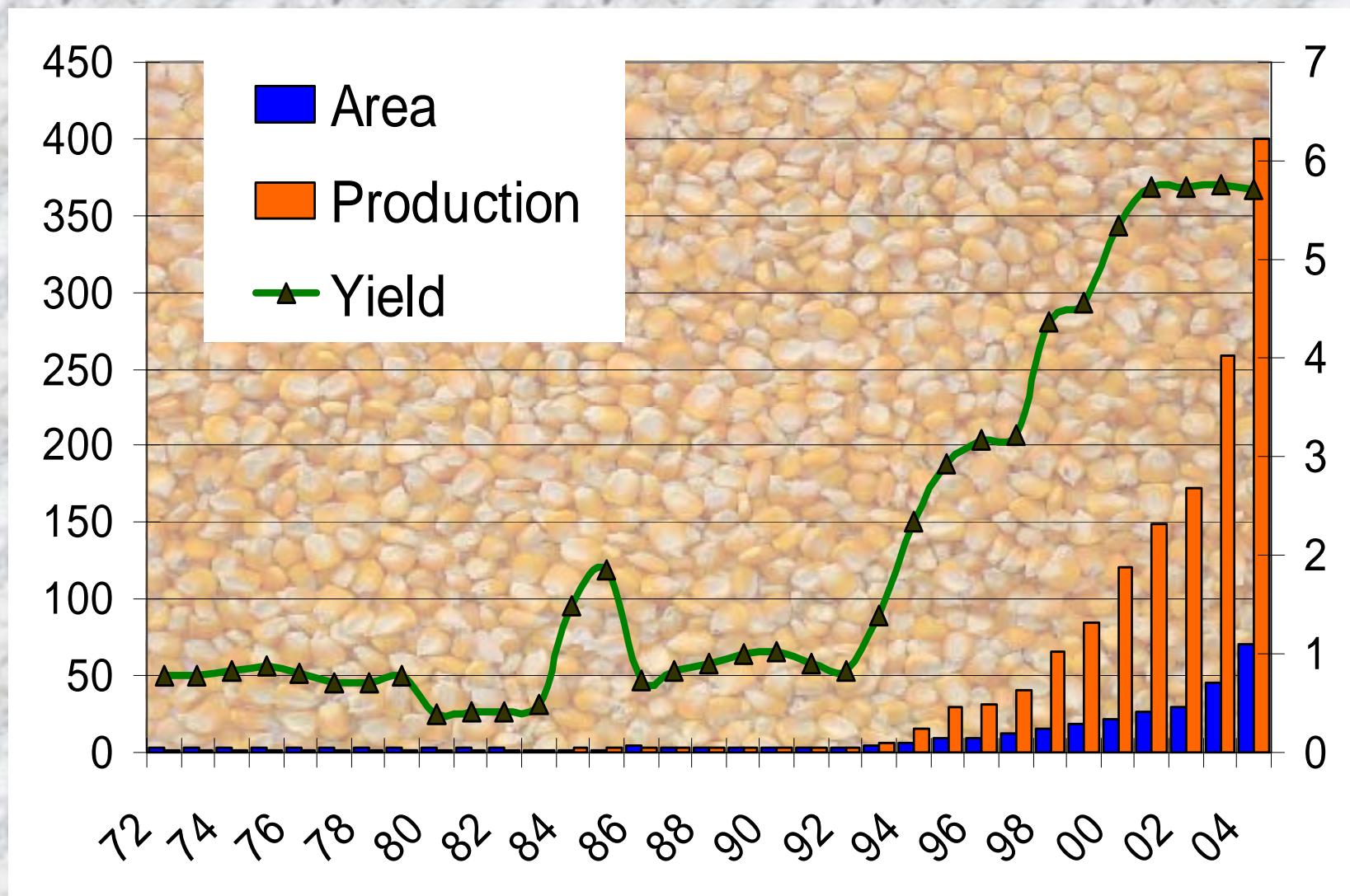
Source : North Bengal Seed Co., Bangladesh, 2002

Note : 1 USD = Tk. 58/-

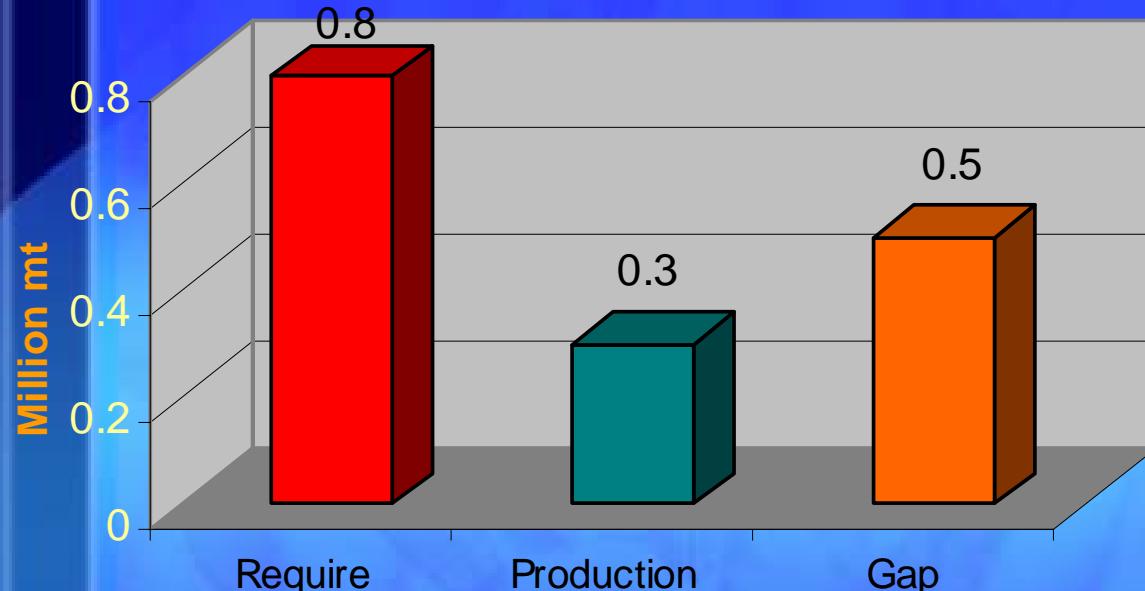
- ◆ In Bangladesh maize is being cultivated for a long time, but still it is minor crop.
- ◆ Previously sporadic attempts were made to accelerate maize production.
- ◆ During the last 10 years maize has gained an increasingly important attention by the Government.
- ◆ This is mainly due to huge demand for poultry feed industries.



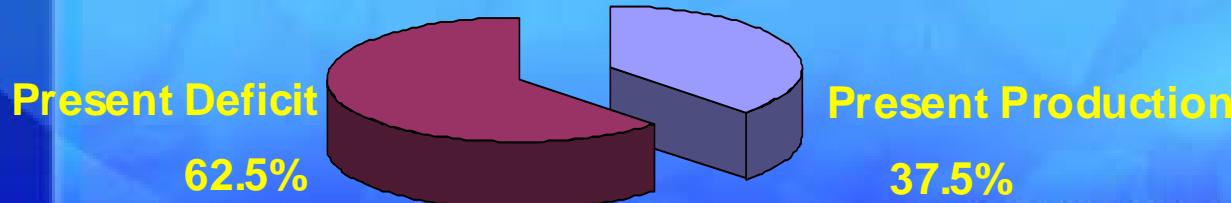
Maize production scenario of Bangladesh



Source: Department of Agricultural Extension
Area and Production trend is upward



Maize grain requirement for 43 poultry feed mills vs production and gap



CIMMYT
International Maize and Wheat Improvement Center

To meet the deficit we have to produce quality hybrid seed and farmers require improved production packages and training

Research & Development

- ◆ Research work on maize is carried out mainly by Bangladesh Agricultural Research Institute (BARI).
- ◆ Initial thrust was given for the development of open-pollinated varieties.
- ◆ Now major thrust has given for the development of hybrid varieties and seed production.
- ◆ Promotional activities has taken to increase production.

Major work activities

- 1. Collection of germplasm, evaluation and utilization for the development of improved variety through selection and hybridization.**
- 2. Inbred and hybrid development**
- 3. Generate appropriate production technologies for farmers.**
- 4. Transfer of technologies through training, seed distribution and demonstration.**
- 5. Seed Production- Mainly hybrid seed.**

Variety Development

Total variety developed : 12

Open pollinated varieties : 8

Hybrid varieties : 4

| Name of Variety | Yield (t/ha) | Year of release |
|----------------------------------|---------------------------|-----------------|
| Open pollinated varieties | | |
| 1. Barnali | 5.5 - 6.0 | 1986 |
| 2. Shuvra | 4.0 - 5.5 | 1986 |
| 3. Khoi bhutta | 3.5 - 4.0 | 1986 |
| 4. Mohar | 5.0 - 5.5 | 1990 |
| 5. BARI Maize 5 | 6.0 - 6.5 | 1997 |
| 6. BARI Maize 6 | 6.5 - 7.0 | 1998 |
| 7. BARI Maize 7 | 6.0 - 7.0 | 2002 |
| 8. BARI Sweet corn 1 | 9.5 - 10.5 (green cob) | 2002 |
| Hybrid varieties | | |
| 1. BARI Hybrid Maize 1 | 7.5 - 9.5 | 2000 |
| 2. BARI Hybrid Maize 2 | 8.0 - 9.0 | 2002 |
| 3. BARI Hybrid Maize 3 | 9.0 - 9.5 | 2002 |
| 4. BARI Top cross Hybrid 1 | 7.4 - 9.5 | 2002 |

Hybrid Seed Production

- **BARI is engaged to produce BARI released hybrid seed with close cooperation of CIMMYT at different research stations.**
- **BARI also distributed parental lines and giving technical assistance in cooperation with CIMMYT to GO (BADC), NGOs (BRAC) and Seed Producing companies (East West Seeds Ltd, DOEL Agro Industrial Complex, South Pool Seed, Supreme Seed Company, Chashi Kollan Samity) for large scale seed production.**

- It is expected that 20 tons of BARI released hybrid seeds will be produced by seed producing organizations this year.
- BARI will also produce 2 tons of hybrid seed, and 2 tons of parental materials.
- It is expected that 2000 tons of hybrid seeds would be produced from the parental materials in next year.
- In future, import can be reduced and large amount of foreign currency might be saved.
- Seed industries are gradually developing.

What Bangladesh is doing to meet the deficit

- ◆ **Promotion of maize through out the country**
- ◆ **DAE personnel demonstrate hybrid maize in farmers field through IMPP (Integrated Maize Promotional Project) to expand maize areas in the country.**
- ◆ **BRAC is producing hybrid maize seed. At 2003 - 2004 BRAC produced 375 MT hybrid seed.**
- ◆ **BARI - R&D of maize**
- ◆ **CIMMYT - Cooperating different organizations in R&D**

What CIMMYT doing to achieve the requirements?

- ✓ Whole Family Training
- ✓ Technical Assistance
 - ✓ GO
 - ✓ NGO
 - ✓ Private entrepreneurs
- ✓ Facilities Development
- ✓ Assist private seed companies

Whole Family Training Concept

- ✓ To popularize and increase maize production in the country, CIMMYT has initiated Farmers Whole Family Training Program in collaboration with BARI and DAE in different locations of the country since last 3 years.
- ✓ Farmers are motivated for hybrid maize cultivation through whole family training.

Why Whole Family Training?



Crop production in Bangladesh is a whole family activity because of all immediate family members participate in the crop production cycle and are affected by production decisions and results.

Additionally, families have different systems for determining intra-household labor allocation

ভূট্টা উৎপাদন পরিবারিক প্রশিক্ষণ

লালমনিরহাট

Why whole family training is effective ?

- ◆ Participatory
- ◆ Gender unbiased
- ◆ Attractive training materials
- ◆ Suitable training venues
- ◆ Local trainers and resource persons
- ◆ Continuously monitoring

Guide line to organize the Whole Family Tanning

CIMMYT Contribution

- ◆ **Train field supervisors/field organizers of the partners on modern maize production technology**
- ◆ **Provide training aids for the field supervisors/organizers and farmers**
- ◆ **Provide resource persons during farmers training**
- ◆ **Provide technical support on field problems**
- ◆ **Provide technical information on the latest maize production, processing, storing and marketing issues on request**

Partners Contribution

- ◆ Identify field supervisors/organizers and interested maize farmers
- ◆ Identify suitable training venues for the trainers and the farmers training sessions
- ◆ Conduct farmers training on maize production practices provide logistics to the identified field supervisors and farmers conduct maize trials resource conserving technologies and other maize agronomy research as and when given by CIMMYT at the partners own cost and resources
- ◆ Submit progress and special progress report as when requested by CIMMYT
- ◆ Organize farmers field days on special maize production issues with the invitation to CIMMYT to participation
- ◆ Provide list of NGOs and production sites in detail to CIMMYT for CIMMYT field visit

Partners

- **Government Organizations:**

- ◆ **Bangladesh Agricultural Research Institute**
- ◆ **Department of Agricultural Extension**
- ◆ **Bangladesh Agricultural Development Corporation**
- ◆ **Bangladesh Livestock Research Institute**

- **Non-government Organizations:**

- ◆ **Bangladesh Rural Advancement Committee**
- ◆ **Bangladesh Chashi Kollan Samity**

Partners

- **Private Entrepreneur:**

- ◆ **Doel Agro Industrial Complex Ltd.**

- **Private Seed Companies**

- ◆ **North Bengal Seed Company**
 - ◆ **Syngenta**
 - ◆ **Allied Agro Industries**
 - ◆ **Siddique Seeds**
 - ◆ **East-West seeds Ltd**
 - ◆ **A.R. Malik Seed companies Ltd.**
 - ◆ **Supreme Seed Company**
 - ◆ **South Pool Seed Company**

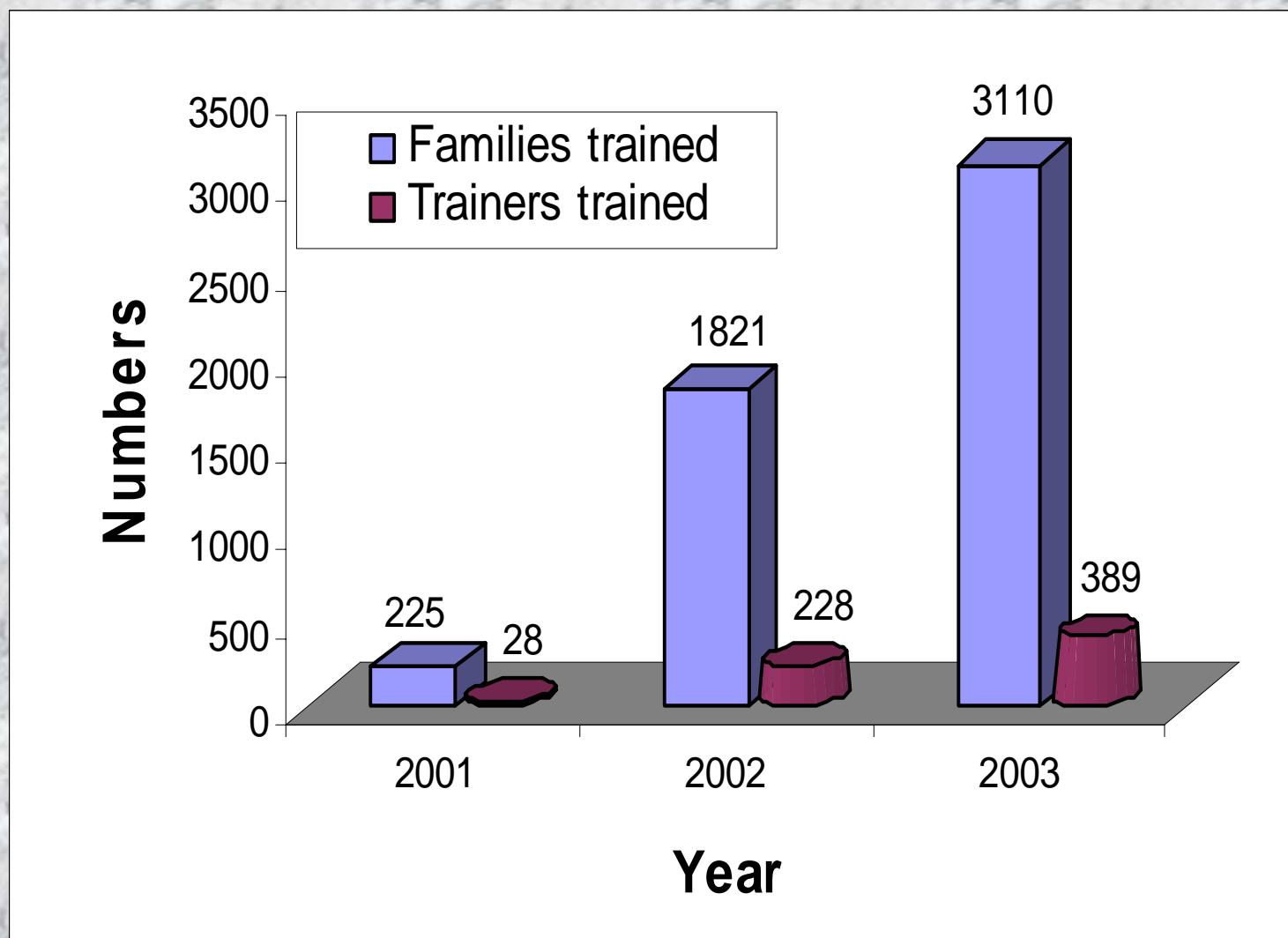


Trainers Training

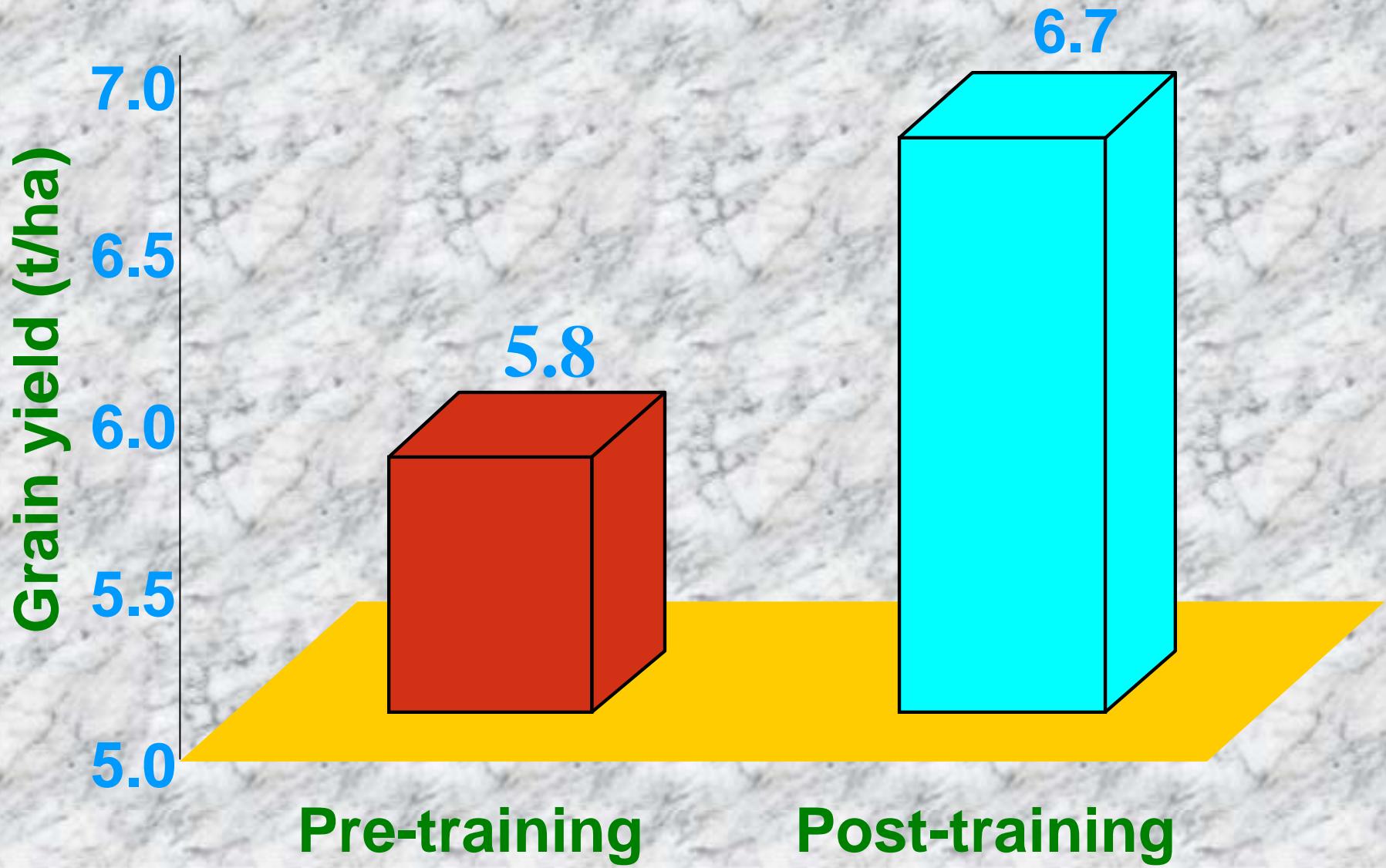


Whole Family Training

Number of Families Trained 2001-03



Assessing the benefit of WFT on maize productivity



- This year 18736 family members of 4684 farmers family were trained on modern maize cultivation techniques.
- Training manual and 2 kg hybrid maize seed were supplied to each family.
- As a result acreage and production of hybrid maize will increase.
- A revolutionary change in hybrid maize cultivation/production is expected throughout the country.
- Whole Family Training is an effective means of promoting hybrid maize.

Technical Assistance

Technical Assistance: Provide Germplasm



CIMMYT SUB-TROPICAL EARLY
YELLOW HYBRID TRIAL (PUNE) (CHTSYD)

MATERIALS : FOURTEEN HYBRIDS AND TWO LOCAL CHECKS

DESIGN : ALPHA LATTICE WITH 3 REPLICATION

PLOT SIZE : 9 ROW 5 m LONG

SPACING : 75 x 20 cm (ONE PLANT/HILL)

D/S : 25.11.03

PLANT BREEDING DIVISION

Technical Assistance:
**Varietals evaluation on station
(Quality Protein Maize (QPM),
New Hybrid, etc.)**



Technical Assistance:

On farm evaluation of QPM

ON-FARM VERIFICATION TRIAL OF
QUALITY PROTEIN MAIZE (QPM) ALONG
WITH COMMERCIAL HYBRID MAIZE
(विधायक क्षेत्र में गोपनीय प्रोटीन मैज़ का विकास क्षेत्र)

| | |
|--|----------------|
| Variety : | 2. |
| Yield (t/ha) : | 7.900 ± 0.200 |
| Plant Ht. : | 230 cm |
| Grain : | 20 mm x 2.2 mm |
| Gl. Density : | 85.00 g/l |
| Grain Protein (%) : | 10.5 |
| Registration No. : | MAA/MA/100 |
| Regional Maize Research Centre, Pilibhit | |



23-4-2004



Technical Assistance:
QPM with Double cobs yields about 11 t/ha

The background image shows a lush, green field of young maize plants. The plants are arranged in distinct, parallel rows, creating a sense of agricultural organization. The leaves are long, narrow, and slightly curved, typical of the early growth stage of maize. The overall color palette is dominated by various shades of green.

Technical Assistance:

Maize agronomy

(Maize + Potato)

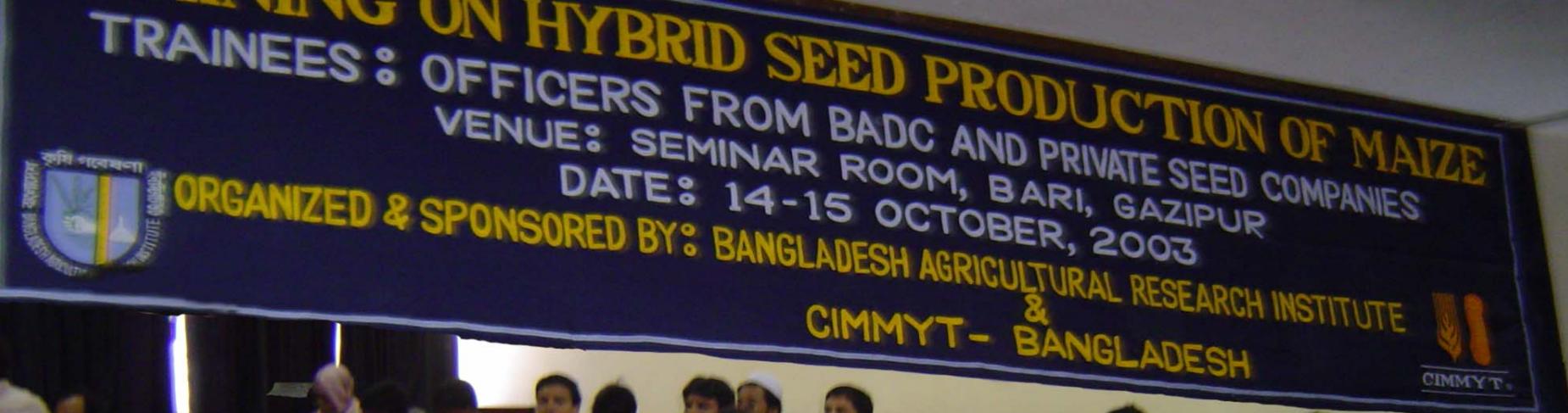
QPM Feeding trial

► Layer

► Broiler

► Goat





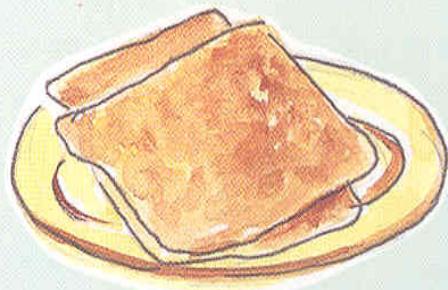
Facility Development

- **Seed Store**
- **Laboratory and Field Equipment**
- **Transportation**

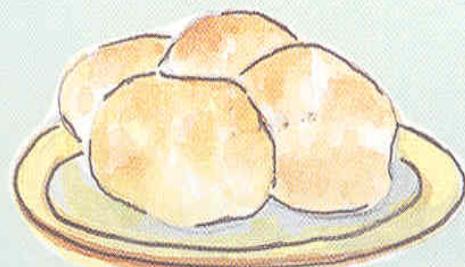
Maize as human food

মানুষের খাবার

পরোটা



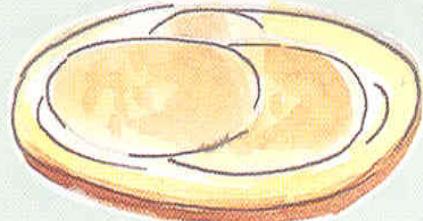
লুচি



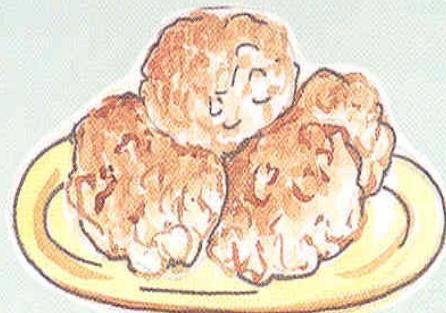
খিচড়ি



বুটি



মোয়া



নাড়ু



পোড়া ও সেদ্ব মোচা

Roasted and boiled cob



মোচা পোড়ানো



Capacity 100 kg tortilla/hr (under trial)



Chapati Making process for human food!

Other uses of maize



ভুট্টার পাতা গবাদি পশুকে খাওয়ানো যায়

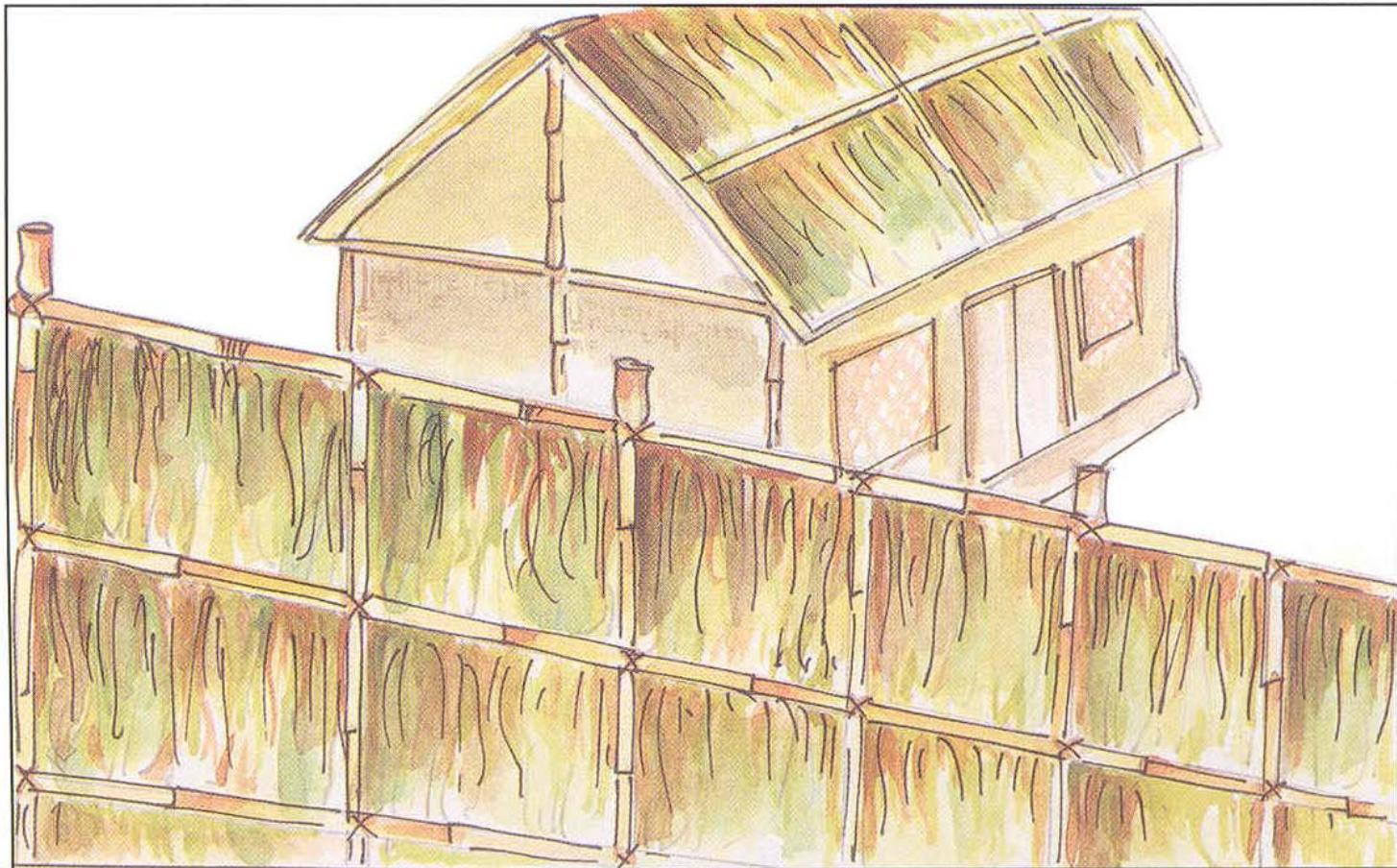
Maize leaf as fodder



ভুট্টার দানা মোরগ-মুরগির সুষম খাবার

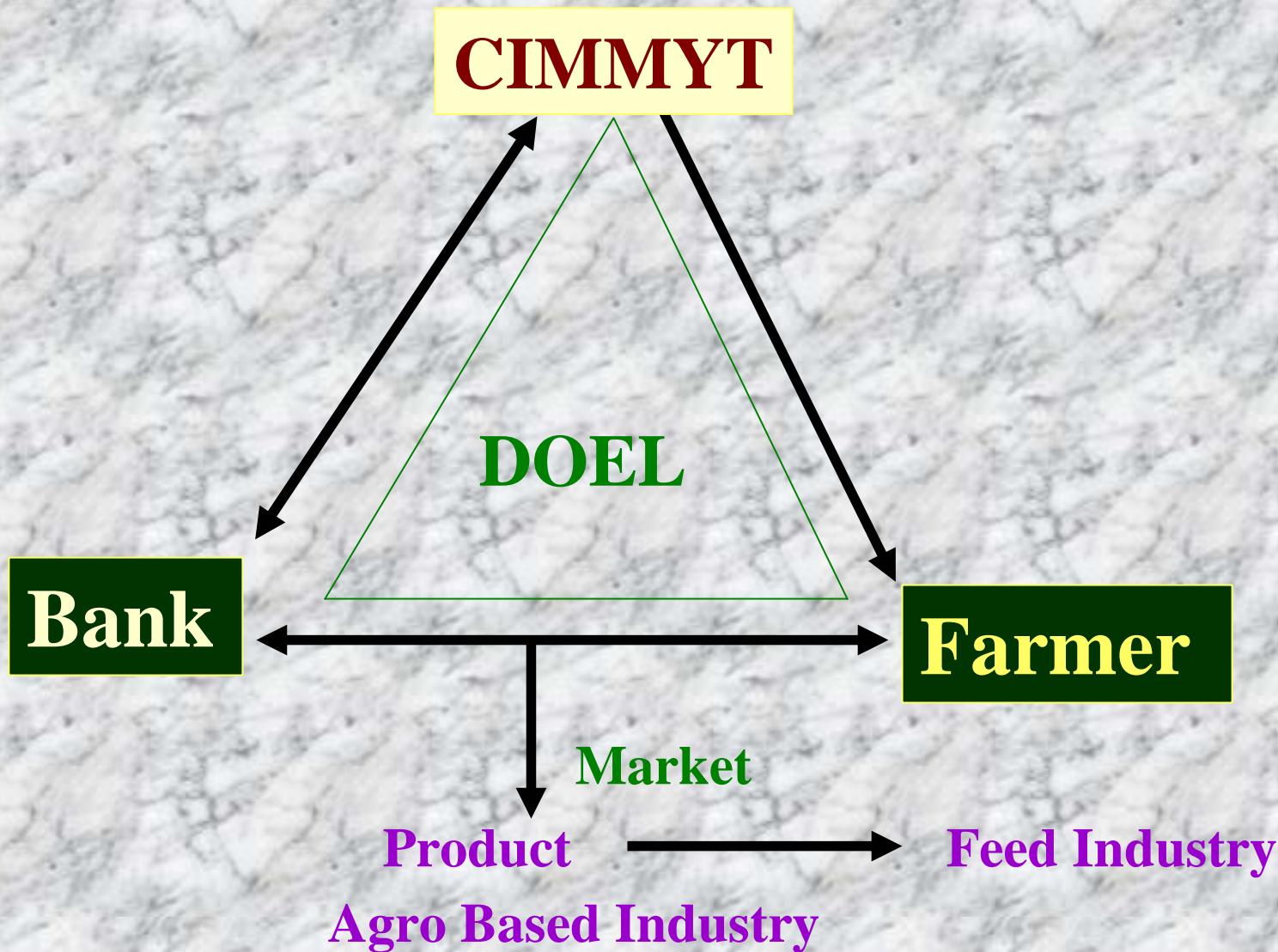
Maize grain as feed

Maize plants and leaves as roof and fencing of house



ভুট্টা গাছ ও পাতা ঘরের ছাউনি ও বেড়ায় ব্যবহার করা যায়

Success with DOEL Agri Business Corporation



DOEL

| Year | Area (Acres) |
|-------------|---------------------|
| 2002 | 1600 |
| 2003 | 8500 After WFT |
| 2004 | 10000 |
| 2010 | 25000 |

Benefits



**One homeless family of Bogra
Whose land was 0.1 acre. He
built a tin home from maize
profit**



**One family of Lalmonirhat
went from a tin home to a brick
home from maize profit**

Maize cultivation is increasing in Bangladesh





Thank You