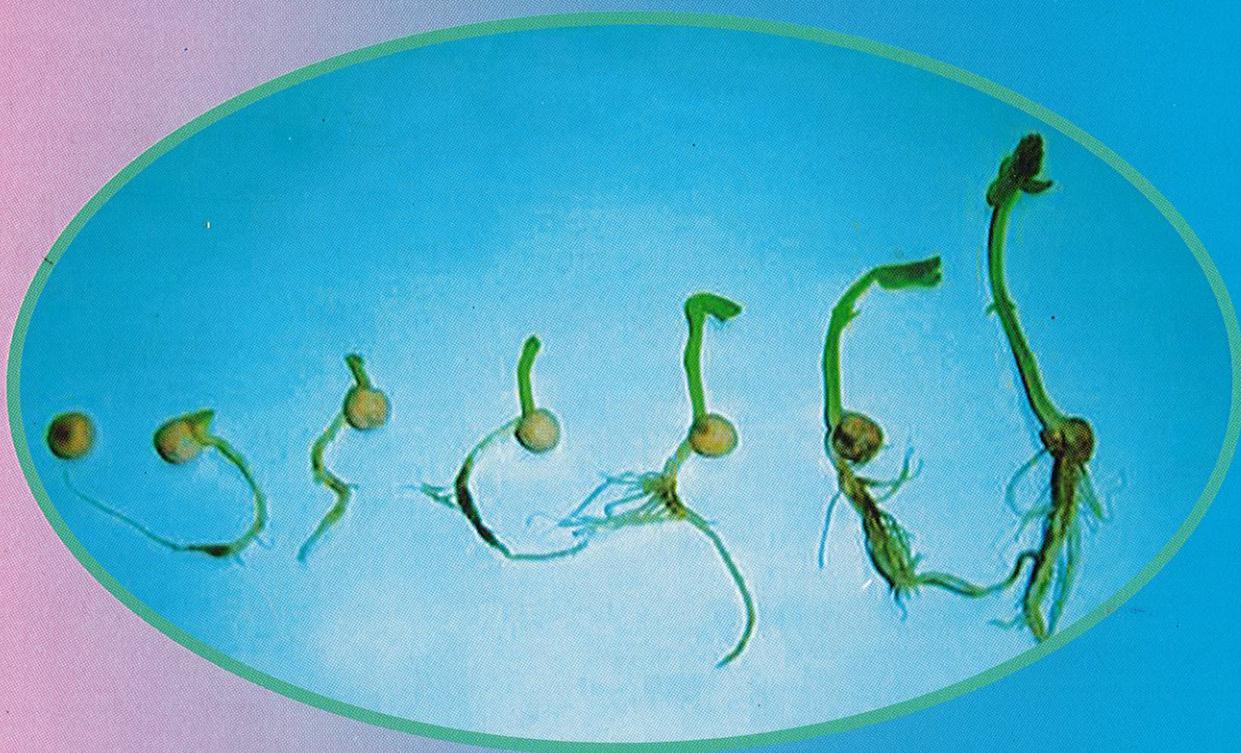


# RESEARCH ON SEED TECHNOLOGY

ABSTRACTS  
1998 - 2008



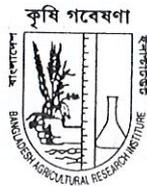
**Seed Technology Division**  
**Bangladesh Agricultural Research Institute**  
**Joydedpur, Gazipur-1701**

# RESEARCH ON SEED TECHNOLOGY

## ABSTRACTS 1998 - 2008

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## **EFFECT OF SHELLING METHODS ON SEED QUALITY OF MAIZE**

**M.R. Khan, M. Begum, M.M. Kamal and A. sattar**

The experiment was conducted at the field laboratory of Seed Technology Division, BARI, Joydebpur, Gazipur during 1998-1999 to identify the most suitable method of maize shelling for obtaining quality seed. The shelling methods were: i) Shelling by hand (farmers' practice), ii) Beating the dry cob with sticks (farmers' practice), iii) Improved BARI manual sheller, iv) Comilla-Cooperative manual sheller, v) Renwick manual maize sheller, vi) BARI power maize sheller and vii) Comilla Co-operative power sheller. Results showed that moisture content of seed had no effect on shelling. The minimum damage in seed was observed with manual hand shelling and maximum damage with electrical power sheller. Power shelling reduced the germination percentage (81%) and vigour index (1606). Manual hand sheller had higher germination (99%) and vigour index (3084).

## **EVALUATION OF PURITY OF FARMERS' MAIZE SEEDS THROUGH FIELD TEST**

**Firoza Begum, M. Begum and M.R. Khan**

The experiment was carried out at the laboratory and fields of Seed Technology Division, BARI, Joydebpur, Gazipur during 1998-99 to assess the status of the farmers produced maize seed in terms of physical and genetic purity. Twenty, 32, 20 and 3 maize seed samples from Dinajpur, Rajshahi, Rangpur and Joydebpur, respectively were collected as test materials. Moisture percentages of all the seed samples ranged from 12 to 18% and pure seed ranged from 96-100%, inert matter were 0 to 2% and other species seeds

were 0.01-0.05%. Germination percentage ranged from 34-100%. In the field, endosperm colours were white/ yellow/purple/chocolate. White and yellow colored endosperms were dominant. Cob colours ranged from 44 to 100% white and 9 to 40% red. Proportion of dent like grains were more compared to flint type. Stock deterioration of Khoibhutta and Barnali were 55 and 69%, respectively. Stock deterioration was also observed in the samples of Mohar.

#### **TIME OF HARVESTING OF INDETERMINATE TYPE OF COWPEA FOR SEED PURPOSE INFLUENCED BY PLANTING TIME**

**W. Sultana, R.R. Saha and M.M. Kamal**

The experiment was conducted at the research field of Regional Agricultural Research Station (RARS), Hathazari during rabi (winter) season of 1998-1999 to determine the most suitable harvesting cycle of cowpea for seed purposes related to planting date. Four dates of sowing viz. 15 November, 30 November, 15 December and 30 December were the treatment variables. Seeds were harvested at maturity and stored in tin containers and polythene bags after sun drying. Results revealed that the highest 1000-seed weight was obtained when sown on 15 November (first harvest). During storage, initial germination percentage of December sowing and second harvest was very low. Insect infestations varied due to differences of containers. Polythene bag showed better performance than tin container in respect of viability and insect infestation. Seeds collected from first and second harvest from November 15 sowing showed higher germination percentage and vigour in storage conditions.

## **EVALUATION OF SEED DAMAGE CAUSED BY EARLY RAINS AT THE TIME OF HARVEST OF WHEAT**

**A. Nessa, M.M. Kamal and W. Sultana**

The experiment was carried out at the laboratory of Seed Technology Division, BARI during rabi season of 1998-1999 to determine the degree of damage caused by early rainfall at the time of harvest and the suitable drying method of rain affected wheat seeds. Wheat seeds were collected from 50 farmers of Comilla district and stored in close cooperation with the DAE personnel. Data on germination percentage, moisture content and vigour index of the collected seeds were recorded. Results from the survey indicated that average farm area of the sample farmers was 1.08 ha and wheat cultivation area was 0.27 ha. About 10-15% farmer used their own stored seed and 58-80% from BADC seed. Only 20% farmers of Daudkandi were affected by rain at the time of wheat harvest while 80% in case of Chandina and Debidwar farmers. No farmers stored seeds of the rain affected crop for sowing in the following year. Rain caused damage to seed quality of wheat seeds during storage. Most of the farmers preserved their seeds after sun drying and tested the germination of the seeds before sowing in the following year.

## **STANDARDIZATION OF VIGOUR TEST OF WHEAT SEEDS**

**W. Sultana, M.R. Khan and A. Nessa**

The experiment was carried out at the laboratory of the Seed Technology Division, BARI during 1998-1999 to standardize a suitable method of vigour test of wheat for researchers, DAE field workers, seed

growers, farmers and for the seed industry in Bangladesh. Six different vigour tests viz. i) Speed of germination, ii) Seedling growth test, iii) Soaking treatment test, iv) Hiltner test, v) Accelerated aging test and vi) Tetrazolium test were selected in the study. Seeds of wheat (var. Kanchan) were collected from WRC, BARI and two farmers of Comilla district. Seeds of WRC had the highest vigour while farmers' seeds had the lowest. There was a positive correlation in respect of seedling emergence in the field with percent emergence of seedling in Hiltner test. Seedling growth test and Tetrazolium test also showed better correlation. Accelerated aging test indicated that aging procedure may not be perfect as the instrument for vigour test. Among the different methods, Hiltner test was the best to determine the seed vigour of wheat. Speed of germination method was found to be easier and consistent results can be obtained for vigour index.

#### **EVALUATION OF STORAGE METHODS FOR SEED QUALITY OF GROUNDNUT**

**W.Sultana, M.Begum, M.M.Kamal and M.R.Khan**

A survey was conducted during 1998-1999 on 100 groundnut growing farmers at Chitagong, Cox's Bazar, Noakhali and Patuakhali to identify the farmers' practice of groundnut seed storage and recommend the suitable storing methods under home storage conditions. On the basis of on-station trial and farmers' seed storage methods; an adaptive trial on storage was set up during May-June 1997 at farmers' houses of Ramu, Cox's bazar, Kishoreganj and Gopalganj. The treatments were: i) Tin container (BARI/CDP

recommended), ii) Tin container with polythene bag (farmers' practice), iii) Earthen motka with polythene bag, iv) Polythene-Jute bag/gunny bag and v) Polythene gunny bag with calcium chloride (ICAR, India). Five groundnut farmers were selected from each location. Results revealed that moisture content of the seeds of Kishoreganj farmers was higher than that of Gopalganj and Cox's Bazar. The germination ranged from 79% (Gopalganj) to 90% (Cox's bazar) which indicated that the storage conditions and containers of farmers were good.

**EFFECT OF LEAF DEFOLIATION ON YIELD AND YIELD CONTRIBUTING  
CHARACTERS OF MUNGBEAN IN RELATION TO NODAL POSITION  
AND POSITION OF SEED IN POD**

**M.Begum, W.Sultana and A. Hamid**

An experiment was conducted in pots and at field conditions of BARI, Joydebpur, Gazipur to study effect of defoliation on seed size, germination and yield of mungbean in relation to nodal position and position of seed in pod of mungbean. There were four treatments such as T<sub>1</sub> (control, no leaf removal), T<sub>2</sub> (4 leaves removed from the lower part of the plant), T<sub>3</sub> (4 leaves removed from the upper part of the plant) and T<sub>4</sub> (8 leaves removed from both upper and lower part of the plant). In pot experiment, the highest number of pods/plant was produced from T<sub>2</sub> treatment. The highest seed weight was also significantly higher (38 mg) from T<sub>2</sub> treatment compared to the other three treatments. Nodes-7 produced significantly the highest yield irrespective to all the treatments except T<sub>3</sub>. The highest yield/plant (20 g) was obtained from T<sub>2</sub>

treatment followed by T<sub>1</sub> (15.82 g), T<sub>3</sub> (14.37 g) and T<sub>4</sub> (11.94 g), respectively. Germination percentage also varied significantly and the highest germination (77%) was obtained from T<sub>2</sub>. There was no significant difference in germination percentage of seed from two positions as distal and near ends of pod. Similar yield trend was observed in field conditions where the highest yield (1.18 t/ha) was produced by T<sub>2</sub> treatment.

#### **A SURVEY OF THE STATUS OF WHEAT SEED USED BY FARMERS AND CONSTRAINTS ON THE USE OF QUALITY SEED**

**M.R.Khan, A.Sufian, M.G.Faruque and M.M.Kamal**

A survey was conducted in two locations (Joydebpur and Dinajpur) for collecting wheat grain samples from farmers during crop season to justify Seed Technology Research related to wheat seed production of farmers. A survey was also conducted using the same questionnaire across 120 farmers at Dinajpur, Rangpur, Rajshahi, Pabna, Jamalpur and Joydebpur with the help of DAE. Irrespective of locations, most of the farmers relied on BADC/local market/neighbour/other sources. All the collected seeds were tested for seed moisture before storing. Germination was about 89%. Most of the growers/farmers dried their seeds 2 to 5 times and used polyethylene bags covered with gunny bag and tin containers for their seed preservation. About 76-100% farmers used their own preserved seeds. Moisture content, germination percentage and 1000-seed weight at farm level ranged from 9-12%, 82-91% and 40-42 g, respectively.

## **SURVEY OF THE STATUS OF MAIZE SEED USED BY FARMERS AND CONSTRAINTS ON THE USE OF QUALITY SEEDS**

**M.M.Kamal, M.Begum and M.Islam**

A survey was conducted with a questionnaire having 25 questions to get detailed information directly from the farmers about seed and seed related problems of maize and formulate seed technology research progress on maize seed. A total 60 maize farmers were selected from Rangpur, Rajshahi, Jessore, Dhaka and Rangamati with the help of DAE. Farm size varied in different locations and the lowest farm size under maize cultivation was found in Rangamati followed by Dhaka district. Most of the farmers (69%) in Jessore district used Barnali variety while Khaibhutta and local varieties at Rangpur, Rajshahi and Dhaka. The highest respondents from Rangamati and Rajshahi districts used their own preserved seeds. Shelling by hand is the most common practice in all the locations. Irrespective of locations, 100% farmers stored their seeds in metal container in Dhaka and 100% Rangamati farmers preserved their seed by hanging the cobs. In Jessore, 47% farmers used polylined gunny bag and 88% farmers of Rangpur used polylined dole for seed storage. The biting method is a popular for moisture determination in all locations. About 63-80% farmers tested their seeds for germination quality. All the sampled seeds were good in terms of germination (>80%) and moisture content (12%).

## **EFFECT OF DIFFERENT THRESHING METHODS ON SEED QUALITY OF WHEAT**

**M.R. Khan, M. Begum and M.M. Kamal**

The experiment was conducted at the field laboratory of Seed Technology Division, BARI, Joydebpur, Gazipur to evaluate the different methods of threshing in respect of mechanical damage and the performance of different threshers used in wheat threshing. After harvesting, the different threshing methods viz. i) hand beating with sticks ii) bullock treading iii) pedal threshing (BARI thresher) iv) power threshing were used. An additional power threshing methods i.e. haggi was included for threshing Kanchan variety. Results showed that during threshing, the moisture content of variety Akbar and Kanchan were 12%. After sun drying, it was 11.0-11.8% (initial), which increased up to 13.8% in the Kanchan seed which was treated by power tiller Haggi during July. Moisture content of the other treatments did not show any marked difference. In all the treatments, germination percentage initially ranged from 85-90% and increased up to 92-99% in July. In both the varieties, threshing by power tiller caused more breakage in seed than bullock treading and hand beating. Likewise, the embryo damage percentage was more with power threshing and the least where the seeds were threshed just after harvesting. Vigor index increased after 2 months of storage. The variation in germination percentage was pronounced when the seeds were collected after treating with different threshers.

## EVALUATION OF STORAGE METHODS FOR QUALITY MUNGBEAN SEED

**W. Sultana, B. L. Nag and M. R. Khan**

A survey among 100 farmers from Barisal, Patuakhali and Noakhali was conducted during 1999-2000 to identify the farmers' practices of mungbean storage and observe comparative performance of different methods of storage. Mungbean seeds (cv. Barisal local) were collected from the farmers of Barisal region and maintained 8% moisture content. The seeds were stored with the following methods: i) Earthen motka (farmers' practice), ii) Tin container (farmers' practice), iii) Polythene gunny bag, iv) Earthen motka (coaltar coating inside and the motka outside polished with mustard oil for three times and dried up (CDP), v) Improved tin container (recommended by Post-Harvest Technology Division, BARI), vii) Earthen motka with ash viii) Earthen motka with neem leaves, ix) BARI tin container with neem leaves and x) CDP motka with ash. Before storage, the germination percentage of mungbean seeds was 99%. The highest germination rate (98.67%) was observed with earthen motka with neem leaves followed by earthen motka with ash (86.0%). The lowest germination rate (75%) was recorded with polythene gunny bag. Percent loss of seed increased with increasing insect population and disease infestation. The maximum loss (26.07%) was recorded with polythene gunny bag followed by earthen motka i.e. farmers' practice (20.51%) and only tin containers (19.85%). The highest seed vigour was obtained in earthen motka with ash and the lowest from farmers' practice (earthen motka). Moisture content of the stored seed increased. The highest moisture absorption was occurred with polythene gunny bag because that seed was infested and damaged by insect pests.

## **ADAPTIVE STORAGE TRIAL OF WHEAT SEEDS**

**M. R. Khan, M. Begum, M. M. Kamal and A. Nessa**

A survey was carried out during 1999-2000 in wheat growing areas of Netrokona and Kishorganj Sadar to study the farmers' practice and the status of the recommended wheat seed storage methods. In each location, 30 farmers were interviewed and a follow-up trial with wheat variety Kanchan was conducted at the survey areas. The storage methods were: i) Storage in motka (farmers' practice), ii) Tin container, iii) Polylined jute bag (WRC recommended) and iv) Polylined Jute bag with neem leaves. It is revealed that initial moisture and germination percentage of stored seed of Netrokona sodar were 11 and 82%, respectively. Among the containers, motka had more moisture content (12.0-13.9%) than the other methods irrespective of locations. Seeds stored in polylined gunny or jute bag with neem leaves had higher germination (80-95%) compared to other methods in both the locations. Seeds of Netrokona had the maximum seed vigour index (1753) while Kishorganj seeds had the lowest (707).

## **EFFECT OF SHELLING METHODS ON SEED QUALITY OF MAIZE**

**M. R. Khan, M. Begum, M. M. Kamal and A. Sattar**

The experiment was carried out during 1999-2000 to standardize the maize shelling methods and protect seeds from being loss and damage. The shelling methods were: i) Beating, ii) Power sheller (Comilla Co-operative), iii) Manual maize sheller (BARI) and iv) Manual maize sheller (Renwick). It is

noted that the highest moisture content (12.4%) of seeds were found from beating method followed by Comilla power sheller (12.3%). Both the manual sheller (BARI and Renwick) had relatively low moisture content (11.9 and 11.7%, respectively). Germination percentage of maize seeds had no significant variation among the treatments and it was 92% in each treatment. Mechanical damage of seeds was higher in beating method (1.253 g/100 g seeds) than other methods. BARI manual sheller performed the best in respect of vigour index (2378).

### **EFFECT OF STORAGE METHODS ON MAIZE SEED VIABILITY**

**M. R. Khan, M. Begum, M. M. Kamal, W. Sultana and A. A. Miah**

An adaptive storage trial was set up in 10 farmers' houses at Dinajpur and Rangpur during 1999-2000 to determine the suitable method of storage for maize seeds at home storage condition. Seeds of maize (var. Barnali) were collected from Plant Breeding Division, BARI and tested for the following treatment: i) Seed stored with moth ball in tin container, ii) Cobs stored in tin container, iii) Cobs hanging in the kitchen, iv) Seed stored in polylined jute bags with neem leaves, v) Seeds stored in polylined jute bags, vi) Seed stored in polylined motka and vii) Cobs stored with moth ball in tin container. Results showed that initial moisture content of the seeds was 11-12%. Prior to seed storage, the germination and vigour index were 96% and 2552, respectively. The different storage methods had pronounced effect on different aspects of seed quality. The highest moisture content (14.4%) was noticed in the seeds kept open in the kitchen. The other methods (12.2-12.4%) did not

show any significant difference. At the end of storage, seeds or cobs with moth ball in tin container recorded the maximum germination (85%) and minimum from hanging cobs in the kitchen. The highest vigour index (2048) was recorded from cobs stored with moth ball in tin container followed by seeds stored with moth ball in tin container (1973).

## **EFFECT OF STORAGE METHODS ON SEED VIABILITY OF SOYBEAN**

**A. Nessa, W. Sultana and M. M. Kamal**

The experiment was conducted at the laboratory of Seed Technology Division during 1999-2000 after collecting the seeds of soybean (var. Bragg) from farmers through a survey and from Oilseed Research Center, BARI to identify the suitable farmers' methods of storing soybean seed and validate those methods against the recommended practices by BARI and other respective organization. The treatments were: i) Cotton bag inside tin at half meter depth of soil, ii) Cotton bag inside tin at one meter depth of soil, iii) Double polythene bag inside the tin, iv) Double polythene bag in tin container with  $\text{CaCl}_2$ , v) Cotton bag inside sealed tin container and vi) Cool room storage. Prior to storage, the moisture content, germination and vigour index of the seeds were 13.1%, 99% and 7.52, respectively. Initial and after storage moisture contents of the farmers' seeds ranged from 11.2-18.3% and 11.8-17.5%, respectively. Initial germination of the seeds at different methods was 97%, whereas after storing, it reduced to 83%. About 22% sample seeds had more than 70% germination and 10% had good vigour.

## QUALITY OF MUSTARD SEED AS INFLUENCED BY FERTILIZER APPLICATION

**M. M. Kamal, M. Biswas, M. R. Khan, M. G. Moula and A. A. Miah**

An experiment was conducted at the farmer's field at Sherpur during rabi season of 1999-2000 to study the effect of fertilizer on seed quality of mustard. The treatments included in the experiment were: i)  $N_{120}P_{80}K_{80}S_{30}B_2Zn_4$ , ii)  $N_{120}P_{80}K_{80}S_{30}B_0Zn_0$ , iii)  $N_{120}P_{80}K_{80}S_{30}B_0Zn_4$ , iv)  $N_{120}P_{80}K_{80}S_{30}B_0Zn_0$ , v)  $N_{120}P_{80}K_{80}S_0B_2Zn_4$ , vi)  $N_{120}P_{80}K_{80}S_0B_2Zn_0$ , vii)  $N_{120}P_{80}K_{80}S_0B_0Zn_4$ , viii)  $N_{120}P_{80}K_{80}S_0B_0Zn_0$ , ix)  $N_0P_0K_0S_{30}B_2Zn_4$ , x)  $N_0P_0K_0S_{30}B_2Zn_0$ , xi)  $N_0P_0K_0S_{30}B_0Zn_4$ , xii)  $N_0P_0K_0S_{30}B_0Zn_0$ , xiii)  $N_0P_0K_0S_0B_2Zn_4$ , xiv)  $N_0P_0K_0S_0B_2Zn_0$ , xv)  $N_0P_0K_0S_0B_0Zn_4$  and xvi)  $N_0P_0K_0S_0B_0Zn_0$  kg/ha. Seeds of BARI Sarisha-8 were sown on 16 November 1996. Application of NPK had significant effect on number of pods/plant, 1000-seed weight and seed yield/ha. Seed yield increased significantly due to application of S, B and Zn fertilizer. The highest seed yield (1986 kg/ha) was obtained from 120-80-80-30-2-4 NPKSBZn kg/ha treatment and the lowest from control plot (106 kg/ha). It is indicated that lack of any one of those nutrients could reduce the seed yield. In case of seed quality, the highest germination rate (95%) and vigour index (817) were observed where 120-80-80-30-2-4 kg NPKSBZn/ha was applied. The lowest germination (76%) and vigour index (538) were from the control treatment and in absence of micronutrients. It is noted that S, B and Zn has impact on seed quality of mustard.

## INFLUENCE OF TEMPERATURE STRESS ON WHEAT SEEDLINGS

W. Sultana, A. Nessa, M. Saifuzzaman, M. R. Khan and A. A. Miah

A laboratory experiment was conducted at the Seed Technology Division, BARI during 1999-2000 to screen the temperature tolerance of wheat varieties/crossing block (CB) lines. Sixteen wheat variety/crossing block lines viz. CB-4, CB-11, CB-13, CB-31, CB-45, CB-46, CB-49, CB-56, CB-73, CB-76, CB-78, CB-80, CB-86, CB-95, CB-102 and Sougat were included in the experiment. Six temperature treatments were: T<sub>1</sub>) 20°C continuous, T<sub>2</sub>) 25°C continuous, T<sub>3</sub>) 30°C for two hours, T<sub>4</sub>) 35°C for two hours, T<sub>5</sub>) 40°C for two hours, T<sub>6</sub>) 45°C for two hours, T<sub>7</sub>) 30°C for two hours + 40°C for two hours. For T<sub>3</sub>, T<sub>4</sub>, T<sub>5</sub>, T<sub>6</sub> and T<sub>7</sub> treatments, seeds were imbibed 48 hours in Petridishes at temperature ( $\pm 22^\circ\text{C}$ ) and then placed in germinator having the required temperature for two hours. It is revealed that CB-102 had the highest germination (94.3%) and Sougat had the lowest (75.6%) irrespective of temperature treatments. Temperature treatments at 20 and 25°C performed the best in respect of seedling growth. T<sub>4</sub> and T<sub>5</sub> treatments exhibited statistically similar germination. T<sub>6</sub> treatment had lower germination in all CB lines. However, effects of T<sub>4</sub>, T<sub>5</sub> and T<sub>6</sub> treatments were less effective on CB lines 4, 86 and 102. Germination as well as shoot and root length decreased gradually with the increase in temperature. The temperature between 20-25°C could be more appropriate for wheat seed germination.

**STUDIES ON GRAIN GROWTH, MATURITY PATTERN AND STORAGE QUALITY OF COWPEA (*Vigna anguiculata* L.) SEED**

**M. Begum, W. Sultana, M. M. Kamal and A. A. Miah**

The experiment was conducted at the research field of Seed Technology Division, BARI during 1999-2000 to determine the grain growth pattern and seed quality of cowpea at storage. Seeds of two varieties of cowpea viz. Hathazari local (indeterminate type) and HAE-16 (determinate type) were sown on 5 December 1996. Pods were collected from the sixth day of anthesis up to the 25<sup>th</sup> day at an interval of two days for the determination of the seed development pattern. Seeds were counted and oven dried at 80°C ± 50°C for a constant weight. After harvest, seeds were stored for the determination of storage quality. Seed development pattern for the indeterminate type starts on the sixth day after anthesis. Seed dry weight increased progressively over time attaining the highest at 20<sup>th</sup> day after anthesis and continued till maturity. Moisture content of the seeds reduced progressively. Seed germination initiated at 12 day after anthesis and rate of germination increased with the advancement of time. The highest rate of germination was recorded on the 20<sup>th</sup> day and thereafter it declined. The grain growth pattern of HAF-16 was almost similar to that of the Hathazari local. Grain dry weight of HAF-16 increased progressively up to 28 day of anthesis. The initial moisture content of this variety was higher and reduced onwards. Variety HAF-16 had high germination at 20 day after anthesis and thereafter decreased. Seed yield (1665 kg/ha) of Hathazari local was higher than that of HAF-16 (1125 kg/ha).

## **PHENOLOGICAL DEVELOPMENT OF MUNGBEAN UNDER DIFFERENT CLIMATIC CONDITIONS**

**M. Begum, M. M. Kamal, and A. A. Miah**

The experiment was carried out at Joydebpur during 1999-2000 to determine the effect of day degree on plant growth, development and observe the variation of yields of mungbean at different temperature regimes. Three planting dates (August, October and February) and three varieties (Kanti, NM-92 and BARI mung-3) were used as treatment variables. Planting time has a considerable influence on the phase development of mungbean. Days to flower initiation, anthesis, physiological maturity and harvesting stages took maximum time in February planting and minimum in August planting. The cause of longer period in February planting was due to low temperature which leads to lower accumulation of day degrees (Thermal heat unit). Plant height, leaf area development and dry matter accumulation was higher in February and August plantings than that of October planting. All the varieties had more number of pods/plant when sown in February that might have helped higher yield.

## **DORMANCY PERIOD IN DIFFERENT CULTIVARS OF WHEAT AND TRITICALE**

**M. Begum and M. R. Khan**

The experiment was conducted at the laboratory of the Seed Technology Division, BARI during 1999-2000 to determine the temporary dormancy period of different wheat and triticale varieties after harvest. Wheat varieties viz. Kanchan, Protiva, Akbar, Aghrani, Sonalika, Gourab, Sourab,

BAW-917, BAW-923 and BAW-936 and one variety of triticale (BAT-1) were collected from Wheat Research Centre and one variety of wheat (Kanchan) from BADC and farmers field (Jessore). Initial moisture contents of the collected wheat and triticale seeds were 12.07-14.14%. Seeds were stored in tin container with moisture content ranged from 11 to 12%. Seeds collected from the research center showed also a similar trend in case of germination. Immediate after harvest, germination rate was 50 percent for the first two weeks and then it increased gradually up to the 7<sup>th</sup> week and onwards. However, all the wheat varieties showed more than 90 percent germination. Seeds of Kanchan variety collected from BADC and farmers field, Jessore showed almost similar trend of germination. Initial dormancy remained up to the 3<sup>rd</sup> week and thereafter it increased from 4<sup>th</sup> to 7<sup>th</sup> week. Results revealed that triticale variety showed initial dormancy period of three weeks in first year and four weeks during second year and then germination increases gradually up to the 7<sup>th</sup> week and ranged from 80-90 percent.

**EFFECT OF SEED TREATMENT WITH FUNGICIDE AND INSECTICIDES ON  
SEED BORNE FUNGI, STORAGE INSECT PEST, SEED VIABILITY AND  
SEEDLING VIGOUR OF MUNGBEAN**

**M. Begum, M. Nasiruddin, T. K. Dey and M. R. Khan**

The experiment was conducted at the laboratory of Seed Technology Division during 1999-2000 to find out the possibility of using a single chemical as seed protectant for controlling both fungi and insects and the influence of seed treatments, and their interaction on seed borne fungi, pests, seed viability besides seedling vigour of mungbean. The treatments and the

amount of the chemicals applied in the experiment were: i) Vitavex @ 3 g/kg seed (fungicide), ii) Diazinon @ 0.98 g/kg seed (insecticide), iii) Moth ball @ four balls/kg of seed (repellant) and Neem soil @ 8 ml/kg, iv) Sand (1:1) as conventional method, v) Diazinon + Vitavex, vi) Chalk powder + Diazinon and vii) Control. Germination test continued under laboratory condition after one month storage. Germination percentage ranged between 86-96% among the treatments and the highest was recorded from the seed treatment with Diazinon + Chalk powder. Significant reduction in germination rate (78-82%) was noticed at 6 months intervals. Abnormal seedling percentage increased when the seeds were germinated after 6 months irrespective of treatments. On the other hand, hard seed percentage reduced when the seeds were treated with different chemicals except Neem oil treatment. Seed treatment only with Vitavex increased the number of hard seeds after storage. Seed treatment with Vitavex plus Napthalane proved to be effective to reduce both fungi and insects and also hard seed number over time.

#### **EFFECT OF SEED POSITION IN THE CAPITULUM OF SEED QUALITY OF SUNFLOWER**

**A. Nessa, M. M. Kamal, M. R. Khan and W. Sultana**

The experiment was conducted at the research field of Seed Technology Division; BARI during rabi season of 1999-2000 to investigate the seed set pattern and quality of seeds whorl wise from periphery to the centre of the capitulum. Seeds were collected from peripheral, middle and central position separately of each capitulum after sun drying. Results showed that higher germination percentage at different periods (88-90%) was recorded when the seeds were collected from the peripheral region. The germination

percentage was increased with the time of storage. However, initial germination was low due to the presence of temporary dormancy. Seedling dry matter (0.117 g/plant) was higher for the seeds from peripheral region than that of the middle (0.0869 g/plant) and the central position (0.080 g/plant). Seeds from peripheral region had higher vigour index (5.152) than that of middle (3.652) and central position (5.068). Thousand seed weight was also higher for the seeds of the peripheral region (62.492g) and seeds from the central portion had the lowest seed weight (50.07 g). The extent of seed development from the peripheral to the inner whorl possibly due to the photosynthetic translocation mechanism in the sunflower capitulum.

#### **COMPARATIVE STUDY ON EFFICIENCY OF MOBILIZATION OF SEED RESERVE IN MAIZE**

**A. Nessa, M. R. Khan and W. Sultana**

The experiment was carried out at the laboratory of Seed Technology Division, BARI during 1999-2000 to determine the efficiency of seed reserve utilization during seed germination affected by temperature regimes. Five maize varieties viz. Mohor, Khoibhutta, Barnali, BARI Maize-5 and BARI Maize-6 were used as experimental materials in this experiment. Germination test was done under two temperature regimes at 20° C and room temperature (28-32°C). After five days, seeds were separated into shoot, root and the residual seed weight recorded. However, seed metabolic efficiency (SME) was calculated as  $SME = SHW + RTW/RESP$ . Amount of seed material respired (RESP) was calculated as  $RESP = SDW - (SHW + RTW + RSW)$  where SDW = seed dry weight before germination, SHW = shoot dry weight,

RTW = root dry weight and RSW = remaining seed dry weight. It is noted that higher the value of SME, lower the efficiency of seed metabolic rate. Because, higher seed reserves were utilized for producing roots and shoot. Seed dry weight, root dry weight, shoot dry weight and residual seed weight of the seedling and the amount lost as respiration were lower at 20°C than that of room temperature. Results revealed that the rate of respiration was lower at low temperature than that of high temperature i.e. mobilization of food reserve was slow at low temperature. All the maize varieties showed higher metabolic efficiency at higher temperature.

#### **EFFECT OF SEED SIZE ON THE YIELD AND SEED QUALITY OF SOYBEAN**

**M. R. Khan, A. Nessa, M. Begum, S. A. Begum and O. F. Tarafdar**

The experiment was conducted at the research field of Seed Technology Division, BARI, Joydebpur, Gazipur during rabi season of 2000-2001 to evaluate the influence of seed size on the yield and seed quality of soybean (var. G-2). The seeds were graded into four groups viz. bulk seed i.e. non-graded (57.5 g/1000 seed), small (49.6 g/1000 seed), medium (62 g/1000 seed) and large (92.2 g/1000 seed). The graded seeds were sown in the field on 5 December 2000. Seeds were sown in line with a spacing of 40 cm x 5 cm. Result showed that large sized seeds produced significantly higher seed yield (2.38 t/ha), 1000-seed weight (68.45 g), number of seeds/pod (6.6) and pods/plant (96.0) compared to other seed sizes. Significant effect was observed in seed quality of soybean due to seed size in terms of germination, seedling dry weight and vigour index. Higher percent of germination (99%) and vigour index (47140) were also obtained from large sized seeds.

## FLOODING EFFECT ON MAIZE AT SEEDLING STAGE

S.A.Begum, W.Sultana, M.R.Khan and A.Nessa

Six varieties of maize viz. Barnali, Khoi Bhutta, Mohor, BARI Maize-5, BARI Maize-6 and BARI Hybrid maize-1 were tested during 2000-2001 to examine the relative susceptibility of maize to flooding at seedling stage. Hundred seeds of each cultivar having 85% germination were sown in one cm depth in soil. Seedlings of 8 days were submerged with water for 24, 48, 72 and 96 hours except control treatment (without submerged). Seedling length and dry weight were measured after 96 hours. Different varieties of maize showed significant effect on the seedling characters due to submergence duration. The longest root (13.11 cm), shoot (48.60 cm) and higher shoot dry weight (1.378 g) were recorded from Mohor. The highest root-shoot ratio (29.46) was obtained from BARI Maize-6 followed by Khai Bhutta, Barnali and BARI Maize-5 and the lowest (27.70) from BARI hybrid Maize-1. Root length increased with the increasing of submergence time. Similar trend was observed in case of root dry weight. The highest shoot length (59.68 cm) was found from the control treatment. Root-shoot ratio was maximum in 24 hours. Interaction between maize varieties and duration of submergence revealed that significantly the highest root length (15.66 cm) was recorded in BARI Maize-5 with the submergence duration of 24 hours. On the contrary, shoot length 63.78 cm was noted in BARI Maize-6 with the control treatment and the lowest from (36.94 cm) BARI hybrid Maize-1 with 24 hours submergence.

## **RESPONSE OF NaCl TO SEEDLING ATTRIBUTES OF WHEAT AND BARLEY**

**S. A. Begum, M. R. Khan, A. Nessa, M. Begum and M. Shalimuddin**

The experiment was conducted at the Seed Technology Laboratory of BARI, Gazipur during 2000-2001 to identify the saline tolerant barley and wheat genotypes. Seeds of eleven wheat varieties (Protiva, Seri, Akbar, Sónalika, Ananda, Kanchan, Pavon, Inia, BAW 966, Gourav and Sourav) and twelve barley varieties/lines (Karan-163, BARI barley-1, BHV-105, Bel-20, IBON-97/72, IBON-97/11, L-1, IBYT-97/5, IBYT-96/22, BYT-95, BYT-96/19 and Karan-19) were studied for the experiment. One hundred seeds of each entry were germinated in sand. Measurement of seedling length was taken on the 8<sup>th</sup> day. Five levels of NaCl concentrations (0, 10, 15, 20 and 25 mhos/cm) were used. Germination percentage, root and shoot length, root and shoot dry weight, root-shoot ratio and vigour index were significantly influenced by different varieties of wheat and barley. Germination percentage, root and shoot length, root and shoot dry weight and vigour index were decreased gradually due to increasing in NaCl concentrations. Root-shoot ratio gradually increased with the increment of NaCl concentrations. Interaction between wheat varieties and different concentrations of NaCl revealed that the highest percentage of germination was obtained from Gourav with the control treatment followed by Ananda and Protiva. In case of barley, maximum germination was obtained from IBON-97/11 with the control treatment followed by IBON-97/72, BYT-95 and BARI Barley-1.

**STATUS OF ONION SEED USED BY FARMERS AT DIFFERENT  
LOCATION IN BANGLADESH**

**M.R. Khan, S.A. Begum, A. Nessa, M. Begum and O.F. Tarafdar**

Surveys were conducted in different districts of Bangladesh from 2000 to 2002 crop seasons to study the storage practices and the quality of farmers' produced onion seeds. The first phase of the survey was done on production and storage practices of onion seeds adopted by the farmers of Rajshahi, Faridpur, Dinajpur, and Thakurgoan districts using pre-designed questionnaires with the help of DAE personnel. A simple questionnaire was used to interview 71 farmers of each of the location from whom the seeds were collected. The sample seeds were stored and data on moisture, germination, purity and infestation were recorded at the end of each storage. The second phase involved the pre and post storage evaluation of the seed quality like moisture content, percent purity, percent germination, weight of 1000-seeds, vigor and health status. After threshing and cleaning, farmers sun dried their seeds (usually 2 to 6 days) and stored. Before storing, they tested the moisture percentage of seeds through biting or pressing. For germination tests, the respondent farmers use copra (cocunut), leaf sheath of banana or soil. Rajshahi (88%) and Dinajpur (80%) farmers preserved seeds in tin containers after 2-3 days. But 68% and 55% Farmers stored their seed in motka of Faridpur and Thakurgao, respectively. Most of the farmers in all locations do not use chemical during storage. Germination status of sample seeds was better at Rajshahi (60%) than that of Faridpur (46%), Dinajpur (38%) and Thakurgoan (36%). Moisture percent ranged from 5.01 to 5.9%.

Germination percentage gradually increased up to September (i.e. storage condition) and thereafter decreased. After storage, germination percentage was maximum in Dinajpur (92%) but the seeds were infected by different fungi species like *Aspergillus*, *Fusarium*, *Alternaria* etc. Moisture content was the highest in seeds collected from Thakurgaon (9.49%) and minimum in Dinajpur (6.06%). Thousand seed weight was maximum in Rajshahi (3.07 g) followed by Dinajpur (3.01 g). Purity percentage of onion seed was maximum in Faridpur (99%) followed by Rajshahi (96%) and minimum in Dinajpur (92%).

**SEED QUALITY IN RELATION TO SEED DETERIORATION UNDER  
ACCELERATED AGEING CONDITIONS IN DIFFERENT LINES OF CHILLI**

**S. A. Begum, M. R. Khan, A. Nessa and O. F. Tarafdar**

An experiment was conducted at Joydebpur, Gazipur during 2001-2002 to study the effect of certain changes associated with loss of viability during accelerated ageing. Seeds of different lines of chilli viz. 2067, 2068, 2069, 2070, 2072, 2079, 2081, 2082, 2091 and Bangla lanka were the treatment variables. These seeds were collected from the Plant Genetic Resources Center, BARI, Gazipur. Seeds were subjected to accelerated ageing ( $40 \pm 2^\circ \text{C}$  and 100% RH) for 24, 48, 72 and 96 hrs, respectively. The seeds were tested in top of paper (TP) substrate at  $20-30^\circ \text{C}$  ( $25^\circ \text{C}$ ) temperature in seed germinator. After 12 days, only normal seedlings were taken as germination. Significant differences were observed in normal germination due to accelerated ageing of seeds after 24, 48, 72 and 96 hrs. Increasing period of

accelerated ageing reduced the germination percentage. Bangla Lanka possessed maximum germinability as compared to other lines. The highest shoot length (4.9 cm) was recorded in the line 2082 followed by line 2068 (4.5 cm) without any stress. Shoot length was gradually decreased with increasing of stress time while root length increased with the increasing period of accelerated ageing. The highest root length (5.15 cm) was recorded in line 2069 at 96 hrs ageing. The highest dry weight (39 mg) was recorded in Bangla lanka and the lowest (3 mg) in line 2082 under control condition. Increasing period of accelerated ageing also reduced the dry weight of seedling and vigour index. Line 2072 and Bangla lanka were more vigorous and the lines 2868, 2079 and 2070 were moderate with respect to vigour. It is revealed that line 2072 and Bangla Lanka were better for storage and had higher number of viable and vigorous seeds compared to the lines 2068, 2079, 2069 and 2070.

#### **STUDY THE SEED DORMANCY OF DIFFERENT LEGUMES**

**A. Nessa, O. F. Tarafdar and S. A. Begum**

Lentil, grasspea, chickpea and mungbean were collected at field maturity stage during 2001-2002 to determine the dormancy period of these legumes and develop a suitable technique to break dormancy. The mature, clean and healthy seeds were tested for germination and stored. It was observed that initial germination of lentil seed lot was 20% and khesari 45%. Among the methods, mechanical scarification increased the germination percentage to the satisfactory level. Hot water treatment (1 to 3 minutes) increased the germination percentage as well as normal seedling. Sulphuric acid treatment induced to increase germination percentage under the shorter

period of soaking (1-3 minutes). Excessive soaking in sulphuric acid deteriorated the seed germination. Results showed that mechanical scarification is comparatively safe and suitable. Hot water soaking for 3 minutes may be suggested for breaking the dormancy of these crops.

#### **STUDY OF IMPROVING GERMINATION OF *SESBANIA ROSTRATA* GREEN MANURE CROP**

**M.S. Rahman and M. R. Khan**

The study was carried out at the Laboratory of Seed Technology Division, BARI during 2002-2003 to identify the suitable method(s) for breaking the dormancy of *Sesbania rostrata* seed. Seeds were obtained by harvesting the crop when 90-95% pods were fully matured. The mature seeds were treated in the following ways to improve germination: i) Rubbing the seeds with gunny bag and make scratch on seed coat, ii) Rubbing the seeds on sand papers to make the hard seed coat thinner, iii) Boil water in a beaker and seeds were immersed in a boiling water, kept for a minutes and then remove water from seeds and dry under shade, iv) Seeds were imbibed for 24 hours in cold water and then dried, v) Seeds were placed in  $\text{KNO}_3$  solution (24 hours) and vi) Only water (control). Seeds rubbed by smooth sand paper attained the highest germination (76%). Seeds treated with  $\text{KNO}_3$  solution also indicated good performance in breaking dormancy of the seed. Imbibitions of seeds with water increased the rotten seed percentage. The germination in control treatment was the lowest (14%), where 86% seeds remained dormant. However, to improve the germination of *Sesbania rostrata* seed by mechanical scarification with sand paper rubbing could be a good option.

## EFFECT OF FUNGICIDAL SEED TREATMENT ON EMERGENCE, GERMINATION AND SEEDLING GROWTH OF GROUNDNUT

O. F. Talukdar, A. Nessa and M. R. Khan

The experiment was conducted at the research field of Seed Technology Division, BARI during 2002-2003 to determine effectiveness of the fungicides on seed viability of Groundnut. Groundnut varieties Dhaka-1, BARI Chinabadam-6, Zinghabadam and BARI Chinabadam-5 were sown on 7 November 2001. The seeds were collected from harvested crops and stored in different containers. The treatment combinations were: i) Polythene bag, ii) Polythene bag + Vitavax @ 2 g/kg seed, iii) Polythene bag + Topsin M, iv) Polythene bag + Bavistin @ 2g/kg seed, v) Plastic pot, vi) Plastic pot + Vitavax @ 2g/kg seed, vii) Plastic pot + Topsin M, viii) Plastic pot + Bavistin @ 2g/kg seed, ix) Tin container, x) Tin container + Vitavax @ 2g/kg seed, xi) Tin container + Topsin M and xii) Tin container + Bavistin @ 2g/kg seed. Germination percentage, moisture content and presence of any pathogen were examined before and end of storage (after 9 months). Results showed that out of 10 fungal species, *Aspergillus flavus*, *Aspergillus niger* and *Aspergillus oleraceous* were dominant in all the varieties. Germination of groundnut seeds at the end of storage were 92, 95, 88 and 80 percent in Dhaka-1, BARI Chinabadam-6, BARI Chinabadam-5 and Zingabadam, respectively. Initial germination ranged between 92 and 98%. Moisture content at the time of storage was 8%. Fungal prevalence was the highest in the control (no seed treatment) treatment. Among the containers, the cheapest material polybag resisted the prevalence of dominant fungi like *A. flavus*, *A. niger* and *A. oleraceous*. At the end of storage, all the varieties were found infested in the treatments where Bavistin and polythene bag were used.

## STUDIES OF SEED AND SEEDLING ATTRIBUTES OF BOTTLE GOURD GENOTYPES

**S. A. Begum, M. R. Khan and A. Nessa**

The experiment was carried out following CRD design with three replications at the Laboratory of Seed Technology Division during 2002-2003 to evaluate the seed and seedling characters in terms of germination and vigour of bottle gourd genotypes. Seed of thirty two genotypes or Acc. number (BG 1, BG 2, BG 3, BG 4, BG 5, BG 6, BG 7, BG 8, BG 9, BG 10, BG 11, BG 12, BG 13, BG 14, BG 15, BG 16, BG 17, BG 18, BG 19, BG 20, BG 21, BG 22, BG 23, BG 24, BG 26, BG 27, BG 27, BG 28, BG 29, BG 30, BG 31 and BG 32), were collected from HRC, BARI and one hundred seeds of each genotype were placed in moist sand at room temperature (28-30<sup>0</sup>C). Number of normal seedlings was recorded from six to twelve days of the seeding. Significant variation was observed on seed size and seed quality across the genotypes or Acc. number. The large sized seed (1.15 cm) was recorded from BG 9 and the small size (0.792 cm) from BG 14. BG 7 produced significantly higher 1000-seed weight (35.28 g) than other genotypes. Maximum germination (98.67%) was obtained from BG 4 and BG 21. The highest seedling dry weight (0.8483 g) and vigour index (80949) were recorded from BG 32. However, it was similar to BG 24 and BG 2. Seeds of BG 24, BG 2 and BG 32 were high in quality.

## EFFECT OF NITROGEN AND IRRIGATION ON SEED QUALITY OF ONION

**S. A. Begum, M. R. Khan, A. Nessa and O. F. Tarafdar**

The experiment was conducted at the research field of Seed Technology Division, BARI, Joydebpur, Gazipur during rabi season of 2002-2003 to study the effect of nitrogen and irrigation on the production of quality seeds of onion (Variety Taherpuri). Four levels of irrigation ( $I_1 = 0$ ,  $I_2 = 7$ ,  $I_3 = 14$ , and  $I_4 = 21$  days interval after umbel initiation) and six levels of nitrogen (0, 45, 90, 135, 180 and 200 kg N/ha) were used as treatment variables. Planting of bulb was done during the last week of November, 2002 with a spacing of 45 cm x 30 cm. Seed quality of onion increased linearly with the increase of N doses up to 180 kg/ha and thereafter decreased. The interaction effect between irrigation and nitrogen revealed that the highest percentage of germination (94%) and speed of germination (92%) were obtained from  $I_4N_{180}$  and  $I_2N_{200}$ . The highest root length (2.73 cm) was noticed from  $I_1N_0$  followed by  $I_1N_{45}$ ,  $I_1N_{135}$ ,  $I_2N_{200}$  and  $I_4N_{45}$  Treatments. Maximum dry weight of seedlings was noted in  $I_3N_{180}$ . Root-shoot ratio was found the highest (48.02) from  $I_4N_{45}$  and the minimum (20.40) in  $I_3N_{180}$ . The highest vigour index (213.03) was obtained from  $I_4N_{180}$  followed by  $I_3N_{180}$  and  $I_1N_{135}$  kg/ha. Application of 180 kg N/ha and irrigation at 21-day interval from umbel initiation is necessary to obtain high quality seed of onion.

## **EFFECT OF HARVESTING STAGE ON SEED QUALITY OF DIFFERENT GENOTYPES OF CHILLI**

**S. A. Begum, M. R. Khan, A. Nessa and O. F. Tarafdar**

The experiment was conducted at the research field of Seed Technology Division, BARI, Joydebpur, Gazipur during rabi season of 2002-2003 to find out the optimum stage of fruit maturity of different cultivars/lines of chilli for obtaining quality seeds. Seed of different lines of chilli viz. CA-2067, CA-2069, Khagrachari-1, Khagrachari-2, Baluchari-1, Baluchari-2, CA-2070, CA-2072, CA-2079, CA-2081, CA-2082, and Bangla lanka were the treatment variables. Those were collected from the Plant Genetic Resource Center, BARI, Gazipur, and the Chittagong region. Germination percentage, speed of germination, root length, shoot length, root dry weight, shoot dry weight, root-shoot ratio and vigour index were significantly influenced by different cultivars/lines and harvesting stages. The highest percentage of germination (94%) was obtained from line CA-2072 but, statistically similar with CA-2068, CA-2069 and Khagrachari-1. Germination percentage and speed, root length, shoot length, seedling dry weight, root-shoot ratio and vigour index were gradually increased from green fruit stage to red fruit stage and decreased in over ripening stage. Interaction between chilli cultivars/lines and different harvesting stages showed different reactions. Maximum cultivars gave the highest percentage of germination and good quality seed when fruits were harvested at red stage followed by green red.

## **EFFECTS OF SEED SIZE ON THE FIELD PERFORMANCE OF HYBRID MAIZE**

**M.S. Rahman and M. R. Khan**

The experiment was conducted during rabi season of 2003-2004 at Joydebpur, Gazipur to compare the field performance of BARI hybrid maize with the imported ones having different seed sizes. Two varieties (BARI hybrid maize-1 and Pacific 984) and three grades of seeds (Bulkseed, Large and Small) were used as treatment variables. The seeds were sown on 28 December, 2003 using 75cm x 25 cm spacing. The recommended 250 kg N-53 kg p, 100 kg K, 40 kg S and 5 kg Zn/ha fertilizer were used. Results showed that Pacific 984 was found superior to BARI hybrid maize-1 in terms of dry matter production. Seed size had no impact on dry matter production for both the varieties. Pacific 984 (7.2 t/ha) showed its superiority over BARI variety (6.6 t/ha) in respect of yield. Large sized seeds for both the varieties were found good for higher seed yield.

## **STUDY OF SEED DORMANCY AND VIABILITY OF RADISH, CAULIFLOWER, TOMATO AND MUSTARD**

**W. Sultana, M.R. Khan and A. Nessa**

The experiment was conducted at the laboratory of Seed Technology Division, BARI, Joydebpur, Gazipur during April to June 2003-2004 to investigate the viability of farmers' stored seeds of radish, cauliflower, tomato and mustard. Seeds of radish, tomato, cauliflower and mustard were collected from Rangpur, Dinajpur and Jessore. Initial germination and moisture content

were determined for each seed sample and stored under normal conditions. Germination percentages were recorded for radish (70-95%), mustard (71-81%) and cauliflower (42-82%) at the beginning. To break dormancy of seeds of radish, cauliflower and tomatoes, 1%  $\text{KNO}_3$  solution was used instead of water during germination test. At the end of storage, the germination of radish seeds collected from Rangpur and Jessore were 77% and 75%, respectively. Cauliflower seeds of Rangpur had more than 82% germination whereas seeds of Dinajpur and Jessore had low germination. Higher germination (72-89%) was observed in case of tomato seeds collected from Rangpur and Jessore.

#### **EFFECT OF SPACING AND NITROGEN ON SEED QUALITY OF CHILLI**

**S. A. Begum, M. R. Khan and A. Nessa**

Hot pepper (*Capsicum annuum L.*), commonly known as chilli, is an important spice and vegetable crop. Seed quality is measured by its vigor and viability. It plays a major role in seedling establishment and ultimately higher crop yield. Hence, the experiment was conducted during rabi season of 2003-2004 at the research field of Seed Technology Division, BARI, Gazipur to study the effect of four levels of nitrogen (0, 45, 90 and 135 kg/ha) and three spacings (40 cm x 20 cm, 40 cm x 30 cm and 40 cm x 40 cm) on quality chilli seed production. Transplanting of seedlings was done during the last week of November in 2003. Significant differences in quality seed production of chilli was observed among different spacings. Bold seeds of the highest grade were obtained from 40 cm x 30 cm spacing. Nitrogen dose ranging from 90 to 135 kg N/ha was found most suitable for quality seed production in chilli.

Maximum vigor index was observed from the seeds obtained for 90 kg N/ha treatment. The interaction of nitrogen and spacing had significant effect on quality chilli seed production. Application of 100 kg N/ha along with 40 cm x 30 cm spacing was found optimum for production of quality chilli seed (5.33 g/1000-seed weight, 92% germination and 327 vigour index).

**EFFECT OF SEED ORIENTATION AND SEED PLACEMENT IN SOIL ON  
SEEDLING EMERGENCE IN SOME CUCURBITACEOUS VEGETABLE**

**S. A. Begum, M. R. Khan and M. S. Rahman**

The experiment was conducted at the laboratory of Seed Technology Division, BARI, Gazipur during 2003-2004 to study the influence of orientation and placement of seed in the soil for seedling emergence. Seeds of the different cucurbits viz. Bottle gourd (*Lagenaria siceraria*), Sweet gourd (*Cucurbita moschata*), Sponge gourd (*Luffa cylindrica*), Watermelon (*Citrullus vulgaris*), Ash gourd (*Benincasa hispida*), Snake gourd (*Trichosanthes anguina*), Bitter gourd (*Momondica charantia*), Ridge gourd (*Luffa acutangula*) and Cucumber (*Cucumis sativus*) were collected from the Horticulture Research Center, BARI. Hundred seeds of each crop were placed in moist sand at 25°C and 85-90% relative humidity at 2 and 4 cm depth and at vertical, horizontal and inverted position. Different cucurbitaceous vegetables showed different reactions due to different treatments of orientation and placement of seed in soil for seedling emergence. Placement of seeds at 4 cm depth and at vertical position gave higher germination in all the vegetables except ridge gourd. Root and shoot length of the vegetables differed

significantly due to different treatments. Placement of seed at 4 cm depth and at vertical position also gave the highest vigour index. Thus, sowing seeds vertically at 4 cm depth exhibited the highest emergence. It will help to produce quality seeds in the long run.

### **EFFECT OF DATE OF SOWING AND FRUIT POSITION ON QUALITY OF OKRA SEED**

**S.A. Begum, M.R. Khan and M.S. Rahman**

BARI Dheros-1, a variety of Okra is early, high yielding and resistant to Yellow Vein Mosaic Virus (YMV), the most serious disease of the crop during the rainy season. Moreover, availability of quality seed is one of the limiting factors for Okra production. Sowing time has a great impact on production and quality of Okra seed. Hence, the experiment was conducted at the research field of Seed Technology Division, BARI, Joydebpur, Gazipur during rabi season of 2004-2005 to find out the appropriate sowing time and position of fruit on quality seed production. The sowing dates were February to June with an interval of 15 days. Yield and quality of okra seeds were significantly influenced by different sowing dates. The highest seed yield (1600 kg/ha) was recorded from mid -February sowing and middle positioned fruits. Thus, the quality seed was also produced from the similar sowing time and fruit position (86% germination and 28 seed vigour index).

## **EFFECT OF SEED SIZE ON THE GROWTH AND THE SEED QUALITY OF INBRED LINES OF BARI RELEASED HYBRID MAIZE**

**S.A. Begum, M.R. Khan and A. Nessa**

The experiment was conducted at Joydebpur, Gazipur during rabi season of 2005-2006 to determine the influence of seed size on the growth and the seed quality of different inbred lines of BARI released hybrid maize. Eight genotypes viz. BIL 29, BARI Hybrid Maize-2, BIL 20, BIL 22, BARI Hybrid Maize-3, BIL 28, BARI Hybrid Maize-5, and BIL 31 as well as three graded seeds viz. Grade I (small), Grade II (medium) and Grade III (large) were used as treatments. Plant height varied significantly among the hybrids and inbred lines at different days after sowing (DAS). Significant difference was also found for plant height at different DAS due to variation of seed size. The tallest plant was obtained from large sized seed and the shortest from medium sized seed. Dry matter accumulation varied significantly among the genotypes at different DAS. The highest dry matter was obtained from large sized seed and the lowest from medium sized seed. Seed quality parameter varied significantly among the genotypes except root length and percentage of germination. Maximum vigor index (62996) was recorded in BIL 28 and minimum in BIL 29 (3956). Seed quality parameter was not significantly influenced by seed grading both in hybrid maize and inbred lines.

## **PLANTING TIME EFFECTS ON ONION BULB FOR QUALITY SEED PRODUCTION**

**M.B. Rahman, M.R. Khan and M.S. Rahman**

The experiment was conducted at Regional Wheat Research Centre, Shyampur, Rajshahi during the period from October 2005 to April 2006 to determine the optimum time of planting of onion bulb for obtaining quality seed. Seed bulb of BARI Piaz 1 ( $10 \pm 1$  g in weight) was sown on 21 November, 4 December and 22 December 2005 at a spacing of 25 cm x 20 cm. The land was fertilized with 5 ton cowdung, 120 kg N, 39 kg P and 75 kg K and 1 kg B/ha. Urea and MoP were applied in three equal splits at 25, 40 and 60 days after sowing (DAS). The highest number of flower stalks/plant (2.53) was obtained from 21 November planting and the lowest from 22 December planting (2.18). Maximum number of umbellate/unbell (186.05), and seeds/umbellate and highest seed yield/ha were also obtained from 21 November planting. Seeds of 21 November planting resulted in higher seed quality compared to December planting. It is revealed that 21 November planting produced the highest amount of quality seed. This might be due to prevalence of the longest cool period which helped in higher seed setting and seed formation.

## **STUDY ON SEED YIELD AND QUALITY OF GROUNDNUT AS INFLUENCED BY VARIETY AND POPULATION DENSITY**

**M.S. Rahman, M.R. Khan and M.A.Z. Chowdhury**

The experiment was conducted at Joydebpur and Jessore during rabi season of 2005-2006 to find out optimum plant population per unit area for

higher yield and quality seeds of groundnut varieties. Two varieties (BARI Chinabadam-7 and Dhaka-1) and six levels of spacing (30 cm x 15 cm, 35 cm x 15 cm, 40 cm x 15 cm, 30 cm x 10 cm, 35 cm x 10 and 40 cm x 10 cm) were used as treatment variables. Seeds were sown on 5 December at Joydebpur and 13 December 2005 at Jessore. Fertilizer doses @25-160-85-30 kg of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O-S/ha respectively were applied in the field. Results revealed that wider spacing (40 cm x 10 cm) in groundnut was found better for yield irrespective of locations. Variety Dhaka-1 showed its superiority in pod bearing capacity and pod weight to BARI Chinabadam-7. Two varieties produced pods having higher weight when spacing was 40 cm x 10 cm in both locations. Generally, the increased plant density increased the pod yield. Seed quality was not influenced either by variety or spacing as well as interactions.

#### **SURVEY ON THE STATUS OF TRADERS SEED OF SUMMER VEGETABLES**

**M.R. Khan, M. S. Rahman, M.B. Rahman, S. Ahmed and M.M.-E-Rahman**

A survey was conducted during 2005-2006 with a formal questionnaire to assess the quality of summer vegetable seeds (Ash gourd, Ridge gourd, Steam amaranth, Bitter gourd, Cucumber, Yard long bean, Okra, Sponge gourd, Snake gourd, Indian spinach and Gimakalmi) of wholesalers, dealers and retailers/vendors. The questionnaire was developed to get some basic information during collection of sample seed. One hundred eighty five sample seeds of summer vegetables were collected from wholesalers, dealers and retailers/vendors covering Sddiq Bazar, Dhaka for wholesalers and seed dealers, retailers/vendors from different parts of the country. Data were

analyzed and seed samples were tested in the laboratory of Seed Technology Division, BARI. The average moisture content of the summer vegetable seeds collected from traders was within the acceptable ranges from 5.62 to 9.48%. A seed having semi-permeable to hygroscopic seed coat varies in moisture content because of their ability to capture or absorb atmospheric moisture. The purity of the seeds ranged between 88 and 95%. Germination percentages of the seed samples of the collected vegetables varied between 65.7 and 81.5%. Seed vigour varied from 76 to 104 due to variation of seedling sizes of the different vegetables.

### **SURVEY ON THE STATUS OF TRADERS SEED OF WINTER VEGETABLES**

**M.R. Khan, M. S. Rahman, M.B. Rahman, S. Ahmed and M.M.-E-Rahman**

A survey was conducted during 2005-2006 with a formal questionnaire to assess the quality of seeds of winter vegetables (Cabbage, Cauliflower, Brinjal, Tomato Radish, Countrybean, Knolkhol, Spinach, Pumpkin, Bottle gourd, Carrot, Turnip, Broccoli and Capsicum) collected from wholesalers, dealers, retailers/vendors across the country. Simple questionnaire was developed to get some basic information during collection of sample seeds. One hundred ninety sample seeds of winter vegetables were collected from wholesaler, dealers and retailers/vendors covering Siddiq Bazar, Dhaka and different parts of the country. The information collected by the questionnaire was analyzed and seed samples were tested in the laboratory of Seed Technology Division, BARI. Sources of seed, their storage and other relevant

information were also recorded. The high value winter vegetable seeds of cauliflower, tomato, knol-khol, carrot, broccoli and capsicum are mainly imported and available in bulk amounts with the wholesalers. Other winter vegetable seeds are locally available. Most of the winter vegetable seeds are hygroscopic and a little amount of moisture absorption deteriorates their germination ability. The seeds samples were stored in air tight polythene bag irrespective of traders group from large to small. Results from the laboratory test revealed that irrespective of traders group, the average moisture content of the collected seeds samples ranged from 5.79 to 9.27%. Purity percentage also varied from 84 to 96%. The average germination of different winter vegetable seeds of different trader group, ranged between 57 and 88%. Bottle gourd seeds showed less germination irrespective of trader groups. The winter vegetable seeds had higher seedling dry weight and vigour index.

#### **EFFECT OF STORAGE CONTAINERS AND FUNGICIDAL TREATMENT ON THE VIABILITY OF SOYBEAN SEED**

**A. Nessa, M.R. Khan and S.A. Begum**

The study was conducted at the laboratory of Seed Technology Division, BARI during 2005-2006 to investigate the prevalence of microbes associated with seeds, the suitable containers for safe storage and select the suitable fungicide to reduce infestation of seeds. Seeds of Bangladesh soybean-4 was collected from ORC, BARI. The seeds were divided into six portions. One portion was used as control i.e. without any chemical treatment and the other five portions were treated with Dithane, Knowin, Rovral, Vitavax and Metaril. Each of the chemically treated portions of seeds was

divided into three parts and stored in (i) tin container, (ii) earthen pot and (iii) polythene bag. Before storage, seeds were analyzed for germination, moisture content and fungal association. The seeds stored upto the next planting season in the cool room. Seed borne fungal pathogens were identified in blotter method as *Aspergillus flavus*, *Aspergillus niger*, *Aspergillus clavatoronica*, *Aspergillus flavileps*, *Fusarium oxysporum*, *Fusarium solani*, *Rhizopus* sp. *Chactomium globosum*, *Chactomium elotum*, *Panicillium* sp. and *Curvularia* spp. Among the pathogens, *Aspergillus niger* (39%) and *Aspergillus flavus* (25%) were highly prevalent in the seeds. The initial moisture content was 9.93%. Stored seeds under ambient condition showed less germination. Seed stored in cool room (15-17<sup>0</sup>C) performed well in respect of germination. At the end of storage, the germination percentage of seeds in different treatments did not show any significant variation. In all the cases, germination ranged from 72 to 77% while control treatment had 84%. Moisture content was also 10% irrespective of containers and fungicidal treatment.

#### **SEASONAL EFFECT ON GROWTH, YIELD AND SEED QUALITY OF SOYBEAN**

**R.R. Saha and M.A. Hossain**

The experiment was conducted at Joydebpur in two seasons (rabi 2005-2006 and kharif II 2006) to evaluate the seasonal variation on growth, yield and seed quality of three soybean varieties (Sohag, Bangladesh soybean-4 and BARI soybean-5). The seeds were sown on 9 December in rabi, 2005-2006 and 26 July in kharif-II 2006, respectively. Results showed that seasonal variation did not alter the number of pods/plant and seeds/pod. The tallest plant and the highest seed yield/ha were obtained from the rabi season. Plant height, number of pods/plant, 100-seed weight and seed yield/ha of soybean showed significant variations across the varieties. Bangladesh Soybean-4

produced significantly the tallest plant and higher pods/plant compared to other two varieties. BARI soybean-5 had the largest seed weight (12.0g/100 seed). The highest seed yield (2112 kg/ha) was recorded in BARI Soybean-5 and it was statistically similar with Sohag (2086 kg/ha). The lowest seed yield/ha (1665 kg/ha) was noted in Bangladesh soybean-4. Interaction between season and variety had exhibited sound response. Significantly, the highest seed yield (2324 kg/ha) was recorded with BARI soybean-5 sown on kharif-II followed distantly by Sohag sown on kharif-II season (2253 kg/ha). Kharif-II season had positive effect on germination percentage of seed, root and shoot length. The higher vigour index was noted in BARI soybean-5 (9518) followed by Sohag (9901). It is revealed that BARI soybean-5 is the best in respect of yield and seed quality irrespective of growing season. Kharif-II season was found better for quality seed. Further, it produced the maximum yield though it is risky period due to sudden heavy rain.

#### **SEED QUALITY AND YIELD OF CHILLI AS AFFECTED BY DIFFERENT GROWTH REGULATORS**

**W. Sultana, M.R. Khan and M.B. Rahman**

A pot experiment was conducted at Seed Technology Division, BARI Kharif, 2006 to study the yield and seed quality of chilli following application of growth regulators. The treatments were T<sub>1</sub> = distilled water (control), T<sub>2</sub> = 5 ppm NAA, T<sub>3</sub> = 10 ppm NAA, T<sub>4</sub> = 100 ppm Ethephon, T<sub>5</sub> = 250 ppm Ethephon, T<sub>6</sub> = 50 ppm Knap, T<sub>7</sub> = 100 ppm Knap and T<sub>8</sub> = 250 ppm Knap. Spraying chilli seedlings with 250 ppm Knap gave the significantly the

highest yield (238.89g/plant) followed by 100 ppm Knap (210.0 g/plant). The lowest yield (103.1 g/plant) was recorded in control plants. The highest number of fruits/plant was obtained in 250 ppm Knap (126.3) followed by 100 ppm Knap (123.4). Seeds harvested from all the treated plants showed higher seed germination than control. Higher germination percentages was obtained in seeds of 10 ppm NAA followed by 250 ppm Ethephon. Seedling vigour was significantly higher in 10 ppm NAA and 250 ppm Ethephon treated plants. The lowest germination percentage and seedling vigour was recorded in control plants.

#### **EFFECT OF MICRONUTRIENT SEED TREATMENT ON THE SEED YIELD OF GROUNDNUT**

**M.S. Rahman**

The experiment was conducted at Joydebpur during 2006-2007 to study the effect of seed treatment with B, Zn and Mo on groundnut (var. BARI Chinabadam-7). The micronutrients like B, Zn and Mo were supplied through boric acid, zinc oxide and ammonium molybdate, respectively. Micronutrients were mixed with molasses and the seeds were treated with the molasses mixed micronutrient. The treated seeds were dried in the air for half an hour and then sown in 30 cm x 15 cm spacing. The maximum number of effective nodules/plant was recorded by Zn @ 4g/kg seeds + Mo @ 2g /kg seed and it was statistically similar with Zn @ 2g/kg seed + Mo @ 4 g/kg seeds, Zn @ 4g/kg + Mo @ 4g/kg and B @ 1g/kg seed + Zn 2g/kg seed + Mo @ 4g/kg seed in combinations. Number of pods/plant was significantly higher in the treatment receiving B @ 1g/kg seed + Zn @ 2g/kg seed and it did not vary

with B @ 1g/kg seed + Zn @ 2g/kg seed + Mo @ 2g/kg seed, B @ 1g/kg seed + Zn @ 2g/kg seed+ Mo @ 4g/kg seed and B @ 1 g/kg seed+ Zn @ 4g/kg seed + Mo 2g/kg seed treatments. Similar trend was also noticed in case of 100-seed weight. The maximum pod yield (2.8 t/ha) was obtained with the seed treatment of B @ 1g/kg seed + Zn @ 2g/kg seed+ Mo @ 4g/kg seed in combinations along with 25 kg N, 60 kg P<sub>2</sub>O<sub>5</sub> and 85 kg K<sub>2</sub>O/ha.

#### **EFFECT OF PLANT GROWTH REGULATORS ON SEED YIELD AND QUALITY OF FRENCH BEAN**

**M.B. Rahman and M.S. Rahman**

A field experiment was conducted during rabi season of 2006-2007 at Joydebpur to find out response of growth regulators on yield, yield attributes and seed germination of french bean (var. BARI Bushbean-1). Seven treatments viz. Gibberellic acid (GA<sub>3</sub>) @ 30, 60 and 90 ppm, Naphthelic acetic acid (NAA) @ 25, 50, 75 ppm and control. The land was fertilized with 5 ton/cowdung + N<sub>50</sub>P<sub>40</sub>K<sub>80</sub>S<sub>10</sub>B<sub>1</sub> kg/ha. Foliar sprays of GA<sub>3</sub> and NAA were done during vegetative stage. Number of pods/plant and seeds/pod remained unaffected by any of the treatments imposed. The highest 1000-seed weight was recorded from the application of NAA @ 50 ppm followed by NAA @ 25 and 75 ppm. The seed yield/ha was the highest in the treatment of NAA @ 75 ppm and statistically similar to NAA @ 25, 50 ppm and GA<sub>3</sub> @ 60, 90 ppm. The lowest yield was obtained from the control treatment. There was no significant difference among the different treatments in case of germination percentage.

**EFFECT OF SEED SIZE ON THE GROWTH, DEVELOPMENT AND SEED QUALITY OF INBRED LINES OF BARI RELEASED HYBRID MAIZE**

**S.A. Begum, A. Nessa , M.S. Uddin and M.A. Hossain**

The experiment was conducted at Joydebpur during rabi season of 2006-2007 to determine effect of seed size on growth and seed quality of inbred lines of BARI released hybride maize varieties. Eight genotypes/ lines /hybrids (BIL 29, BARI Hybrid Maize-2, BIL 20, BILL 22, BARI Hybrid Maize-3, BIL 28, BARI Hybrid Maize-5 and BIL 31) and three graded seeds (small, medium and large) were the treatment variables. Fertilizers were applied @ 250 kg N, 53 kg P, 100 kg K, 40 kg S and 5 kg Zn/ha. The treatment variable varied significantly among themselves with respect to plant height, dry matter and vigour index. Plant height from 142.65 to 225.50 cm across the genotypes. The tallest plant was obtained from BHM-3 and the lowest from BIL-22 at 140 days. The variation in dry matter/plant across the genotypes ranged between 49.19 and 122.06 g and the highest was recorded in BHM-3. Vigour index ranged between 36567 and 62996. The highest vigour index was obtained from BIL-28. Variation of seed grade did not show any significant effect in respect of plant height, dry matter and seed quality parameters. The interaction effects between genotypes and seed grade on growth and seed quality parameters were also not significant.

## **EFFECT OF BORON ON HYBRID MAIZE SEED PRODUCTION**

**S. A. Begum, M.A. Hossain, M.S. Uddin and Firoza Begum**

The experiment was conducted at Joydebpur during rabi season of 2006-2007 to determine the optimum dose of B for high yield and quality grain of hybrid maize. Treatments included 5 levels of boron (0, 1, 2, 3 and 4 kg B/ha). Parental lines of BARI hybrid maize 5 (QPM) (BIL 20 x BIL 22) were sown in this experiment. Seeds of parental lines were sown in isolation (time/space) maintaining a ratio of four female rows alternate with two male rows. Male rows were sown in two different dates for synchronization. Fertilizer were applied @ 250 kg N, 53 kg P, 100 kg K, 40 kg S and 5 kg Zn/ha. The yield/plant and number of grains/row of hybrid maize were significantly influenced due to different doses of boron fertilizer application. Application of B fertilizer did not show any significant variation in respect of 100-seed weight and seed quality parameters. The highest number of grains/row was obtained with 2 kg B/ha and the lowest from control (without B). The yield/plant varied from 151.10 to 505.00 g and the highest grain yield/plant was obtained from 2 kg B/ha. Yield advantage for B application @ 2 kg/ha was 36% higher over the control. Further, increase in dose of B (beyond 2 kg/ha) fertilizer significantly reduced the grain yield/plant

## RESPONSE OF GENOTYPES/ADVANCE LINES IN RELATION TO SEED YIELD AND QUALITY IN LENTIL UNDER DIFFERENT AEZs

A. Nessa, M. Biswas and A. Hamid

Field experiments were conducted at Joydebpur, Jamalpur and Ishurdi during the winter (rabi) season of 2006-2007 to find out the suitable lines which are capable to adapt themselves at different locations of Bangladesh in respect of yield and seed quality. Fifty advanced lines were collected from ICARDA, Syria. After experimentation, 25 lines of lentil were selected on the basis of yield. At Ishurdi, the line 9926 produced the highest yield (2311 kg/ha) and statistically similar with the lines 7979, 8618 and BM-2. The line 7979 obtained second highest yield (2130) followed by lines 8618 (2109 kg/ha), 9927 (2040 kg/ha) and 9877 (2033) kg/ha. At Jamalpur, seed yield ranged from 437 to 1047 kg/ha. Further, the lines 7723 (1047 kg/ha) and 91517 (982 kg/ha) produced the highest yield. Seed yield/ha also varied significantly among the lines at Joydebpur. The highest seed yield (1737 kg/ha) was recorded in line 8618 and closely followed by 91517 (1572 kg/ha). Among the lines, 9931, 4404, 8618, 9877, 4605, 9951 and 9996 were the earliest in maturity (120 days). At Joydebpur, the lines 7723, 9994 and 9995 showed maximum seed germination. Vigour index varied from 100 to 994 and the highest was recorded from the lines 9996, 9935, 4404, 9985 and 4605. On the other hand, the highest germination percentage was recorded from the line 9995 (65%) and 9942 (60%). Maximum vigour index was observed from the lines 9994 (0.456) and 9926 (0.416) at Jamalpur. At Ishurdi, maximum vigour index (0.411-0.675) was registered by the lines 9995, BM-2, 6024, 4605, 4404 and 7723. Averaged over locations, line 9995 was better in respect of seed germination and vigour index after harvest.

## STUDY ON THE STORABILITY OF LENTIL SEEDS COLLECTED FROM ADVANCED LINES

A. Nessa

The experiment was conducted at the Seed Technology Laboratory under ambient condition during 2006-2007 to identify the lentil lines which are suitable for farm level seed storage as well as suitable storage container. Initial moisture content was around 6-9%. Germination percentage of the lentil seed at initial level was very low (30-45%) in most of the lines. This might be due to the temporary dormancy of the seed. It is observed that the germination percentage increased with the advancement of time. This type of dormancy disappears with the time without any treatment in storage. Lines 4605, 9935, 6024, 2580 and 9951 showed lower germination percentage. Initial moisture contents (7.8-9.0%) of the seeds of these lines were higher. Vigour index of the stored seeds were affected by the lines as well as the container. In the case of polythene bag, highest vigour indices were obtained from the lines 7723 (0.720) and 9926 (0.705). When the seeds were stored in plastic pot, higher vigour indices were noticed in case of the lines 9989 (0.633), 9927 (0.630) and 9945 (0.612). The highest vigour indices were obtained from seeds of the lines 7723 (0.691), 7981 (0.691) and 4405 (0.642) when stored in tin container.

## INFLUENCE OF SEED AGEING ON THE YIELD OF SOYBEAN

R.R. Saha and M.A. Hossain

An experiment was conducted at Joydebpur during rabi season of 2006-2007 to evaluate the effect of seed ageing on yield of three soybean varieties. Four levels of seed ageing viz. A<sub>1</sub> (20 months) A<sub>2</sub> (13 months), A<sub>3</sub> (8 months) and A<sub>4</sub> (2 months) and three varieties viz. V<sub>1</sub> (Sohag), V<sub>2</sub> (Bangladesh soybean 4) and V<sub>3</sub> (BARI soybean 5) were used as treatment variables. The experimental plots were fertilized @ 30-35-50-20 kg NPKS/ha. Seed ageing significantly influenced the number of plants/m<sup>2</sup>, pods/plant, root weight/plant and seed yield/ha. The impact of seed ageing on number of seeds/pod and 100-seed weight was not significant. Number of pods/plant and seed weight/plant increased with increasing ageing period. Plant population/m<sup>2</sup> decreased as seed ageing increased which resulted in low seed yield. Plants/m<sup>2</sup> was positively correlated with field emergence percentage (r=0.80). The highest plant population per m<sup>2</sup> and seed yield were recorded from A<sub>4</sub> (2 months old seed) followed by A<sub>3</sub> (8 months old seed) and the lowest from A<sub>1</sub> treatment (20 months old seed). Variation of varieties had significant influence on the yield. The highest seed yield (1615 kg/ha) was recorded in BARI soybean-5 closely followed by Bangladesh soybean-4. Interaction of variety and seed ageing levels significantly influenced the seed yields. The highest seed yield (1615 kg/ha) was obtained from BARI soybean-5 which grown from A<sub>4</sub> (2 months aged seed). It was statistically similar with the same variety grown from A<sub>3</sub> (8 months aged seed). It is indicated that seeds of Bangladesh soybean-4 could be stored up to 12 months and BARI soybean-5 up to 8 months under ambient conditions after properly dried the seed.

## EFFECTIVENESS OF SALICYLIC ACID (SA) IN CONTROLLING LATE BLIGHT DISEASE FOR QUALITY SEED PRODUCTION IN TOMATO

**N.N. Khanam**

The experiment was carried out at the research field of Seed Technology Division, BARI, Joydebpur during rabi 2006-2007 to determine effective dose of salicylic acid (SA) to control late blight disease of tomato and evaluate plant growth and quality seed production. Forty day old seedlings of tomato (var. Ratan) were transplanted in December 2006. There were nine treatments of salicylic acid at different concentrations ranging from 0.5mM to 15 mM sprayed at 20 days interval. The effect of different doses of SA varied significantly to control late blight disease of tomato. The severity disease at 45 days of tomato plants was found among the different dose of SA. The lowest disease severity was recorded from 5mM (0.25) and 8mM (0.45) of SA. However, the disease severity was high in the rest of the treatments including control (only water sprayed). The disease severity was static upto a 60 days of crop age in case of 15mM (5.16), 10 mM (5.66) and 0.5mM (5.87) of SA showing no difference with the control (6.13). The distinct suppressive effect was observed in 5mM (0.87) and 8 mM (1.50) of SA treatments. Again at 75 days of crop age, the highest severity was recorded from the control, 15mM and 10m M of SA. It is revealed that, SA 5mM is the best treatment in respect of yield (5.80 kg plot<sup>-1</sup>) and quality of tomato seeds.

## **EFFECT OF FOLIAR APPLICATION OF PLANT GROWTH REGULATORS AND NUTRIENTS ON SEED YIELD AND QUALITY ATTRIBUTES OF MUNGBEAN**

**M.S.Rahman**

A field study was conducted at the research field of Seed Technology Division, BARI, Joydebpur during Kharif-1 of 2007 season to evaluate the effect of plant growth regulators and nutrients on yield and seed quality of mungbean. Two varieties (Barimung-5 and Barimung-6) and four plant growth regulators (NAA @ 25 ppm, GA<sub>3</sub> @ 50 ppm, Ethrel @ 50 ppm and 2% urea solution) were used as experimental materials. Basal doses of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were applied @ 25, 50, 20 kg/ha, respectively before sowing. Plant growth regulators and nutrient (urea) were sprayed over plants at 30 days after sowing (Just before flowering). The treatment of NAA (25 ppm), GA<sub>3</sub> (50 ppm) and Ethrel (50 ppm) increased the number of flowers/plant by 18, 20, 14% in BARImung-5 and 16, 10, 22% in BARImung-6 over the control. GA<sub>3</sub> produced the highest number of flowers/plant followed by NAA for both the varieties. Foliar application of NAA (25 ppm) had a positive interaction with the varieties exhibiting higher pod setting. NAA (25 ppm) produced 31% more pods compared to control. Urea solution failed to produce significant difference with the control in case of pods/plant. The foliar applications of NAA and GA<sub>3</sub>, had good effect on increased 1000-seed weight. Seed yield/ha and seed vigour remained unaltered due to plant growth regulators and varieties.

## **GERMINATION RESPONSE OF BRINJAL AT HIGH TEMPERATURE REGIME**

**A. Nessa, M.A. Hossain, S.R. Saha, M.S. Alam, M.A. Salam,  
S. Ahmed and M.A. Rashid**

The study was carried out in the Laboratory of Seed Technology Division; BARI during the period from September to November 2007 to find out suitable brinjal genotypes that germinates under high temperature. The experiment was set up in a Completely Randomized Design (CRD) in a factorial arrangement with three replications. Seventeen brinjal genotypes viz. Uttara, BARI Begun-6, BARI Begun-7, BARI Begun-8, Kazla, Nayantara, BL-083, BL-114, BL-113, EGN-195, BL-099, BL-081, Islampuri, BL-102, BL- 072, BL- 092, BL- 095 and four levels of temperatures viz. room temperature (28-30<sup>0</sup>C); 33<sup>0</sup> C, 36<sup>0</sup> C and 39<sup>0</sup> C were used as experimental materials. It was observed that at 39<sup>0</sup> C temperatures the line BL-081 showed the highest germination percentage (61.57%) followed by BARI Begun-8 (60.42%), EGN-195 (56.70 %), BL-102 (48.00 %), and BL-092 (42.67 %) which indicates more heat tolerance than the others. Seed vigor gave the similar trend in the same varieties/lines.

## **EFFECT OF HARVESTING STAGE AND AFTER RIPENING OF FRUITS ON THE SEED QUALITY OF TOMATO**

**M.N. Islam, M.B. Rahman, M.A. Hossain, S. Ahmed and M.A. Rashid**

An experiment was conducted at the research field of HRC, BARI, Joydebpur, Gazipur during rabi season of 2007-2008 to find out the effect of harvesting stage and after ripening of fruits on the seed quality of tomato (var. Lalima). The treatment comprising four stages of harvest viz.i) Mature green

(showing a light colour), ii) Breaker (1/4 of the fruit showing pink), iii) Half ripe (1/4 of the fruit showing pink) and iv) Full ripe (Fully coloured and soft) and three levels of after ripening storage viz. 2, 4 and 6 days under ambient condition. The land was supplied with 5 t/ha of well-decomposed cowdung. Fertilizer @ 230 kg N, 79 kg P, 100 kg K and 30 kg S/ha were applied in the field. The highest yield of tomato (85 t/ha) was obtained from ripe stage and it was significantly different from all other treatments. Fruit harvested at half ripe stage recorded the highest germination percentage (79%), seedling dry weight (184 mg) and vigour index (14.43) compared to fruit harvested at green, breaker and full ripe stages. After ripening storage also showed significant influence on seed quality parameters. Among the ripening storage, 4 days storage recorded the highest seed quality parameters.

#### **EFFECT OF LIME AND BORON ON QUALITY HYBRID MAIZE SEED PRODUCTION**

**S.A. Begum, M.S. Uddin, H. Ullah, K.M. Hossain and M.A. Hossain**

Field trial on hybrid maize (cv. BARI hybrid bhutta-5) seed production was conducted in Non-Calcareous Floodplain Soils under Tista Meander Floodplain (AEZ 3) of Agricultural Research Station, Burirhat, Rangpur during rabi season of 2007-2008 to find out the response of lime (Dolomite) and boron on hybrid maize seed yield with better quality. Treatments comprising four levels of boron (0, 1, 2 and 3 kg ha<sup>-1</sup>) and 3 levels of lime (0, 1.5 and 3 t ha<sup>-1</sup>) along with a blanket dose of N<sub>120</sub>P<sub>35</sub>K<sub>65</sub>S<sub>20</sub>Zn<sub>3</sub> kg ha<sup>-1</sup> and cowdung 5 t ha<sup>-1</sup> were used. The treatments were arranged in a randomized

complete block design with 3 replications. The combined effect of boron and lime was found superior to their individual applications. The interaction effect between boron and lime was significant for hybrid maize seed yield. The highest yield (2808 kg ha<sup>-1</sup>) was recorded from boron @ 2.12 kg ha<sup>-1</sup> coupled with lime @ 1.5 t ha<sup>-1</sup> application. From regression equation, optimum and economic dose for B in respect of without liming, was calculated to be 2.40 and 2.39 kg B ha<sup>-1</sup>, 1.5 ton ha<sup>-1</sup> liming it was 2.13 and 2.12 kg B ha<sup>-1</sup> and 3 ton ha<sup>-1</sup> liming it was 2.0 and 1.99 kg B ha<sup>-1</sup> along with N<sub>120</sub>P<sub>35</sub>K<sub>65</sub>S<sub>20</sub>Zn<sub>3</sub> kg ha<sup>-1</sup> may be recommended for maximizing the yield and better quality of hybrid maize seed in the study area.

#### **EFFECT OF BORON AND MOLYBDENUM ON THE YIELD AND SEED QUALITY OF GARDEN PEA**

**M.S. Rahman, N.C. Shil and M.H. Ullah**

The experiment was conducted at the Agricultural Research Station, Burirhat, Rangpur during 2007-2008 to evaluate the influence of micronutrient (Mo and B) on seed yield and seed quality of garden pea. Five micronutrient rates (0.5 kg Mo, 1 kg Mo, 0.5 kg B, 1 kg/B and control i.e. without Mo and B) and two varieties of Motorshuti (BARI Motorshuti-3 and IPSA Motorshuti-3) were used as treatment variables. IPSA Motorshuti-3 produced higher number of pods plant<sup>-1</sup> than that of BARI Motorshuti-3. Variation in number of seeds pod<sup>-1</sup> and 1000-seed weight between the varieties were not significant. IPSA Motorshuti-3 produced the highest yield (3.01 t ha<sup>-1</sup>) compared to BARI Motorshuti-3 (2.07 t ha<sup>-1</sup>). Plants grown with added Mo and B fertilization tended to show greater number of pods plant<sup>-1</sup> and seeds

pod<sup>-1</sup>. Micronutrient application did not alter 1000-seed weight. The seed yield ha<sup>-1</sup> had good response against boron and the highest yield (2.72 t ha<sup>-1</sup>) was obtained with 1 kg B ha<sup>-1</sup> followed by 0.5 kg ha<sup>-1</sup> (2.70 t ha<sup>-1</sup>). Varieties and micronutrient interaction effect were significant on moisture content in seed after harvest, germination percentage, root and shoot length and seedling vigour index. Boron influenced seed germination for both the varieties. Seedling height and vigor index were also influenced by both molybdenum and boron regardless of varieties.

### **EFFECT OF NODAL POSITION IN SEED QUALITY OF SOYBEAN**

**F. Ahmed, M.S.A. Khan, M.T. Rahman and M.A. Hossain**

An experiment on effect of nodal position in seed quality of soybean was conducted during rabi season of 2007-2008. Seed quality of three nodal position viz., nodes of top, middle and bottom portion of plant were evaluated in three soybean varieties/line (BARI soybean 5, Sohag and Amber) in the present study. Nodal position and varietal effect on seed quality was significant. Seed size of middle nodes was higher than that of top and bottom nodes. Protein content (%) was significantly higher in seeds of top nodes than those of middle and bottom nodes while the oil content followed the reverse trend. Higher protein content (40%) was recorded in Amber while higher oil content (19%) was recorded in BARI soybean -5. Although nodal position and variety did not show any significant influence on vigor index. Comparatively higher vigor index was recorded in seeds of top nodes and it was higher in Amber.

## **GROWTH AND YIELD OF SOYBEAN AS AFFECTED BY DIFFERENT PERIOD OF SEED STORAGE**

**R.R. Saha, M.A. Hossain and W. Sultana**

An experiment was conducted at the research field of Seed Technology Division, BARI, Joydebpur, Gazipur during rabi season of 2007-2008 to evaluate the effect of storing period of soybean seeds under cold condition on stand establishment, growth and yield. The treatments were included five levels of storing period (32, 25, 20, 13, 8 months) and three soybean varieties (Sohag, Bangladesh soybean-4 and BARI soybean-5). Germination percentage did not differ markedly but electrical conductivity of seed leachate increased and field emergence percentage slightly decreased with increasing storing period in all the varieties. Variation of plant height due to the storing period of seeds was not consistent. Among the varieties, Bangladesh soybean- 4 produced tallest plant irrespective of storing period. Crop growth rate slightly varied under different storing period but the variation was not consistent at different growth stages. Seed yield and yield components did not differ significantly due to variations of seed storing period. Regardless of storing period, BARI soybean-5 produced the highest seed yield (1762 kg/ha), which was at par with that of Sohag (1685 kg/ha). From this study it is revealed that soybean varieties can be stored up to 32 months in cold condition without any significant loss of yield.

## **EFFECT OF HARVESTING STAGE ON QUALITY OF CHILLI SEEDS**

**A. Nessa, M.A. Hossain, M.N. Islam and M.M. Haque**

The field and laboratory studies on maturity in chilli varieties (BARI morich-1 and Hathaazari local) were carried out at the research field of Seed Technology Division, BARI during rabi season of 2007-2008 to determine the optimum stage of harvest to get higher seed yield with better quality. Fertilizers @ 120 kg N, 60 kg P, 80 kg K, 40 kg S/ha and 5 t cowdung/ha were used. The results indicated that BARI morich-1 performed better in respect of number of fruits/plant and yield compared to Hathaazari local. The seeds of chilli varieties attained maximum dry weight at 70 DAA followed by 63 DAA. At this stage fruits turned to red colour with average moisture content of around 29.65% and seed germination (96%) were found to be highest indicating crop attained physiological maturity. The vitamin- c content was varied greatly due to variation of harvesting stage. The highest vitamin- c was recorded at 30 DAA (Green stage) and onwards decreased. For seed purpose the chilli needs to be harvested around 63-70 days after anthesis (DAA).

## **STUDIES ON PRE-STORAGE SEED TREATMENT ON THE QUALITY OF CUCURBIT SEEDS**

**A. Nessa, M.N. Islam, M.A. Hossain and M.A. Rashid**

The experiment was conducted in the laboratory of Seed Technology Division, BARI, Gazipur during the period from December, 2007 to April, 2008 to find the storage potential of pre-treated cucurbit seeds under ambient condition. Seeds were treated with the following chemicals: T<sub>1</sub>) GA<sub>3</sub> (100

ppm) for 24 hours, T<sub>2</sub>) GA<sub>3</sub> (50 ppm) for 24 hours, T<sub>3</sub>) GA<sub>3</sub> (25ppm) for 24 hours, T<sub>4</sub>) NAA (25 ppm) for 24 hours, T<sub>5</sub>) NAA (50 ppm) for 24 hours, T<sub>6</sub>) 1% KNO<sub>3</sub> for 24 hours, T<sub>7</sub>) 2% KNO<sub>3</sub> for 24 hours, T<sub>8</sub>)CaCl<sub>2</sub> (0.5%) for 24 hours, T<sub>9</sub>)Salicylic acid (200 ppm) for 24 hours and T<sub>10</sub>) Control (Untreated seeds). The results revealed that pre-treated seeds of Bitter gourd, Snake gourd and Bottle gourd were better in performance compared to untreated seeds. Though there was a gradual decrease in percentage germination, seedling dry weight and vigour index. Seeds pre-treated with GA<sub>3</sub> 100ppm or CaCl<sub>2</sub> 0.5% or Salicyclic acid 200 ppm can be safely stored for a period up to four months. These growth regulators were found most effective in stimulating germination. On the other hand, pre-treated seeds of Ash gourd and Ridge gourd showed poor and erratic germination.

#### **EFFECT OF GA<sub>3</sub> TREATMENT ON GERMINATION AND VIGOUR OF TPS UNDER AMBIENT STORAGE CONDITION**

**A. Nessa, M.R. Shaheb, M. A. Hossain and T. K. Dey**

A Laboratory study on the effect of GA<sub>3</sub> on the germination of TPS was carried out during the period from December 2007 to March 2008 to study the storage potential of treated seeds or without treated seeds. There were three treatments viz. T<sub>1</sub>= seed treated with GA<sub>3</sub> @ 100 ppm before storage, T<sub>2</sub>= seed treated with GA<sub>3</sub> @ 100 ppm at the time of germination test and T<sub>3</sub>= Control (Untreated seed). The result indicated that TPS can be stored either as treated with GA<sub>3</sub> or untreated up to four months without loss of viability.

## STUDY ON SEED HEALTH STATUS OF GROUNDNUT AND SOYBEAN

M.N. Islam, M.M.-E-Rahman, M.M. Alam, M. Amin and M.A. Hossain

An experiment was conducted at Seed Technology Division, BARI, Joydebpur, Gazipur during the period from November 2007 to May 2008 to study the storage potential and prevalence microbes associated with groundnut (Dhaka-1, BARI Chinabadam-5, BARI Chinabadam -6 and BARI Chinabadam -7) and soybean (var. Sohag) seeds. Four genera of seed-borne fungal pathogens were observed to be commonly associated with groundnut seeds viz. *Aspergillus flavus*, *Aspergillus niger*, *Fusarium* sp. and *Sclerotium* sp. and soybean seeds viz. *Aspergillus flavus*, *Aspergillus niger*, *Fusarium* sp. and *Rhizoctonia* sp.. Among the pathogens, *Aspergillus niger* was the highest prevalence in the seeds of groundnut and *Fusarium* sp. in soybean seeds. Germination, vigor index and oil content of groundnut and soybean seeds were also variably affected depending on the variety and seed source. The results revealed that seeds of BARI Chinabadam-5 and BARI Chinabadam-6 are retained until 3 months of storage and having superior quality. On the contrary, germination rate, vigour index, oil and protein content of soybean seed samples collected from 19 farmers and BADC, Noakhali district ranged from 42 to 79%, 31.32 to 55.75, 19.47 to 20.26 % and 39.37 to 43.28%, respectively.

## STUDY ON SEED HEALTH STATUS OF FRENCH BEAN

M.N. Islam, M.M.-E-Rahman, M. A. Hossain, A. Nessa and M.A. Rashid

An experiment was conducted during 2007-2008 to find out the effect of storage on seed quality of French bean (BARI Jharseem-1 and BARI Jharseem-2). The seeds were stored in air tight tin container under ambient (25-30<sup>0</sup>C) and cool conditions (15-17<sup>0</sup>C). Four different fungi such as *Aspergillus flavus*, *Aspergillus niger*, *Cercospora* sp. and *Fusarium* sp. were identified. The highest prevalence *Fusarium* sp. was recorded in French bean seeds. The prevalence of seed borne fungi was less under cool storage condition. Germination percent, seedling dry weight and vigor index of French bean varieties increased up to 4 months of storage afterwards, a gradual decrease was observed in seed quality characteristics.

## RESPONSE OF LENTIL GENOTYPES TO VARIABLE AGRO-CLIMATIC CONDITION

A. Nessa, M.M. Rahman, M.Ashraf Hossain and M.A. Hossain

Twenty six genotypes/lines 8618, 9926, 91517, 9945, 7981, 4605, 7723, 8009, 9944, 7979, 9931, 4404, 9949, 9989, 9930, 9994, 9927, 9951, 6024, 9985, 7980, 9877 and were evaluated including three check varieties BARI Masur-4, BARI Masur-5, BARI Masur-6 at Jessore, Ishurdi and Joydebpur during rabi season of 2007-2008 to find out the suitable genotypes of lentil for specific location in respect of yield and seed quality. The result revealed that genotypes 9877, 9951, 8618, 7979, 7980, 4605 and 91517 gave higher yield at Jessore. At Ishurdi, genotypes 9926, 9927, 9989 and 9945 were

found out yielded over the check varieties. The trial under Joydebpur condition 8618, 9926, 91517, 9945, 7981 & 4605 genotypes were produced higher yield than BARI Masur-6. Genotypes 8618, 9926, 91517, 9945, 9994, 7981, 9927, 9989, 9877, 7979, 7980 and 4605 were selected for further trial.

### **GERMINATION RESPONSE OF TOMATO AND CAULIFLOWER AT HIGH TEMPERATURE REGIME**

**A. Nessa, M.A. Hossain, M.N. Islam, S.R. Saha and M. Rashid**

A laboratory studies on germination of Cauliflower (var. BARI Cauliflower-1 and BARI Cauliflower-2) and tomato (var. BARI tomato-13 (Srabani), BARI tomato-3, BARI tomato-10 (Anupama) and BARI F<sub>1</sub>-4) at four temperatures (room temperature, 33<sup>0</sup>C, 36<sup>0</sup>C and 39<sup>0</sup>C) was carried out during the period from January to February 2008 to identify the high temperature tolerance varieties. The results revealed that the temperature up to 36<sup>0</sup>C was better for enhancing germination of cauliflower. However, seeds of Cauliflower were also germinated at 39<sup>0</sup>C but the seedlings were died after one day. On the contrary, seeds of tomato varieties showed maximum germination recorded at 33<sup>0</sup>C. The seeds of BARI tomato-10 (Anupama) also showed 75% germination at 36<sup>0</sup>C.

## *Future Strategies*

- ☞ Research activities on quality seed production, processing and preservation of different crops.
- ☞ Development/improvement of low-cost indigenous or home storage methods of seed for preservation at ambient temperature.
- ☞ Study on seed health status of BARI mandate crops.
- ☞ Study on the quality parameters of seeds of crops.
- ☞ Dissemination of technology to the end users.

### Scientists Currently Working in the Division

<b>Name</b>	<b>Designation</b>
Md. Altab Hossain Ph.D	Principal Scientific Officer
Ashratun Nessa M.Sc	Principal Scientific Officer
M. Siddiqur Rahman Ph.D	Senior Scientific Officer
Parimal Chandra Sarker M.Sc (Ag.)	Senior Scientific Officer
Shamim Ara Begum B.Sc. Ag. (Hons.)	Scientific Officer
Md. Bazlur Rahman B.Sc. Ag. (Hons.)	Scientific Officer
Md. Rayhan Shaheb M S	Scientific Officer
Md. Nazmul Islam M S	Scientific Officer