

Annual Research Programme
(2015-16)

Plant Breeding Division

- Programme Area I : Varietal Improvement of Cereals**
- Project 1 : Varietal improvement of T. Aman, Boro and Aus rice by induced mutation and other advanced breeding techniques**
- Objectives :** To develop varieties with
- higher yield (≥ 6.0 t/ha for T. Aman, ≥ 7.0 t/ha for Boro and ≥ 5.0 t/ha for Aus);
 - early maturity (100-110 days in T. Aman and 130-140 days in Boro and 100-110 in Aus);
 - tolerance to major diseases and insect-pests;
 - strong grain aroma with long slender grain;
 - higher iron content; and
 - tolerances to low/high temperature, drought, salinity and deep water.
- Personnel assigned :** Dr. M.A.K. Azad, PSO (PI)
Md. Md. Hasanuzzaman, SO
Md. Abu Sayed, ASO
Shahnaz Pervin, ASO
Md.. Shahidulla, SA-I
- Status :** One Boro mutant line that matures 10-15 days earlier than BRRI dhan29 and produce higher yield is being evaluated by the SCA teams to assess its potentiality to be released as a variety. Another iron rich line will be put into field evaluation trial in the next T. Aman season. Additionally, three mutant lines derived from NERICA-10 rice have been put into zonal yield trial in the ongoing Aus season and these will be also put into zonal yield trial in the next T. Aman season. Moreover, four M₅ high yielding deep water rice mutants will be put into preliminary yield trial under field conditions.

T. AMAN

Yield and Adaptive Trials

Experimental details

- Experiment 1 : Field evaluation of a high yielding iron rich mutant line (CCTF funded)**
- Objective :** To assess yield potential and earliness over locations for releasing as a variety
- Growing season :** July to December 2015
- Treatments :** 2 (Mutant-1 and Check variety-1)
- Design and replication :** RCBD with 4 replications
- Location :** 10: On-station (5): BINA Headquarters farm, Mymensingh and Sub-stations at Rangpur, Jamalpur, Comilla and Nalitabari
Farmers' field (5): Mymensingh, Rangpur, Jamalpur, Comilla and Nalitabari
- Unit plot size :** 6 m × 5 m
- Total area :** 300 m²
- Data to be recorded :** Plant height, no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield/plant and yield/ha and protein, amylose, zinc and iron content.

Experiment 2 : **Zonal yield trial with M₆ mutant lines of NERICA-10 rice**

Objective : To assess earliness and yield performance under direct seeding and rainfed conditions

Growing season : July – December 2015

Mutants/check : 5 (3 mutants-3 and 2 check varieties)

Design and replication : RCBD with 3 replications

Location : 9: On-station (5): BINA Headquarters farm, Mymensingh and Sub-stations at Rangpur, Ishurdi, Chapainawbabganj and Magura Farmers' field (4): Rangpur, Ishurdi, Rajshahi and Magura

Unit plot size : 4.0 m × 3.0 m

Total area : 20 m × 15 m = 300m²

Data to be recorded : Plant height, no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield

Experiment 3 : **Preliminary yield trial with some aromatic rice lines**

Objective : To assess yield and maturity

Growing season : July – December 2015

Mutants/check : 20 (19 mutants and 1 check variety)

Design and replication : RCBD with 3 replications

Locations : BINA Headquarters farm, Mymensingh

Unit plot size : 3.0 m × 1.0 m

Total area : 30 m × 12 m = 360 m²

Data to be recorded : Plant height, no. of tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield

Experiment 4 : **Preliminary yield trial with M₅ mutants of deep water rice under deep water condition**

Objective : To assess yield and maturity under deep water condition

Growing season : April to December 2015

Mutants/check : 5 (Mutants-4 and check cultivar-1)

Design and replication : RCBD with 3 replications

Locations : BINA sub-station farms at Barisal and Sunamgonj

Unit plot size : 1.0 m × 1.0 m

Total area : 60 m²

Data to be recorded : Plant height, no. of tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield

Handling of Segregating Materials

Experiment 5 : **Screening of recurrent carbon ion irradiated M₁R₂ population of Swarna rice in T. Aman season**

Objective : To select BLB, sheath blight resistant and high yielding plants/progenies

Population : 4 (Bulk population of 20+20, 20+30 and 20+40Gy of recurrent carbon ion beam irradiated population of Swarna along with the parent)

Design and replication : Non-replicated

Location : BINA Headquarters farm, Mymensingh

Total area : 200 m²

Data to be recorded : Plant height, days to flower (50%, 90%), no. of tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield

Design and replication : Non-replicated

Location : BINA Headquarters farm, Mymensingh

Total area : 100 m²

Experiment 6	Screening of gamma ray irradiated M₂ population of BR11 in T. Aman season
Objective	: To select BLB, sheath blight resistant and high yielding plants/progenies
Population	: 5 (Bulk population of 150, 200, 250 and 300Gy of carbon gamma ray irradiated population of BR11 along with BR11 parent)
Design and replication	: Non-replicated
Location	: BINA Headquarters farm, Mymensingh
Total area	: 200 m ²
Data to be recorded	: Plant height, days to flower (50%, 90%), no. of tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield, reactions to BLB and sheath blight diseases (Plant Pathology Division)
Experiment 7	Screening of gamma ray irradiated M₂ population of BRRI dhan49 rice in T. Aman season
Objective	: To select false smut resistant and high yielding plant/progenies of BRRI dhan49
Population	: 5 (Bulk population of 150, 200, 250 and 300 Gy of carbon gamma ray irradiated population of BRRI dhan49 along with BRRI dhan49 parent)
Design and replication	: Non-replicated
Location	: BINA Headquarters farm, Mymensingh
Total area	: 200 m ²
Data to be recorded	: Plant height, days to flower (50%, 90%), no. of tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield, reactions to false smut disease (Plant Pathology Division)
Materials Development	
Experiment 8	Recurrent irradiation to M₁ seeds of BRRI dhan49 rice in T. Aman season
Objective	: To develop false smut resistant and high yielding mutant(s) of BRRI dhan49
Population	: 3(150+150, 150+200, 150+250)Gy along with a non-irradiated control of BRR dhan49
Design and replication	: Non-replicated
Location	: BINA Headquarters farm, Mymensingh
Total area	: 100 m ²
Data to be recorded	: Germination, survival, seedling height, days to flower (50%, 90%), no. of tillers, panicle length, no. of filled and unfilled grains and days to maturity and grain yield/plant.
Experiment 9	Growing of M₁ generation of Biroi rice in T. Aman season
Objective	: To develop mutants with higher yield and lodging resistance
Gamma ray doses	: 4: 200, 250, 300 and 350 Gy doses along with a non-irradiated control of Biroi
Design and replication	: Non-replicated
Location	: BINA Headquarters farm, Mymensingh
Total area	: 100 m ²
Data to be recorded	: Germination, survival, seedling height, days to flower (50%, 90%), no. of tillers, panicle length, no. of filled and unfilled grains and days to maturity and grain yield/plant.

BORO

Yield and Adaptive Trials

- Experiment 10** : **Zonal yield trial with high yielding mutant lines**
- Objective : To assess yield potential over locations
Growing season : December 2015 to May 2016
Treatments : 3 (2 mutants and 1 check variety)
Design and replication : RCBD with 3 replications
Locations : 6: On-station (4): BINA Headquarters farm, Mymensingh and sub-station farms at Comilla, Barisal and Sunamgonj
Farmers' field (2): Gopalganj and Jhalokathi
- Unit plot size : 5.0 m × 3.0 m -
Total area : 132 m²
Data to be recorded : Plant height, no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield/plot and yield/ha and DUS test traits
- Experiment 11** : **Preliminary yield trial with some aromatic rice lines**
- Objective : To assess yield and maturity
Growing season : December – May 2016
Mutants/check : 20 (Mutants-19 and check -1)
Design and replication : RCBD with 3 replications
Locations : BINA Headquarters farm, Mymensingh and BINA Sub-station farm, Magura
- Unit plot size : 3.0 m × 1.0 m
Total area : 30 m × 12 m = 360 m²
Data to be recorded : Plant height, no. of tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield

AUS

Yield and Adaptive Trials

- Experiment 12** : **On-farm and on-station trial with M₇ mutants of NERICA-10 rice under direct seeding and rainfed condition (CCTF funded)**
- Objective : To assess earliness and yield performance under direct seeding and rainfed conditions
Growing season : April to July 2016
Treatments : 3 (1 mutant and 2 check varieties)
Design and replication : RCBD with 3 replications
Unit plot size : 6.0 m × 5.0 m
Total area : 400 m²
Locations : 12: On-station (6) (BINA Headquarters farm, Sub-station farms at Rangpur, Ishurdi, Magura Chapainawabganj and Nalitabari)
Onfarm (6): Mymensingh, Ishurdi, Magura, Chapainawabganj and Nalitabari
- Data to be recorded : Plant height, no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield/plot and yield/ha and protein, amylose, zinc and iron content
- Experiment 13** : **Preliminary yield trial with some Kasalath mutants**
- Objective : To assess yield performance under phosphorus deficit condition
Growing season : April to July 2016
Populations : 5 (4 Mutants and 1 parent)
Design and replications : RCBD with 3 replications
Location : BINA Headquarters farm, Mymensingh
Data to be recorded : Plant height, no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield/plot and yield/ha.

Maintenance Breeding

- Experiment 14** : **Germplasm maintenance** T. Aman and Boro rice
- Objective : To maintain the seeds (genetic resources) of different cultivars/ mutants for future use
- Growing season : T. Aman (July – December, 2015) and Boro (December 2015 – June, 2016)
- Treatments : 140 (35 mutants and 105 local cultivars) in Boro and 225 (14 mutants and 211 local cultivars) in T. Aman
- Design and replications : Non-replicated
- Location : BINA Headquarters farm, Mymensingh
- Unit plot size : 4.5 m × 0.4 m
- Total area : 200 m²
- Data to be recorded : 10-20 Panicles of the varieties/mutants/genotypes will be harvested separately
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- Project 2** : **Genetic enhancement of salinity and drought tolerance in rice through nuclear and other advanced breeding techniques**
- Objectives** : To develop varieties/mutant lines with
- salinity/drought tolerance;
 - ensuring higher grain yield under salinity/drought stresses; and
 - tolerances to major diseases and pests
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- Personnel assigned** : Dr. Md. Imtiaz Uddin, SSO (PI)
Dr. M. A. Malek, PSO & Head
Mr. Mohammad Asad Ullah, SO
Mr. Md. Mosharaf Hossain, ASO
Mr. Amzad Hossain, SA-I
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- Status** : New
- The long-term objective of this project is to seek a better understanding of the genetic and molecular bases of rice mutants' response to abiotic and biotic stresses in an effort to maintain high yields, improve crop resilience to changes in climate and cultural management practices, and to reduce reliance on pesticides for crop protection. Pokkali is a well known salinity tolerant cultivar which induces two novel salt tolerant genes OsNHX (Na⁺/H⁺ vacuolar antiporter) and OsHKT (responsible for Na⁺ homeostasis). An indica local cultivar FR13A also induces two novel genes OsARP and OsMGD showed high level of tolerance to salinity and drought stresses. These two cultivars would be used as base genetic materials for developing elite salinity/drought tolerant varieties/mutants/ breeding lines. The outcome of this research will result in genetic markers linked to traits that can be incorporated into new cultivars that are resilient to salinity/drought/submergence, diseases, insects, extremes in temperature, and can be grown under production practices that use less water.

Boro and T. Aman

Experimental details

Yield and Adaptive Trials

- Experiment 15** : **Evaluation of rice germplasm/land races under salinity/drought stresses**
- Objective : To assess level of tolerances under high salinity and drought stresses
- Growing season : Boro (December 2015 - May 2016)
- Treatments : 10 cultivars/land races (salinity stress: 80, 100, 120 and 150 mM of NaCl)
- Design and replication : Non-replicated
- Locations : BINA Headquarters farm, Mymensingh
- Unit plot size : Pot experiment
- Total area : -
- Data to be recorded : Morpho-physiological parameters related to salinity/drought stresses (collaboration with Crop Physiology Division).
- Experiment 16** : **Advanced yield trial of some drought tolerant rice mutants/lines (Funded by CCTF)**
- Objective : To assess yield potentials under drought condition
- Growing season : T. Aman (July- December 15)
- Treatments : 5 (4 Mutants/line and 1 check variety)
- Design and replication : RCBD with 3 replications
- Locations : BINA sub-station farm/farmers' field at Chapainawbabganj and Rajshahi
- Unit plot size : 5.0 m × 4.0 m
- Total area : 30.0 m × 20.0 m = 600 m²
- Data to be recorded : Plant height, days to flower (50%, 90%), no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield

Handling of Segregating Materials

- Experiment 17** : **Growing of M₂ populations of salt/drought tolerant land races**
- Objective : To select desirable salinity/drought tolerant rice mutants
- Growing season : Boro (December 2015 - May 2016)
- Design and replication : Non- replicated/Plant progeny
- Location : BINA Headquarters farm, Mymensingh
- Total area : 20 m × 20 m = 400 m²
- Data to be recorded : Plant height, days to flower (50%, 90%), no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield (grain/plant)

Materials Development

- Experiment 18** : **Growing of M₁ populations of salt/drought tolerant land races**
- Objective : To develop salinity/drought tolerant rice mutants
- Growing season : Boro (December 2015-May 2016)
- Treatments : 3 landraces , doses: 150, 200 and 250 Gy
- Design and replication : Non- replicated
- Location : BINA Headquarters farm, Mymensingh
- Unit plot size : 5 m × 4 m
- Total area : 20 m × 10 m = 200 m²
- Data to be recorded : Plant height, days to flower (50%, 90%), no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield (grain/plant)

Experiment 19 : **Crossing of salinity/drought tolerant landraces with elite mutants/cultivars for producing F₁ seeds**

Objective : To transfer salinity/drought tolerant characters to elite cultivars

Growing season : Boro (December 2015 - May 2016)

Treatments : 2 salt tolerant landraces + 2 elite high yielding cultivars/mutants

Design and replication : Non- replicated

Location : BINA Headquarters farm, Mymensingh

Unit plot size : Pot experiment

Total area : -

Data to be recorded : No. of fertile seeds

Project 3 : **Genomic approaches and genetic resources for improving rice yield and grain quality**

Objectives :

- To develop varieties/mutant lines with
 - strong grain aroma, moderate amylose content (18-21%) with long slender grain (Basmati type);
 - higher grain yield, photoperiod insensitive and semi-dwarf and strong plant types; and
 - tolerances to major diseases and pests

Personnel assigned :

- Dr. Md. Imtiaz Uddin, SSO (PI)
- Dr. M. A. Malek, PSO & Head
- Mr. Mohammad Asad Ullah, SO
- Mr. Md. Mosharaf Hossain, ASO
- Mr. Amzad Hossain, SA-I

Status :

New

This project will explore existing genetic rice resources and to elucidate genetic and environmental factors that influence yield and grain quality. Using marker-assisted selection to introgress novel alleles and to stack genes associated with yield, disease resistance, and grain milling, cooking, aroma and nutritional quality into new cultivars and improved breeding stocks. Developing marker analysis platform for marker-assisted transfer of traits from various rice germplasm backgrounds into targeted cultivars.

T. AMAN

Experimental details

Yield and Adaptive Trials

Experiment 20 : **Evaluation of rice grmplasm/land races for yield potentials and premium grain quality**

Objective : To assess yield potentials, aroma and photoperiod sensitivity

Growing season : T. Aman (July - December 2015)

Treatments : 20 cultivars/land races

Design and replication : RCBD with 3 replications

Locations : BINA Headquarters farm, Mymensingh

Unit plot size : 1.0m × 1.0m

Total area : 10m × 15m = 150m²

Data to be recorded : Plant height, days to flower (50%, 90%), no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield (per plant), amylose content, aroma, grain size and shape.

Experiment 21 : Zonal yield trial of some early maturing fine grain rice mutants

Objective : To assess yield potentials and earliness in T. Aman season
Growing season : T. Aman (July- December 2015)
Treatments : 3 (Mutant/lines-3 and check variety-1)
Design and replication : RCBD with 3 replications
Locations : BINA Headquarters farm, Mymensingh, BINA sub-station farms at Rangpur, Magura, Jamalpur, and Comilla
Unit plot size : 5.0×4.0 m
Total area : $20.0 \text{ m} \times 20.0 \text{ m} = 400 \text{ m}^2$
Data to be recorded : Plant height, days to flower (50%, 90%), no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield

Handling of Segregating Materials

Experiment 22 : Growing of M₂ populations of some aromatic land races

Objective : To select desired plant types
Growing season : T. Aman (July – December 2015)
Design and replication : Non- replicated/Plant-progeny
Location : BINA Headquarters farm, Mymensingh
Total area : $20 \text{ m} \times 20 \text{ m} = 400 \text{ m}^2$
Data to be recorded : Plant height, days to flower (50%, 90%), no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield (per plant), amylose content, aroma, grain size and shape

Materials Development

Experiment 23 : Growing of M₁ populations of some aromatic land races

Objective : To select desired plant types
Growing season : T. Aman (July – December 2015)
Treatments : 3 landraces , doses: 150Gy, 200Gy and 250Gy
Design and replication : Non- replicated
Location : BINA Headquarters farm, Mymensingh
Unit plot size : $5 \text{ m} \times 4 \text{ m}$
Total area : $20 \text{ m} \times 10 \text{ m} = 200 \text{ m}^2$

Experiment 24 : Crossing of aromatic landraces with elite rice mutants/cultivars for producing F₁ seeds

Objective : To transfer aroma and premium quality characters to elite cultivars/mutants
Growing season : T. Aman (July- December 2015)
Treatments : 2 aromatic landraces+ 2 elite high yielding cultivars/mutants
Design and replication : Non- replicated
Location : BINA Headquarters farm, Mymensingh
Unit plot size : Pot experiment
Total area : -
Data to be recorded : No. of fertile seeds

Project 4 : **Development of heat and salt tolerant wheat variety**

Objective(s) : To develop heat and salt tolerant wheat varieties

Personnel assigned : Dr. Md. Abul Kalam Azad, PSO (PI)
Mrs. Fahmina Yasmine, SSO
Mr. Md. Kamruzzaman, SO
Mr. Sadequr Rahman, SA-I
Mr. Habibur Rahman Mridha, SA-I
Mr. Amzad Hossain, SA-1

Experimental details

Yield and Adaptive Trial

Experiment 25 : **Field evaluation of a high yielding salt tolerant wheat mutant (CCTF funded)**

Objective : To assess yield potential and days to maturity for releasing as a variety

Growing season : November 2015 to March 2016

Mutant/check variety : 2 (L-880-43 and BARI Gom-25)

Design and replication : RCBD with 4 replications

Locations : 14: (Satkhira-2, Patuakhali-2, Borguna-2, Bagherhat-2, Khulna-2, Ishurdi-2 and Rangpur-2)

Unit plot size : 6 m × 5 m

Total area : 300 m²

Data to be recorded : Plant height, no. of effective tillers, panicle length, no. of filled and unfilled grains, days to maturity and grain yield/plant and yield/ha and protein content in grain

Handling of Segregating Materials

Experiment 26 : **Screening of M₂ progenies of wheat for heat tolerance**

Objectives : To select heat tolerant plants with shorter duration

Growing season : December 2015 to April 2016

M₂ progenies : Pradip: 576 (150 Gy=175, 200 Gy=156, 250 Gy =121 and 300 Gy = 124); BARI Gom-25: 938 (150 Gy=267, 200 Gy=235, 250 Gy =250 and 300 Gy = 186) and GP : 714 (150 Gy=180, 200 Gy=184, 250 Gy =166 and 300 Gy = 184)

Design : Spike-progeny-row

Total area : 600 m²

Locations : BINA Headquarters farm, Mymensingh

Data to be recorded : Germination %, survival %, seedling height, and panicle length, no. of grains/panicle, sterility (%), days to maturity

Experiment 27 : **Screening bulk M₂ population of wheat for heat and salt tolerance**

Objectives : To select heat and salt tolerant plants with shorter duration

Growing season : December 2015 to April 2016

M₂ Populations and parents : 15 (M₂ populations: 12 and parents: 3)
Pradip (4): 150 Gy, 200 Gy, 250 Gy and 300 Gy
BARI Gom-25 (4):150 Gy, 200 Gy, 250 Gy and 300 Gy
GP (4) : 150 Gy, 200 Gy, 250 Gy and 300 Gy

Unit plot size : (6 ^ 2=10) m²

Design and replication : Non replicated

Total area : 180 m²

Locations : 1 (BJRI regional station, Pakhimara, Patuakhali)

Data to be recorded : Plant height, panicle length, no. of effective tillers, no. of filled and unfilled grains/panicle, days to maturity and salinity records

Project 5 : **Varietal improvement of Foxtail millet through mutation and other advanced breeding techniques**

Objectives : To develop varieties/mutant lines with
- higher grain yield;;
- ensuring higher grain yield under salinity/drought stresses; and
- tolerances to major diseases and insect-pests

Personnel assigned : Dr. Md.Imtiaz Uddin, SSO (PI)
Mr. Md. Mosharaf Hossain, ASO

Status : **New**
Foxtail millet (*Pennisetum glaucum* L.) is one of the most drought resistant grains in commercial production. It is able to grow in areas that experience frequent periods of dry weather during either the vegetative or reproductive phases. Pearl millet appears to be more tolerant of sandy and acidic soils than other summer grain crops. It is deep-rooted and can use residual nitrogen, phosphorus and potassium and, therefore, may not need the levels of fertility required by other summer grains. These characteristics enhance pearl millet's desirability in lower input, dry land production systems. Severe drought reduces yields of pearl millet, but the plant is capable of withstanding periods of drought that would cause greater yield reductions or crop failure in other summer grain crops. It is well suited for double cropping behind small grains and vegetables. The grain can be used in poultry and cattle without adversely affecting feed efficiency or weight gain. Total metabolizable energy of pearl millet is similar to corn. Crude protein levels in pearl millet range from 12 to 14%. Therefore, yield improvement of this minor cereal would have the great impact on the marginal farmers of drought/salinity prone areas of Bangladesh.

Experimental details

Yield and Adaptive Trial

Experiment 28 : **Evaluation of pearl millet germplasm under drought/salinity stresses.**

Objective : To assess level of tolerances under high drought and salinity stresses

Growing season : December 2015-May 2016

Treatments : 10 cultivars/land races (drought stress: 5%, 8%, 10%,15% and 20% PEG; and salinity stress: 80, 100, 120 and 150 mM of NaCl)

Design and replication : Non-replicated

Locations : BINA Headquarters farm, Mymensingh

Unit plot size : Pot experiment

Total area : -

Data to be recorded : Morpho-physiological parameters related to drought/salinity stresses (collaboration with Crop Physiology Division).

Experiment 29 : Germplasm collection of locally growing different pearl millet cultivars and evaluation for yield attributes

Objective	: To assess yield and other morpho-physiological attributes under normal growth condition
Growing season	: (December 2015 – May 2016)
Treatments	: 20 cultivars/land races
Design and replication	: Non-replicated
Locations	: BINA Headquarters farm, Mymensingh
Unit plot size	: 4.0 m × 2.5 m
Total area	: 100 m ² (approx.)
Data to be recorded	: Plant height, days to flower (50%, 90%), panicle length, no. of kernels per panicle, kernel weight, days to maturity and grain yield (grain/plant)

Handling of segregating Materials

Experiment 30 : Growing of M₂ populations of pearl millet

Objective	: To develop salinity/drought tolerant high yielding pear millet mutants
Growing season	: (December 2015-May 2016)
Design and replication	: Non- replicated/Plant progeny
Location	: BINA Headquarters farm, Mymensingh
Unit plot size	: 5 m × 4 m
Total area	: 20 m × 20 m=400 m ²
Data to be recorded	: Plant height, days to flower (50%, 90%), panicle length, no. of kernels per panicle, kernel weight, days to maturity and grain yield (grain/plant)

Material Development

Experiment 31 : Growing of M₁ populations of pearl millet

Objective	: To develop salinity/drought tolerant high yielding pear millet mutants
Growing season	: (December 2015 - May 2016)
Treatments	: 3 landraces ,* irradiation doses need to be determined
Design and replication	: Non- replicated
Location	: BINA Headquarters farm, Mymensingh
Unit plot size	: 5 m × 4 m
Total area	: 20 m × 10 m=200 m ²
Data to be recorded	: Plant height, days to flower (50%, 90%), panicle length, no. of kernels per panicle, kernel weight, days to maturity and grain yield (grain/plant)

Project 6 : Development of semi dwarf and high yielding maize varieties through induced mutation

Objectives : To develop varieties/mutant lines with

- dwarf plant height
- tolerant to water logged condition
- higher seed yield and
- tolerances to major diseases and pests

Personnel assigned : Dr. Md. Imtiaz Uddin, PSO (PI)
Dr. M. A. Malek, PSO & Head
Mrs Fahmina Yasmine, SSO
Md. Kamruzzaman, SO

Status : **New**
Short stature, erect leaf angle, disease resistance and high yield are traits that have been pursued by the breeders. Short and moderately short varieties are more resistant to lodging and compatible with higher planting density. Identification of dwarf varieties is highly desirable. Planting density affects the grain yields of maize more than other members of grass family. In the past few decades, maize yield has been increased mainly by adopting modern hybrids that are more tolerant planting density and other biotic and abiotic stresses. Due to competition for light, plant height increases with planting density. This tends to decrease stalk diameter and increase the potential of stalk lodging, leading to yield losses

Experiment 32 : Collection and Evaluation of local/exotic maize cultivars and inbred lines

Objective : To assess yield potential and other morpho-physiological attributes

Treatments : 20 cultivars/land races

Locations : BINA Headquarters farm, Mymensingh

Data to be recorded : Days to number of 50% silking, plant height, ear height, ear length, ear diameter, number of rows/ear, number of kernels/rows, grain yield

Experiment 33 : Selfing of maize for developing pure inbred lines

Objective : To get pure inbred line

Treatments : 20 cultivars/land races

Locations : BINA Headquarters farm, Mymensingh

Experiment 34 : Irradiation of selected maize cultivars and growing of M₁ populations

Objective : To create variability for high yielding dwarf mutant

Treatments : 3 landraces, doses: 150Gy, 200Gy and 250Gy

Location : 1: BINA Headquarters farm, Mymensingh

Data to be recorded : Days to number of 50% silking, Plant height, ear height, ear length, ear diameter, number of rows/ear, number of kernels/rows, grain yield

Programme Area II: Varietal Improvement of Oilseed Crops

Project 1 Varietal improvement of rapeseed-mustard through induced mutations and other advanced breeding techniques

Objectives : Development of varieties with

- early maturity (70-80) and higher seed yield;
- non-shattering siliqua habit in *B. napus*;
- resistance/tolerance to *Alternaria* blight disease; and
- tolerance to salinity and drought.

- Personnel assigned** : Dr. Md. Abdul Malek, PSO & Head (PI)
 Dr. Reza Md. Emon, SSO
 Mst. Khadija Khatun, SO
 Syed Zakir Hossain, ASO
 M. A. Halim, SA-I
 S. M. Mahbulul Alam, SA-II
- Status** : Two mutant/lines were found promising in respect of maturity period along with some others improved yield components. Some other early maturing and high yielding mutants/lines in different generations have also been selected, which need further trials.

Experimental details

Yield and Adaptive Trials

Experiment 35 : **On-station and on-farm yield trials with advanced rapeseed mutant/line (CCTF funded)**

- Objectives : To assess overall performance of the mutants/lines for earliness, seed yield and reaction to *Alternaria* blight disease
- Mutants and check : 4, 2 mutants/line (MM-64 and RC-9) + 2 check
- Growing season : Last week of October 2015 to February 2016
- Optimum sowing time : 25 October to 15 November
- Design with replication : RCB with three replications
- Locations : 13 (BINA Headquarters farm, Mymensingh, BINA sub-station farms at Ishurdi, Magura, Rangpur, Satkhira and Chapainawbabganj and farmers' field at Tangail, Manikgonj, Ishurdi, Magura, Rangpur, Satkhira and Chapainawbabganj)
- Unit plot size : 5 m × 4 m
- Total land requirement : 380 m² (19 m × 20 m) per location
- Data to be recorded : Days to flowering, days to maturity, plant height, branches/plant, siliquae/plant, siliqua length, seeds/siliqua, population/plot, 1000-seed weight, plot yield and reaction to major insect-pests and diseases

Experiment 36 : **Zonal yield trial with advanced M₉ *B. napus* mutants**

- Objectives : To assess overall performance of the mutants for earliness, seed yield and reaction to *Alternaria* blight disease
- Mutants and check : 4, 2 mutants (MM-210 and MM-211) + 2 check
- Growing season : Late October 2015 to February 2016
- Optimum sowing time : 25 October to 15 November
- Design with replication : RCB with three replications
- Locations : 4 (BINA sub-station farms at Ishurdi, Magura, Rangpur and Satkhira)
- Unit plot size : 5 m × 4 m
- Total land requirement : 380 m² (19 m × 20 m) per location
- Data to be recorded : Days to flowering, days to maturity, plant height, branches/plant, siliquae/plant, siliqua length, seeds/siliqua, 1000-seed weight, plot yield and reaction to major insect-pests and diseases.

Experiment 37	:	On-station yield trial with advanced M₈ <i>B. juncea</i> mutants
Objectives	:	To assess overall performance of the mutants for earliness, seed yield and reaction to <i>Alternaria</i> blight disease
Mutants and check	:	4, 3 mutants (MM-35, MM-36 and MM-37) + 1 check
Growing season	:	Late October 2015 to February 2016
Optimum sowing time	:	25 October to 15 November
Design with replication	:	RCBD with 3 replications
Locations	:	3 (BINA sub-station farms at Ishurdi, Magura and Rangpur)
Unit plot size	:	4 m × 3 m
Total land requirement	:	256 m ² (16 m × 16 m) per location
Data to be recorded	:	Days to flowering, days to maturity, plant height, branches/plant, siliquae/plant, seeds/silique, 1000-seed weight, plot yield and reaction to major insect-pests and diseases

Handling of Segregating Materials

Experiment 38	:	Growing of F₆ lines from cross between Binasarisha-4 and Tori-7
Objectives	:	To select stable and desirable lines
Growing season	:	Late October 2015 to February 2016
Optimum sowing time	:	25 October to 15 November
Total number of lines	:	22
Design with replication	:	Non-replicated
Locations	:	2 (BINA Headquarters farm, Mymensingh and BINA sub-station farm at Rangpur)
Total land requirement	:	160 m ²
Data to be recorded	:	Days to flowering, days to maturity, plant height, branches/plant, siliquae/plant, seeds/silique, 1000 seed weight, plot yield and reaction to major insect-pests and diseases
Experiment 39	:	Growing of M₄ population
Objectives	:	To select desirable mutants with early maturity
Growing season	:	Late October 2015 to February 2016
Optimum sowing time	:	25 October to 15 November
Design with replication	:	Plant-progeny rows
Total land requirement	:	200 m ²
Data to be recorded	:	Selection only
Experiment 40	:	Growing of M₂ generation
Objectives	:	To select early maturing mutants
Growing season	:	Late October 2015 to February 2016
Optimum sowing time	:	25 October to 15 November
Design with replication	:	Plant-progeny rows
Total land requirement	:	200 m ²
Data to be recorded	:	Selection only
Experiment 41	:	Growing of F₂ generation from crossing of Binasarisha-4 with Tori-7, BARI Sarisha-14 and BARI Sarisha-15
Objectives	:	To select early maturing lines
Growing season	:	Late October 2015 to February 2016
Optimum sowing time	:	25 October to 15 November
Total land requirement	:	200 m ²
Data to be recorded	:	Selection only

Materials Development

- Experiment 42** : **Growing of M₁ generation**
Objectives : To create genetic variability
Varieties and doses : Four varieties (BARI Sarisha-14 & 15, Sampad and Tori-7) and 5 doses of gamma rays (400, 500, 600, 700 and 800 Gy)
Growing season : Late October 2015 to February 2016
Optimum sowing time : 25 October to 15 November
Locations : BINA Headquarters farm, Mymensingh
Total land requirement : 500 m²
Data to be recorded : % germination of seeds, 15 and 25-day old seedling height, root-shoot length and leaf area

Experiment 43 : **Growing of F₁ generation from crossing of Binasarisha-4 with Tori-7, BARI Sarisha-14 & 15**

- Objectives : To develop early maturing and high yielding rapeseed lines
Growing season : Late October 2015 to February 2016
Optimum sowing time : 25 October to 15 November
Total land requirement : 150 m²
Locations : BINA Headquarters farm, Mymensingh

Experiment 44 : **Crossing Binasarisha-4 with Tori-7, BARI Sarisha-14 & 15**

- Objectives : To develop early maturing and high yielding rapeseed lines
Growing season : Late October 2015 to February 2016
Optimum sowing time : 25 October to 15 November
Total land requirement : 80 m²
Locations : BINA Headquarters farm, Mymensingh

Maintenance Breeding

Experiment 45 : **Maintenance of germplasm**

- Objectives : To maintain breeding materials
Total number : 50
Growing season : Late October 2015 to February 2016
Optimum sowing time : 25 October to 15 November
Locations : BINA Headquarters farm, Mymensingh and sub-station farm, Magura
Total land requirement : 200 m²
Data to be recorded : Days to maturity, seed yield and yield contributing characters

Project 2 : **Varietal improvement of groundnut through mutation and other advanced breeding techniques**

- Objectives** : To develop varieties with
- early maturity (120-130 days);
- drought, salinity, high/low temperature tolerances; and
- multiple resistance/tolerance to diseases and insect pests

- Personnel assigned** : Dr. M. A. K. Azad, PSO (PI)
Mrs. Fahmina Yasmine, SSO
Mr. Md. Kamruzzaman, SO
Mr. Sadequr Rahman, SA-I
Mr. Habibur Rahman, SA-I

- Status** : Some M₄ mutants with different desirable traits

Experimental details

Yield and Adaptive Trials

Experiment 46	: Observation trial with M₄ population of groundnut
Objective	: To assess yield potential and earliness
Growing season	: December 2015 to June 2016
Population	: 20
Unit plot size	: 1.5 × 2.0 m ²
Total area	: 30 × 6.0 = 180 m ²
Design and replication	: RCBD with 3 replications
Location	: BINA Headquarters farm, Mymensingh
Data to be recorded	: Plant height, primary branch, pod number, 100-pod weight, and pod yield/plot

Handling of Segregating Materials

Experiment 47	: Growing of M₂ generation of groundnut
Objective	: To screen early maturing mutants with higher number of pods/ plant
Growing season	: December 2015 to June 2016
Mutants and parents	: 180 M ₂ population and 1 parent
Design with replication	: Plant progeny rows
Location	: BINA Headquarters farm, Mymensingh
Total area	: 200 m ²
Data to be recorded	: Plant height, primary branch, pod number, 100-pod weight, 100-kernel weight, shelling %, pod yield/ha

Maintenance of germplasm

Experiment 48	: Maintenance of mutant germplasm
Objective	: To maintain the mutant germplasm
Growing season	: January to June 2016
Mutant /lines/germplasm	: 40
Design and replication	: Non-replicated
Location	: BINA Headquarters farm, Mymensingh
Data to be recorded	: True to type plants of the variety/mutant/genotype will be harvested and bulked

Project 3 : Varietal improvement of sesame through induced mutation and other advanced breeding techniques

Objective(s)	: Development of early maturing varieties with - higher seed yield potential; - tolerant to water-logged condition; - tolerant to salinity and drought; and - non-shattering capsule habit
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Personnel assigned	: Dr. Md. Abdul Malek, PSO & Head (PI) Dr. M. Imtiaz Uddin, SSO Dr. Reza Md. Emon, SSO Mst. Khadija Khatun, SO Syed Zakir Hossain, ASO M. A. Halim, SA-I S.M. Mahbulul Alam, SA-II
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Status	: Four advanced mutants (SM-08 SM-09, SM-058 and SM-067) were found promising in respect to higher seed yield which need further evaluation. Some other early generation mutants were also found promising in respect to higher seed yield potential which need further evaluation.
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Experimental details

Yield and Adaptive Trials

- Experiment 49** : **On-farm and on-station yield trials with promising sesame mutants (CCTF funded)**
- Objectives : To select mutants for improved yield components, higher seed yield and earliness
- Varieties/mutants : 5, 4 mutants (MM-058, MM-08, MM-09 & MM-067) and 1 check
- Growing season : Late February to May 2016
- Optimum sowing time : 20 February to 15 March
- Design with replication : RCB with 3 replicates
- Locations : On-station: 5 (BINA sub-station farm, Ishurdi, Magura, Chapainawbabganj, Satkhira and Khagratori) and On-farm: 5 (Farmers' field at Ishurdi, Magura, Jessore, Faridpur, Khulna, Chapainawbabganj, Satkhira and Khagratori)
- Unit plot size : 5 m × 4 m
- Total land requirement : 500 m² (25 m × 20 m) per location
- Data to be recorded : Days to 50% flowering & maturity, plant height, no. of branches/plant, no. of capsules/plant, no. of seeds/capsule, capsule length, 1000-seed weight and seed yield per plot and reaction major diseases and insect-pests
- Experiment 50** : **Preliminary yield trial with promising M₅ sesame mutants**
- Objectives : To select mutants for improved yield components, higher seed yield and earliness
- Varieties/mutants : 11 (9 mutants and 2 check)
- Growing season : Late February to May 2016
- Optimum sowing time : 20 February to 15 March
- Design with replication : RCB with 3 replicates
- Locations : 5 (BINA sub-station farm, Ishurdi, Magura, Chapainawbabganj, Satkhira and Khagratori)
- Unit plot size : 2.5 m × 4 m
- Total land requirement : 500 m² (25 m × 20 m) per location
- Data to be recorded : Days to 50% flowering & maturity, plant height, no. of branches/plant, no. of capsules/plant, no. of seeds/capsule, capsule length, 1000-seed weight and seed yield per plot and reaction major diseases and insect-pests
- Experiment 51** : **Screening of sesame mutants/lines for salinity tolerance (CCTF funded)**
- Objective : To assess level of tolerance under salt stress
- Growing season : Late February to May 2016
- Treatments : 12 mutants/lines (salinity stress: 0mM, 60mM, 80mM and 100mM of NaCl for BINA Headquarters farm, Mymensingh)
- Design and replication : RCBD with three replication
- Locations : BINA Headquarters farm, Mymensingh and Farmers' field at Satkhira and Khulna
- Unit plot size : Pot experiment for Mymensingh, 3m × 2.5m for Satkhira and Khulna
- Total area : 12m × 30m
- Data to be recorded : Morpho-physiological parameters related to salinity stress and yield and yield contributing characters

Handling of Segregating Materials

- Experiment 52** : **Growing of M₂ population**
Objectives : To select early maturing and stable mutants with higher yield
Growing season : Late February to May 2016
Optimum sowing time : 20 February to 15 March
Total land requirement : 200 m²

Materials Development

- Experiment 53** : **Growing of M₁ generation**
Objectives : To create variability for selection of desirable mutants
Growing season : February – May 2016
Data to be recorded : Selection only
Doses : 3 doses (400, 500 and 600 Gy) and control
Optimum sowing time : 20 February to 15 March
Locations : BINA Headquarters farm, Mymensingh and BINA sub-station at Magura
Total land requirement : 200 m²/location

- Experiment 54** : **Crossing within Binatil-1, 2 & 3 and BARI Til-4**
Objectives : To develop early maturing and high yielding sesame lines
Growing season : Late February to May 2016
Optimum sowing time : Late February to 15 March 2016
Total land requirement : 80 m²
Locations : BINA Headquarters farm, Mymensingh

Maintenance Breeding

- Experiment 55** : **Maintenance of germplasm**
Objectives : To maintain breeding materials for future uses
Total number : 25
Growing season : Late February to May 2016
Optimum sowing time : Late February to 15 March 2016
Locations : BINA sub-station farm Magura and Ishurdi
Total land requirement : 200 m²/location
Data to be recorded : Days to maturity, seed yield and yield contributing characters.

Project 4 : **Varietal improvement of soybean through induced mutation**

- Objective(s) : Development of soybean varieties with
– early maturity and high seed yield potential;
– having longer period of seed viability;
– resistance/tolerance to major diseases and insect-pests; and
– tolerance to salinity and drought

- Personnel assigned** : Dr. Md. Abdul Malek, PSO & Head (PI)
Dr. M. Imtiaz Uddin, SSO
Dr. Reza Md. Emon, SSO
Mst. Khadija Khatun, SO
Syed Zakir Hossain, ASO
M. A. Halim, SA-I
S. M. Mahbubul Alam, SA-II

- Status** : Four advanced mutants were found promising regarding maturing period along with improved yield components.

Experimental details

Yield and Adaptive Trials

- Experiment 56** : **On-station and on-farm yield trials with M₉ soybean mutants (CCTF funded)**
- Objectives : To select early maturing and high yielding mutants as varieties
- Lines and check : 6, 4 mutants (SBM-9, SBM-15, SBM-18 & SBM-22) and 2 check
- Growing season : Kharif-II: July – October 2015 and Rabi: January – April 2016
- Optimum sowing time : Kharif-II: 1 July – 15 August, Rabi: 1-15 January
- Design with replication : RCB with 4 replications
- Locations : Kharif-II: 4 (BINA Headquarters farm, Mymensingh, BINA sub-stations at Rangpur, Ishudrdi, Magura and Chapainawbabganj) and Rabi: 8, On-station: 5 (BINA Headquarters farm, Mymensingh, BINA sub-stations at Magura, Satkhira, Comilla and Noakhali) and On-farm: 3 (farmers' field at Chandpur, Laxmipur and Noakhali)
- Unit plot size : 5 m × 4 m
- Total land requirement : 600 m² (25 m × 24 m) per location
- Data to be recorded : Days to flowering & maturity, plant height, no. of branch/plant, pods/plant, pod length, seeds/pod, 100-seed weight, plot seed yield and reactions to major diseases and insect-pests
- Experiment 57** : **Screening of soybean varieties/mutants/lines for salinity tolerance (CCTF funded)**
- Objective : To assess level of tolerance under salt stress
- Growing season : Rabi: January - April 2015
- Treatments : 15 mutants/lines (salinity stress: 0, 60, 80 and 100mM of NaCl)
- Design and replication : CRD for Mymensingh and RCBD with three replications Satkhira and Khulna
- Locations : BINA Headquarters farm, Mymensingh and Farmers' field at Satkhira and Khulna
- Unit plot size : Pot experiment for Mymensingh, 3m × 2.5m for Satkhira and Khulna
- Total area : 12m × 39m
- Data to be recorded : Morpho-physiological parameters related to salinity stress and yield and yield contributing characters

Handling of Segregating Materials

- Experiment 58** : **Growing of M₃ population**
- Objectives : To select early maturing mutants
- Growing season : Kharif-II: July - October 2015 and Rabi: January - April 2016
- Optimum sowing time : Kharif-II: 1 July - 15 August, Rabi: 1-15 January
- Total land requirement : 200 m²
- Location : BINA Headquarters farm, Mymensingh and BINA sub-station Magura
- Experiment 59** : **Growing of M₂ population**
- Objectives : To select early maturing mutants
- Growing season : Rabi: January - April 2016
- Optimum sowing time : Rabi: 1-15 January
- Total land requirement : 200 m²
- Location : BINA Headquarters farm, Mymensingh

Materials Development

Experiment 60

- Objectives : **Growing of M₁ generation**
- Varieties and doses : To create variability for selection of desirable mutants
- Growing season : 3 varieties with 4 radiation doses (150, 200, 250, 300 and 350 Gy)
- Optimum sowing time : Twice a year (Kharif-II: July -October 2015 & rabi: Jan. - April 2016)
- Locations : Kharif-II: 15-31 July 2015 and Rabi: 1-15 January 2016
- Total land requirement : BINA Headquarters farm, Mymensingh
- Data to be recorded : 300 m² (approx.)
- : Date of sowing, % germination of seeds, % survival of plants at 30, 60, 90 days after sowing and at maturity, collection of first formed 10 pods/plant

Maintenance Breeding

Experiment 61

- Objectives : **Maintenance of local and exotic germplasm**
- Germplasm lines : To maintain the germplasm for future utilization
- Growing season : 35 (approx.)
- Optimum sowing time : Twice a year (July-October 2014 & January-April 2016)
- Design with replication : Kharif-II: 15-31 July 2015 and Kharif-I: 1-31 January 2016
- Locations : Non-replicated, 5 m long row, 3 lines per germplasm
- : BINA Headquarters farm, Mymensingh & BINA sub-station farm, Magura
- Total land requirement : 120 m² (Approx.) per location
- Data to be recorded : Days to flowering & maturity, seed yield and yield contributing characters and reaction to major diseases and insects-pests and salinity

Project 5

Objectives

Personnel assigned

Status

: Development of semi dwarf and high yielding sunflower varieties through induced mutation

- : To develop varieties/mutant lines with
 - Dwarf plant height
 - higher seed yield and
 - tolerances to major diseases and pests

- : Fahmina Yasmine, SSO (PI)
- Dr. M. A. Malek, PSO & Head
- Dr. Md. Imtiaz Uddin, PSO
- Md., Kamruzzaman, SO

: New

Sunflower (*Helianthus annuus* L.) appears to be the only crop which can play a crucial role in supplementing our local oil production due to its high yield potential, high edible oil contents, drought resistance, salt tolerance and alteration in the present cropping pattern. Being a short duration crop (90-110 d), it can be grown effectively twice a year under irrigation as well as rain fed conditions. Presence of genetic variability is assessed as a first step for the development of high yielding and better adapted varieties/ hybrids. The yield is about 760 kg per hectare. It takes about 90-110 days for harvesting. Sunflower production available in All over Bangladesh mainly in Noakhali and Rajshahi. The 5th major oil seed crop in Bangladesh. Most of the sunflower varieties cultivated in Bangladesh are long stature, lodging occurs and causes yield losses. So we need to develop a semi dwarf type and high yielding variety.

Experimental details

Experiment 62

- : Collection and Evaluation of local/exotic sunflower cultivars**
- Objective : To assess yield potential and other morpho-physiological attributes
- Treatments : 20 cultivars/land races
- Design and replication : Non-replicated
- Locations : BINA Hq farm, Mymensingh,
- Data to be recorded : Days to flowering and maturity, plant height, internodal length, and leaf area, number of leaves per plant, head diameter, stem girth, percentage of filled achenes, 100 achene weights, and achene yield per plant

Experiment 63

- : Irradiation of selected sunflower cultivars and growing of M₁ populations.**
- Objective : To create variability
- Treatments : 3 landraces , doses: 100 Gy,150Gy and 200Gy
- Design and replication : Non- replicated
- Location : 1: BINA Headquarters farm, Mymensingh
- Data to be recorded : days to flowering, days to maturity, plant height, internodal length, and yield per plant

Programme Area III : Varietal Improvement of Pulse Crops

Project 1 : Varietal improvement of mungbean using mutation breeding techniques

- Objective(s) : To develop varieties of summer mungbean with
 - high yielding;
 - early maturity;
 - resistance/tolerance to MYMV, CLS, PM diseases and pod borer insect (collaboration with Plant Pathology and Entomology division); and
 - resistance/tolerance to weather damage (for summer mungbean only)

- Personnel assigned : Dr. Shamsun Nahar Begum, SSO (PI)
Dr. Mirza Mofazzal Islam, PSO
Mr. Md. Ferdous Iqbal, SO
Mr. Md. Abdus Sobhan, ASO
Md. Abdur Rahman, SA-I

- Status : Few mutants of summer mungbean were selected from ZYT and other generations.

Experimental details

Yield and Adaptive Trials

Experiment 64

- : On-farm and on-station trial of two promising summer mungbean mutants (CCTF funded)**
- Objective(s) : To assess overall performance of the mutants in respect of earliness, higher seed yield and disease tolerance
- Growing season : January – June 2016
- Design with replications : RCBD with 3 replications
- Treatment(s) : 2 mutants and 2 check varieties
- Location(s) : On-station: 3 (BINA sub-stations at Magura, Ishurdi and Barisal) and
On-farm: 3 (Farmers' field at Magura, Ishurdi and Natore)

Unit plot size : 5 m × 4 m
 Total area : 300 m² (approx.)
 Data to be recorded : Days to flowering, days to maturity, plant height, no. of branches, no. of pods/plant, pod length, no. of seeds/pod, 100 seed wt., total number of plants/plot, seed yield/plot and disease reaction

Experiment 65 : **Advanced yield trial of some promising summer mungbean mutants**

Objectives : To select desirable mutants and assess overall performance of the mutants for earliness, seed coat colour, seed yield and disease reaction
 Treatment(s) : 6: 4 mutants and 2 check varieties
 Growing season : January – June, 2016
 Design with replication : RCBD with 3 replications
 Locations : Magura, Natore, Ishurdi and Barisal
 Unit plot size : 4 m × 2.5 m
 Data to be recorded : Days to flowering, days to maturity, plant height, no. of pods/plant, pod length, no. of seeds/pod, 100 seed wt., seed yield/plot, total number of plants/plot and disease reaction

Handling of Segregating Materials

Experiment 66 : **Growing of M₃ generation of mungbean**

Objectives : To select desirable mutants
 Treatment : 72 plants/lines
 Growing season : January - June 2016
 Design with replications : Plant progeny rows
 Locations : BINA sub-station farm at Ishurdi
 Total land requirement : 260 m²
 Data to be recorded : Days to flowering, days to maturity, plant height, no. of pods/plant, pod length, seeds/pod, 100 seed wt., seed yield/plant and disease

Experiment 67 : **Growing of M₂ generation of mungbean**

Objectives : To create variability for selection of desirable mutants
 Growing season : January-June 2016
 Treatment : 215 plants
 Design with replications : Plant progeny row
 Locations : BINA sub-station farm at Ishurdi
 Total land requirement : 200 m²
 Data to be recorded : Days to flowering, days to maturity, plant height, no. of pods/plant, pod length, seed chambers/pod, seeds/pod, 100 seed wt. and seed yield/plant

Materials Development

Experiment 68 : **Growing of M₁ population of irradiated seeds of yellow seed coated mutants of summer mungbean**

Objectives : To develop yellow shiny seed coated, high yielding and disease free/tolerant mungbean mutants
 Growing season : January-June 2016
 Treatment : 3 mutants, doses: 400, 450 and 500Gy
 Design with replications : Non-replicated
 Locations : BINA sub-station farm, Ishurdi
 Total land requirement : 150 m²
 Data to be recorded : All seeds will be collected from each plants

Experiment 69 : **Crossing of yellow seed coated mungbean mutants with existing varieties and AVRDC lines**

Objectives : To develop yellow shiny seed coated, high yielding and disease free/tolerant mungbean mutants

Growing season : January - June 2016

Treatment : Yellow seed coated mutants, Binamoog-8, BARI Mung-6 and AVRDC lines

Design with replications : Non-replicated

Locations : BINA Headquarters farm, Mymensingh

Maintenance Breeding

Experiment 70 : **Maintenance of local and exotic germplasm**

Objective(s) : To maintain breeding materials

Growing season : January-June 2016

Design with replications : Not applicable

Varieties/mutants : 25

Location(s) : BINA Headquarters farm, Mymensingh

Unit plot size : 5 m long row

Total land requirement : 175 m²

Data to be recorded : Days to maturity, seed yield and yield contributing characters.

Project 2 : **Varietal improvement of chickpea for problem areas through induced mutations**

Objective(s) : Development of varieties for –
- dry and saline areas with higher or acceptable seed yield;
- resistance/tolerance to grey mold (*Botrytis sp.*), root rot and wilt diseases (Collaboration with Pathology Division);
- resistance/tolerance to pod borer and cut worm (Collaboration with Entomology Division); and
- Kabuli type for diseases resistant and higher yield

Personnel assigned : Dr. Shamsun Nahar Begum, SSO (PI)
Dr. Mirza M. Islam, PSO
Md. Ferdous Iqbal, SO
Md. Abdus Sobhan, ASO
Mrs. Ferdousi Begum, ASO
Nirmal Kumar Dey, SA-II

Status : Some promising mutants /lines were selected from different generations.

Yield and Adaptive Trial

Experiment 71 : **Zonal yield trial of some promising mutants of chickpea**

Objective(s) : To select high yielding variety(s) of chickpea with large seed size and early maturity, disease and insect pest reaction

Growing season : November, 2015 – April 2016

Treatments : 2 mutants + 2 checks (Binasola-4 and Barisola-6)

Design with replications : RCBD with 3 replications

Location : Godagari (Barind), Ishurdi and Magura sub-station farm

Unit plot size : 4 m × 3 m

Total area : 275 m² (each location)

Data to be recorded : Days to flowering, days to maturity, plant height, branches/plant, pods/plant, seeds/pod, 100-seed wt, and seed yield/plot

Experiment 72 : Advanced yield trial of some promising mutants of chickpea

Objective(s) : To select high yielding variety(s) of chickpea with large seed size and early maturity

Treatments : 3 mutants/lines + 2 checks (Binasola-4 and Barisola-6)

Design : RCBD with 3 replications

Growing season : November 2015 – April 2016

Location : Godagari (Barind) and Magura sub-station farm

Unit plot size : 4 m × 2.5 m

Total area : 450 m²

Data to be recorded : Days to flowering, plant height, days to maturity, branches/plant, pods/plant, no. of seeds/pod and seed yield/plot, disease and insect pest reaction

Materials Development

Experiment 73 : Growing of M₁ population of chickpea

Objectives : To develop mutant with high yielding, high protein, attractive seed coat colour, disease tolerant/resistant

Growing season : November 2015 – April 2016

Treatment : 3 (2 varieties + Kabuli chickpea), doses: 300, 350 and 400 Gy

Design with replications : Non-replicated

Locations : Rajshahi/Ishurdi

Project 3 : Varietal improvement of lentil through induced mutation

Objectives : Development of varieties for

- dry areas with good seed yield/acceptable seed yield;
- super earliness (65-80 days) to fit rice based cropping pattern;
- higher nutritional quality (Protein, Fe, and Zn); and
- earliness (95-110 days), higher yield and resistance/ tolerance to collar rot, root rot/wilt, *stemphylium* blight and rust diseases (collaboration with Plant Pathology Division)

Personnel assigned : Dr. Snigdha Roy, SSO (PI)
Dr. M. A. Malek, PSO & Head
Mrs. Ferdousi Begum, ASO
Md. Shahidullah, SA-1
Nirmal kumar Dey, SA-II

Status : One accession was found promising in respect of drought tolerance and seed yield. Other four mutant lines (LM-75-4, LM-5(4)-4-2, LM-6(3)-28 and LM-123-7) were selected as promising for seed yield. Apart from these accessions, some promising mutant lines are in advanced yield trials

Yield and Adaptive Trials

Experiment 74 : On-farm and on-station yield trial with lentil mutants/line (CCTF funded)

Objectives : To assess the yield potential of the lines on farmer's field condition

Growing season : November 2015 – March 2016

Treatments : 6 (4 mutants/line and Binamasur-6, and BARI Masur-7 as check)

Design with replications : RCBD with three replications

- Locations : 12 (BINA sub-stations, Ishurdi, Magura, Chapainawbabganj, Farmers' field at Ishurdi (1), Magura (1), Chapainawbabganj(2), Rajshahi (2), Natore (1), Nachol(2) and Jessore)
- Unit plot size : 10 m × 10 m
- Total area : 730 m²
- Data to be recorded : Days to maturity, plant height, no. of primary branches/ plant, no. of pods per plant, 100-seed weight, seed yield /1 m² and seed yield/plot

Experiment 75 : Advanced yield trial of some promising lines of lentil

- Objectives : To assess the yield potential of the accessions
- Growing season : November 2015 – March 2016
- Treatments : 7 (6 mutants and 1 check)
- Design with replications : RCBD with three replications
- Locations : 3 (BINA sub-stations, Ishurdi, Magura and chapainabgonj)
- Unit plot size : 4 m × 3 m
- Total area : 230 m² per location
- Data to be recorded : 50% flowering, days to maturity, plant height, no. of primary branches/plant, no. of pods/plant, 100-seed weight and seed yield/plot

Experiment 76 : Preliminary yield trial of some promising lines of lentil

- Objectives : To assess the yield potential of the accessions
- Growing season : November 2015 – March 2016
- Treatments : 9 (7 mutants and Binamasur-5 and LG-115 as check)
- Design with replications : RCBD with three replications
- Locations : 2 (BINA sub-stations, Ishurdi and Magura)
- Unit plot size : 3 m × 1.2 m
- Total area : 50 m² per location
- Data to be recorded : Days to maturity, plant height, no. of primary branches/ plant, no. of pods per plant, 100-seed weight and seed yield /plot

Experiment 77 : Screening of drought tolerance using polyethylene glycol

- Objectives : To identify drought tolerant lines
- Growing season : November 2015-March 2016
- Treatments : 10 (9 mutants and 1 check)
- Design with replications : RCBD with three replications
- Locations : BINA Headquarters
- Medium : Hydroponic system in nutrient media
- Data to be recorded : Plant height, number of leaf node, fresh root weight, fresh shoot weight dry root and shoot weight after drought induction

**Experiment 78 : Elite Nursery, Early (LIEN-E-16)
Elite Nursery, Micronutrient Nursery (LIMN-16)
Drought Tolerance Nursery (LIDTN-16)**

Handling of Segregating Materials

Experiment 79 : Screening of M₃/M₄ population of lentil

- Objectives : To select early, drought resistant and higher nutrient enriched mutants with higher seed yield
- Growing season : November 2015 – March 2016
- Population : 150 Gy, 200 Gy, 250 Gy and 300 Gy gamma ray treated population along with the parent
- Design and replication : Non-replicated
- Locations : Ishurdi and Magura Sub-station
- Total land requirement : 300 m² per location
- Data to be recorded : Days to maturity, plant height, no. of primary branches/ plant, no. of pods per plant, 100-seed weight and seed yield /plot

- Experiment 80** : **Screening of M₂ population of lentil**
- Objectives : Selection of high yielding early mutants
- Growing season : November 2015 – March 2016
- Population : 150Gy, 200Gy and 250Gy gamma ray treated population along with the parent
- Design with replications : Plant-progeny-row
- Locations : Magura sub-station
- Total land requirement : 300 m²
- Data to be recorded : 1st flowering, days to maturity, plant height, no. of primary branches/plant, no. of pods per plant, 100-seed weight and seed yield /plant

Materials Development

- Experiment 81** : **Growing of M₁ population of lentil**
- Growing season : November 2015 – March 2016
- Varieties : BARI Masur-7 and Binamasur-5, LG-115, 208
- Doses : 4 doses (150, 200, 250, 300 and 400 Gy) and controls
- Design with replications : Not applicable
- Locations : Magura sub-station
- Total land requirement : 300 m²
- Data to be recorded : % germination of seeds, % survival of plants at 30, 60, 90 days after sowing and at maturity, harvesting of individual plant separately

Maintenance Breeding

- Experiment 82** : **Maintenance of germplasm**
- Objectives : To maintain the lentil germplasm
- Growing season : November 2014 – March 2015
- Treatments : 10 lines having different characters
- Design with replications : Non-replicated
- Locations : 2 (BINA sub-station farms at Magura and Ishurdi)
- Unit plot size : 2 m long line with two rows
- Total area : 30 m² (Approx.)
- Data to be recorded : Plant height, no. of primary branches/plant, no. of pods per plant, 100-seed weight and seed yield /plot

Project 4 : **Varietal improvement of grasspea through induced mutation**

- Objectives** : Development of varieties with
- higher seed yield potential; and
- low ODAP content.
- Personnel assigned** : Dr. Snigdha Roy, SSO (PI)
Mrs. Ferdousi Begum, ASO
Mr. Shahidullah, SA-1
Nirmal kumar Dey, SA-II
- Status** : Twenty seven M₃ deviants have been selected for higher yield and further evaluation will be made in the next season

Handling of Segregating Materials

- Experiment 83** : **Screening of M₄ generation of grasspea**
- Objectives : To select high yielding low ODAP grasspea mutants
- Growing season : October 2014- March 2015
- Population : 250 Gy, 300Gy and 350Gy gamma ray treated population along with the parents

Design with replications : Plant-progeny-row
 Locations : Magura sub-station
 Total land requirement : 300 m²
 Data to be recorded : Flower color, plant height, branches per plant, pods per plant, seeds per pod, 100-seed weight and seed yield per plant and ODAP content

Experiment 84 : Segregating Population Nursery (GISPN-16)

Objectives : Selection of desirable lines

Materials Development

Experiment 85 : Growing of M₁ generation

Objectives : To create variability for selection of higher yield and low ODAP
 Growing season : November 2015 – March 2016
 Varieties : BARI Khesari-3
 Doses : 3 doses (250, 300 and 350 Gy) and control
 Design with replications : Not applicable
 Locations : Magura sub-station
 Total land requirement : 300 m²
 Data to be recorded : % germination of seeds, % survival of plants at 30, 60, 90 days after sowing and at maturity, harvesting of individual plant separately

Maintenance Breeding

Experiment 86 : Maintenance of grasspea germplasm

Objectives : To maintain the grasspea germplasm lines
 Growing season : October 2015 – March 2016
 Treatments : 10
 Design with replications : Non-replicated
 Locations : BINA sub-station, Magura
 Unit plot size : 2 m long line with two rows
 Total area : 30 m² (Approx.)
 Data to be recorded : -

Project 5 : Varietal improvement of blackgram through induced mutation

Objectives : Development of varieties with
 - higher seed yield;
 - erect plant type;
 - earliness and resistance/tolerance to YMV and CLS; and
 - synchrony in pod maturity.

Personnel assigned : Dr. Snigdha Roy, SSO (PI)
 Mrs. Ferdousi Begum, ASO
 Mr. Shahidullah, SA-1
 Nirmal kumar Dey, SA-2

Status : Seven advanced mutants were found promising in respect of seed yield which will be evaluated in the next season. Some other early generation mutants were also found promising in respect of higher seed yield

Yield and Adaptive Trials

Experiment 87 : **Preliminary yield trial with seven selected mutants of blackgram**

Objectives	: To select desirable mutants
Growing season	: September – December 2015
Treatments	: 10 (7 mutants + 3 control)
Design with replications	: RCBD with three replications
Locations	: Magura and Chapainawbabganj sub-stations
Total land requirement	: 312 m ²
Data to be recorded	: Days to maturity, plant height, branches per plant, pods per plant, seeds per pod, 100-seed weight and seed yield per plot

Handling of Segregating Materials

Experiment 88 : **Growing of M₃ generation**

Objectives	: To select desirable mutants
Growing season	: September – December 2015
Population	: 350 Gy, 400Gy, 450 Gy and 500 Gy gamma ray treated population along with the parents
Design with replications	: Plant-progeny-row
Locations	: BINA sub-station farm at Magura
Total land requirement	: 300 m ²
Data to be recorded	: Days to maturity, plant height, branches per plant, pods per plant, seeds per pod, 100-seed weight and seed yield per plant

Materials Development

Experiment 89 : **Growing of M₁ generation**

Objectives	: To create variability for selection of higher yield
Growing season	: September – December 2015
Varieties	: BARI Mash-3
Doses	: 3 doses (500, 600, 700 and 800 Gy) and control
Design with replications	: Not applicable
Locations	: Magura sub-station
Total land requirement	: 300 m ²
Data to be recorded	: Date of sowing, % germination of seeds, % survival of plants at 30, 60, 90 days after sowing and at maturity, harvesting of individual plant separately

Project 5 : **Varietal improvement of cowpea through induced mutation**

Objectives : Development of varieties with erect plant type, higher seed yield, earliness, and resistance/tolerance to YMV, CLS and synchrony in pod maturity

Personnel assigned : Dr. Md. Imtiaz Uddin, SSO (PI)
Dr. M. A. Malek, PSO & Head
Md. Mosharaf Hossain, ASO

Status : New

Yield and Adaptive Trials

Experiment 90 : Germplasm collection of locally growing different cowpea cultivars and evaluation for yield attributes

growing season	: (December 2015-May 2016)
Treatments	: 20 cultivars/land races
Design and replication	: Non-replicated
Locations	: BINA Headquarters farm, Mymensingh
Unit plot size	: 4.0 m ^ 2.5 m
Total area	: 100 m ² (approx.)
Data to be recorded	: Plant height, days to flower (50%, 90%), panicle length, no. of seeds pod, seed weight, days to maturity and seed yield (grain/plant)

Handling of Segregating Materials

Experiment 91 : Growing of M₂ populations of cowpea

Objective	: To select high yielding stress tolerant pear millet mutants
Growing season	: (December 2015-May 2016)
Treatments	: 3 landraces ,* irradiation doses need to be determined
Design and replication	: Non- replicated/Plant progeny
Location	: BINA Headquarters farm, Mymensingh
Unit plot size	: 5m × 4 m
Total area	: 20 m × 20m=400 m ²
Data to be recorded	: Plant height, days to flower (50%, 90%), panicle length, no. of seeds pod, seed weight, days to maturity and seed yield (grain/plant)

Materials Development

Experiment 92 : Growing of M₁ populations of cowpea

Objective	: To develop high yielding stress tolerant cowpea mutants
Growing season	: (December 2015 – May 2016)
Treatments	: 3 landraces , irradiation doses need to be determined
Design and replication	: Non-replicated
Location	: BINA Headquarters farm, Mymensingh
Unit plot size	: 5 m × 4 m
Total area	: 20 m × 10 m=200 m ²
Data to be recorded	: Plant height, days to flower (50%, 90%), panicle length, no. of seeds pod, seed weight, days to maturity and seed yield (grain/plant)

Programme Area IV : Varietal Improvement of Spices

Project 1 : Varietal improvement of onion using induced mutation

Objective(s) : To develop varieties with
- high yield potentiality;
- good seed set under unfavorable climatic conditions;
- longer storage capacity; and
- resistant/tolerant to leaf blotch and *Stemphyllum* blotch disease.

Personnel assigned : Dr. Md. Abul Kalam Azad, PSO (PI)
Mrs. Fahmina Yasmine, SSO
Md. Kamruzzaman, SO
Md. Sadequr Rahman, SA-I
Md. Habibur Rahman Mridha, SA-I
Mr. Amzad Hossain, SA-1

Status : Three summer onion mutants that can produce sufficient seeds even under foggy winter climatic conditions with longer storage ability are awaiting for release

Experimental details

Yield and Adaptive Trials

Experiment 93 : On farm and on-station trials using M₇ set for bulb yield potential in Kharif-II season

Objective	: To assess bulb yield potentials of the mutants
Growing season	: August to November 2015
Mutants/varieties	: 5 (3 Mutants and 2 check varieties)
Design with replication	: RCBD with 3 replications
Unit plot size	: 3.0 m × 1.0 m
Locations	: BINA sub-station farms at Ishurdi, Rangpur, Magura and Chapainawbabganjand Spices Research Center, Bogra
Data to be recorded	: Leaves/plant, plant height, bulb diameter, and individual bulb weight, bulb yield/plot (fresh and dry) and different nutrient contents.

Experiment 94 : On-farm and on station trials for seed yield potential of the M₈ mutants

Objective	: To assess seed yield potentials of the mutants in winter
Growing season	: September 2015 – April 2016
Mutants/varieties	: 4 (2 mutants and 2 check varieties)
Design with replication	: RCBD with 3 replications
Unit plot size	: 3.0 m × 2.0 m
Locations	: 4 (Farmer's field at Rajbari, Manikgonj, Natore and Rajshahi)
Data to be recorded	: Days to induction of bolting, first flower opening, number of umbels/plant, number of inflorescence/umbel, seed yield/plant, 1000 seed weight, and seed yield/ha.

Experiment 95 : Production of M₉ pure seed

Objective	: To multiply seed
Growing season	: September 2015 – April 2016
Varieties/mutants	: 3
Design with replication	: Non-replicated
Location	: 3 (BINA sub-station Ishurdi Rangpur and Chapainawbabganj)
Total area	: Approximately 100 m ² /mutant

Experiment 96 : Production of set from M₈ seeds

Objective	: To produce seed
Growing season	: Last week of January- May 2016
Varieties/mutants	: 5 (3 mutants and 2 check varieties)
Design with replication	: Non-replicated
Location	: BINA Headquarters farm, Mymensingh
Total area	: Approximately 20 m ² /mutant

Experiment 97 : On farm and on-station trials using M₉ seeds for bulb yield potential in Kharif-I season

Objective	: To assess bulb yield potentials of the mutants
Growing season	: June – November 2016
Mutants/varieties	: 4 (2 Mutants and 2 check varieties)
Design with replication	: RCBD with 3 replications
Unit plot size	: 3.0 m × 1.0 m
Locations	: BINA sub-station farms at Ishurdi, Rangpur, Magura and Chapainawbabganjand, Farmers' field at Bogra, Lalmonirhat and Jessore
Data to be recorded	: Leaves/plant, plant height, bulb diameter and individual bulb weight, bulb yield/plot (fresh and dry) and different nutrient contents.

Programme Area V : Varietal Improvement of Fiber Crops through Induced Mutation

Project 1 : Varietal improvement of tossa jute

Objective(s) : To develop high yielding variety with better quality fiber

Personnel assigned : Dr. Md. Abul Kalam Azad, PSO (PI)
Md. Hasanuzzaman, SO
Nirmal Kumar Dey, SA-II

Experimental details

Maintenance Breeding

Experiment 98 : Seed purification of a high fiber and stick yielding mutant line of tossa jute

Objectives : To produce pure seed

Growing season : May to December 2015

Mutant : 1: O₉₇/90/72-3

Design : Non-replicated

Total area : 100 m²

Locations : BINA Headquarters farm, Mymensingh

Data to be recorded : Seed yield

Handling of Segregation Materials

Experiment 99 : Growing of M₁ generation

Objectives : To create variation for high fiber and stick yield

Growing season : May to December 2015

Parent : Bankim

Gamma ray doses : Control, 700, 800, 900 and 1000 Gy

Total area : 100 m²

Locations : BINA Headquarters farm, Mymensingh

Data to be recorded : Germination, survival, seedling height at 7, 14 and 21 DAS and seeds from the survived plants

Maintenance Breeding

Production of Nucleus Seeds

Name of Crops and Varieties	Target of production (kg)	Location of seed production	Responsible breeders
RICE			
Iratom -24	5	BINA Farm, Mymensingh; BINA sub-sation farms at Jamalpur, Ishurdi, Rangpur, Magura, Nalitabari and Comilla	Dr. M. A. K. Azad, PSO Md. Hassanuzzaman, SO
Binasail	5		
Binadhan -5	5		
Binadhan -6	5		
Binadhan -7	50		
Binadhan-14	50		
Binadhan-18 (proposed)	10		
GROUNDNUT			
Binachinabadam-1	5	BINA Farm, Mymensingh	Dr. M. A. K. Azad, PSO Fahmina Yasmine, SSO Mr. Kamruzzaman, SO
Binachinabadam-2	5		
Binachinabadam-3	5		
Binachinabadam-4	50		
Binachinabadam-5	5		
Binachinabadam-6	10		
Binachinabadam-7	5		
Binachinabadam-8	10		
Binachinabadam-9	5		

Production of Breeder Seed

Name of Crops and Varieties	Target of production (kg)	Location of seed production	Responsible breeders
RICE			
Iratom -24	50	Mymensingh, Ishurdi, Jamalpur, Magura and Rangpur, Barisal, Comilla	Dr. M. A. K. Azad, PSO Md. Hassanuzzaman, SO
Binasail	100		
Binadhan -5	50		
Binadhan -6	50		
Binadhan -7	7000		
Binadhan-9	200		
Binadhan-14	2000		
Binadhan-18 (proposed)	500		
MUSTARD			
Safal	10	BINA Headquarters farm, Mymensingh, sub-stations at Ishurdi, Magura, Rangpur, Jamalpur, Comilla, Chapainawbabganjand Nalitabari, and farmers' field adjacent to these sub-stations	Dr.Md. Abdul Malek, PSO & Head Mrs. Khadija Khatun, SO
Agrani	10		
Binasarisha 3	50		
Binasarisha 4	1200		
Binasarisha-5	50		
Binasarisha-6	20		
Binasarisha-7	800		
Binasarisha-8	300		
Binasarisha-9	1000		
Binasarisha-10	1500		

Name of Crops and Varieties	Target of production (kg)	Location of seed production	Responsible breeders
GROUNDNUT			
Binachinabadam-1	20	08 (BINA Sub-stations- Ishurdi and Rangpur and Farmer's field at Jhenaidah, Kishoregonj, Lalmonirhat, Natore, Kuliarchar Debigonj, Bhaluka)	Dr. M.A.K. Azad, PSO Fahmina Yasmine, SSO Mr. Kamruzzaman, SO
Binachinabadam-2	20		
Binachinabadam-3	20		
Binachinabadam-4	10,000		
Binachinabadam-5	500		
Binachinabadam-6	2000		
Binachinabadam-7	200		
Binachinabadam-8	2000		
Binachinabadam-9	1000		
SESAME			
Binatil-1	1000	BINA Headquarters farm, Mymensingh, BINA sub-sub stations at Ishurdi, Magura, Jamalpur, Rangpur, Chapai Nowabgonj, Khagrachhori and farmers' field adjacent to these sub-stations, Jessore, Satkhira	Dr.Md. Abdul Malek, PSO & Head Dr. Md. Imtiaz Uddin, SSO Mst. Khadija Khatun, SO
Binatil-2	1000		
Binatil-3	500		
SOYBEAN			
Binasoybean-1	1000	BINA Headquarters, Mymensingh, BINA sub-stations at Ishurdi, Magura, Rangpur and Comill, and farmers' field a Trishal of Mymensingh, Chandpur and Noakhali	Dr. Md. Abdul Malek PSO & Head Dr. Md. Imtiaz Uddin, SSO Mst. Khadija Khatun, SO
Binasoybean-2	1500		
Binasoybean-3	300		
Binasoybean-4	200		
CHICKPEA			
Hyprosola	10	BINA sub stations, Magura and Ishurdi and farmers' field at Godagari, Rajshahi	Dr. S. N. Begum, SSO & Dr. Mirza M. Islam, PSO
Binasola-2	20		
Binasola-3	20		
Binasola-4	200		
Binasola-5	50		
Binasola-6	100		
Binasola-7	300		
Binasola-8	300		
MUNGBEAN			
Binamoog-1	100	Mymensingh and sub-stations, Magura and Ishurdi, Natore, Chapai Nowabgonj	Dr. S. N. Begum, SSO & Dr. Mirza M. Islam, PSO
Binamoog-2	50		
Binamoog-3	50		
Binamoog-4	100		
Binamoog-5	2000		
Binamoog-6	100		
Binamoog-7	100		
Binamoog-8	3000		
LENTIL			
Binamasur-2	100	BINA sub stations, Magura and Ishurdi, Chapainawabgonj and farmers' field at, Magura, Jessore, Ishurdi, Natore, Rajshahi and Chapainawabgonj	Dr. Snigdha Roy, SSO Dr. Md. Abdul Malek PSO & Head
Binamasur-5	800		
Binamasur-6	500		
Binamasur-7	300		
Binamasur-8	500		
Binamasur-9	300		

Name of Crops and Varieties	Target of production (kg)	Location of seed production	Responsible breeders
TOMATO		BINA farm, Mymensingh and sub stations at Ishurdi, Magura and Rangpur and Annex farm, Jamalpur.	Dr. Md. Abdul Malek, PSO, Dr. Md. Imtiaz Uddin, SSO Mohammad Ali, SO
Bahar	0.5		
Binatomato- 2	0.1		
Binatomato- 3	0.1		
Binatomato- 4	0.2		
Binatomato- 5	0.2		
Binatomato- 8	0.1		
Binatomato- 9	0.1		
Binatomato- 10	0.2		
GRASSPEA		BINA farm, Mymensingh and sub station, Ishurdi	Dr. S. N. Begum, SSO
Binakhesari-1	100		
BLACKGRAM		BINA farm, Mymensingh and sub stations, Ishurdi and Magura	Dr. Snigdha Roy, SSO
Binamash-1	100		
JUTE		BINA farm, Mymensingh and BINA Annex farm, Jamalpur	Dr. M. A. K. Azad, PSO Hassanuzzaman. SO
Atompat- 38	10		
Binadeshipat- 2	100		
Binapatshk-1	200		

Head of Plant Breeding Division

CSO (RC)

Director (Research)

**REQUEST FROM PLANT BREEDING DIVISION TO CARRY OUT
THE FOLLOWING STUDIES DURING 2015-2016**

Type of investigation	Crop	No. of mutants to be tested	To be carried out by the division
Optimum fertilizer requirement of some mutants of rice	Rice (T. Aman + Boro + Aus)	1+2+1 mutants	Soil Science
Assessing optimum spacing of Binadhsn-14	Rice (late Boro)	Binadhan-14	Agronomy
Determination of Amylose and protein content	Rice (Boro + T. Aman + Aus)	1+2+1 mutants	C.P. Division
Assessing physiological aspects of promising deep water rice mutants	Aman	4 mutants	C.P. Division
Assessing suitable mixed cropping practice for Aus (Kasalath) and deep water Aman rice in the haor and bill areas	Rice (Deep water Aman + Aus)	2+2 mutant lines	Agronomy
Screening against blast, BLB, sheath blight and stem rot	Rice (T. Aman + Boro+ Aus)	5+5+5 mutant lines	Plant Pathology
Relay cropping of wheat with T. Aman rice in saline areas	Wheat	1 mutant	Agronomy
Screening against diseases	Groundnut	20 mutants	Plant Pathology
Screening against insect pests	Groundnut	20 mutants	Entomology
Screening against major diseases & insect pest of chickpea	Chickpea	4 mutants	Plant Pathology and Entomology
Screening against major insect pests	Jute (<i>C. olitorius</i>)	1 mutant	Entomology
Screening against major diseases	Jute (<i>C. olitorius</i>)	1 mutant	Plant Pathology
Screening against major diseases & insect pests	Mustard-rapeseed	4 mutants/line + Binasarisha-9	Pathology and Entomology
Determination of optimum fertilizer requirement (major and micro-nutrients)	Mustard-rapeseed	4 mutants/line + Binasarisha-9	Soil Science
Determination of water requirement of advanced lines & mutants	Mustard-rapeseed	4 mutants/line + Binasarisha-9	Agril. Engg.
Screening against stem rot disease and major insect pests	Sesame	4 mutants (SM-08, SM-09, SM-058 & SM-067) and Binatil-3	Plant Pathology and Entomology
Determination of optimum water requirement	Sesame	4 mutants (SM-08, SM-09, SM-058 & SM-067), Binatil-3	Agril. Engg.

Type of investigation	Crop	No. of mutants/ varieties to be tested	To be carried out by the division
Determination of optimum spacing	Sesame	4 mutants (SM-08, SM-09, SM-058 & SM-067) and Binatil-3	Agronomy
Determination of optimum fertilizer requirement (major and micro-nutrients)	Sesame	4 mutants (SM-08, SM-09, SM-058 & SM-067) and Binatil-3	Soil Science
Screening against major diseases and insect-pests	Soybean	4 mutants and 2 check	Plant Pathology and Entomology
Determination of optimum spacing	Soybean	4 mutants and 2 check	Agronomy
Screening against CLS, MYMV, PM, pod borer and leaf hopper	Mungbean (summer)	5 mutants	Plant Pathology and Entomology
Screening against rust, root rot and blight in mutant lines	Lentil	7 mutant lines	Pl. Pathology
Determination of optimum spacing and seed rate	Lentil	LM-208	Agronomy
Screening M ₈ onion mutants against <i>Stemphyllum</i> and purple leaf blotch diseases	Onion	3 mutants (Summer)	Pl. Pathology
Optimum fertilizer requirement of summer onion	Onion	3 mutants	Soil Science
Optimum irrigation requirement of summer onion	Onion	3 mutants	Agril. Engg.
Devising low-cost shading for summer onion production	Onion	3 mutants	Agronomy

Head of Plant Breeding Division

CSO (RC)

Director (Research)