**EFFECT OF PLANT SPACING AND FERTILIZER DOSE ON SEED YIELD AND QUALITY OF ONION**

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A field experiment was conducted at the research farm of Regional Agricultural Research Station (RARS), BARI, Cumilla, Bangladesh during 2020-2021 to identify a suitable plant spacing along with fertilizer dose for higher seed yield with better seed quality of onion. The experiment was carried out in a split-plot design where three plant spacing viz., 30 cm X 20 cm (S1), 25 cm X 20 cm (S2) and 20 cm X 20 cm (S3) were assigned in main plots and four fertilizer doses viz., chemical fertilizer recommendation of FRG 2018 (F1), IPNS based fertilizer (F2), Soil test based fertilizer (F3) and Farmer’s practice (F4) were assigned in sub-plots. Onion variety was BARI Piaj-6. Plant spacing showed significant variation on number of plant population per square meter, number of seed per umbel, thousand seed weight, seed yield per plant and seed yield per hectare of onion. Fertilizer dose showed significant difference on number of umbel per plant, number of seed per umbel, seed yield per plant, and seed yield per hectare. But their interaction effect showed significant difference only on number of umbel per plant. Seed germination per cent, seedling length and seedling vigor index were found nonsignificant in case of individual as well as interaction effects. Though insignificant, plant spacing 20 cm X 20 cm along with IPNS based fertilizer dose may be suggested regarding highest seed yield (809 kg ha-1), gross return (Tk. 1213500 ha-1) and gross margin (Tk. 1091430 ha-1) of onion (var. BARI Piaj-6) for Cumilla region.

**EFFECT OF VERMI-COMPOST STIMULATED INTEGRATED NUTRIENT MANAGEMENT ON SEED YIELD AND QUALITY OF ONION**

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The study was undertaken at Agricultural Research Station, BARI, Dinajpur during October, 2020 to June, 2021 to find out a suitable vermicompost based integrated nutrient management system for quality seed production of onion. The experiment was laid out in a randomized complete block design with three replications. Six treatments viz. T1: Recommended dose of chemical fertilizer (FRG’2018), T2: T1+ 1 Ton Vermicompost ha-1, T3:T1+ 2 t Vermicompost ha-1, T4: T1+ 3 Ton Vermicompost ha-1, T5: T1+ 4 Ton Vermicompost ha-1, and T6: T1+ 5 Ton Vermicompost ha-1 were tested. The results revealed that seed germination percentage and seedling vigor index were found insignificant. Vermicompost @ 4 ton/ha along with inorganic fertilizer (105-45-60-20-2-1.5 kg ha-1 of NPKSZnB, respectively) gave the highest seed yield (689 kg ha-1) of onion (var. BARI Piaj-4) which was 26.42% higher than sole inorganic fertilizer.

**EFFECT OF VERMICOMPOST LEACH ON SEED GERMINATION AND SEEDLING EMERGENCE OF ONION SEEDS AGAINST DROUGHT STRESS**

P. C. SARKER, M. S. RAHMAN, I. M. AHMED AND A. K. CHOUDHURY

A laboratory experiment was conducted at the Seed Technology Division, BARI, Gazipur, Bangladesh during 2020-2021 find out a suitable vermicompost treatment for better seed germination and seedling emergence under drought stress condition. The experiment was carried out in a 2-factorial completely randomized design. The seeds of onion were imposed by five levels of priming viz., untreated control, 5% VCP, 10% VCP, 15% VCP, and hydropriming. After that two levels of drought viz., 10% PEG 6000 and 15% PEG 6000 were imposed on onion seeds. Onion variety was BARI Piaj-4. Seed priming with vermicompost leach had a positive impact enhancing seed germination and seedling emergence percentage under drought stress condition. Vermicompost leach @ 10% under 10% PEG drought stress condition showed better performance than any other treatment combination regarding seed germination (90%), seedling emergence percentage (81%), seedling vigor index (614), germination rate index (22.84), promptness index (123) and germination stress tolerance index (84.25%).

**EFFECT OF VERMICOMPOST LEACH ON SEED GERMINATION AND SEEDLING EMERGENCE OF ONION SEEDS AGAINST SALT STRESS**

P. C. SARKER, M. S. RAHMAN, R. SEN, I. M. AHMED AND A. K. CHOUDHURY

A laboratory experiment was conducted at the Seed Technology Division, BARI, Gazipur, Bangladesh during 2020-2021 to find out a suitable vermicompost treatment for better seed germination and seedling emergence under salt stress condition. The experiment was carried out in a 2-factorial completely randomized design. Onion seeds (var. BARI Piaj-4) were imposed by five levels of priming viz., untreated control, 5% VCP, 10% VCP, 15% VCP, and hydropriming, and then salt stress was imposed @ 40 mM NaCl and 80 mM NaCl. Seed priming with vermicompost leach has a positive impact enhancing seed germination percentage, seedling emergence percentage, average seedling dry weight and seedling vigor index under salt stress condition. Seed priming with 10-15% vermicompost leach along with 40 mM NaCl showed better performance than any other treatment combination with respect to seed germination (84-86%), seedling emergence percentage (64-66%) and seedling vigor index (247-254). Therefore, these treatments showed better performance considering less reduction than any other treatment combination regarding seed germination percentage, seedling emergence percentage, average seedling dry weight and seedling vigor index.

# GROWTH AND QUALITY SEED PRODUCTION OF ONION INFLUENCE BY PLANT GROWTH REGULATOR (GA3)

S.A. BAGUM

The experiment was carried out at the research field and laboratory of Seed Technology Division, BARI, Gazipur during *rabi* season of 2019-20 and 2020-21, to study the effect of different concentrations of application of GA3 on growth, seed yield and quality seed production of onion and to find out the suitable GA3 concentrations. The experiment was laid out in RCBD with four treatments combinations *viz.* T1= Control (0.0 ppm GA3), T2= 100 ppm GA3, T3= 200 ppm GA3, and T4= 300 ppm GA3. The bulbs were soaked in treatment wise concentrations of the GA3 in tray for 48 hours then sowing directly in experimental filed plots. The earliness (10-12 days) of bolting and bolting period was found from treated onion bulbs with GA3 at 300 ppm compared to the control. The maximum no. of leaves (37.5 and 38.0 during 2019-20 and 2020-21, respectively), no. of branch per plant (5.0 and 5.6 during 2019-20 and 2020-21, respectively), no. of umbel per plant (6.0 and 6.35 during 2019-20 and 2020-21, respectively), seed weight per umbel (1.90 g and 1.95g during 2019-20 and 2020-21, respectively) and yield (775.78 kg and 789 kg during 2019-20 and 2020-21, respectively) was obtained from onion bulbs soaked with 300 ppm concentrations of the GA3 in tray for 48 hours before sowing in the field. So, it was concluded that onion bulb treated with 300 ppm GA3 before 48 hours sowing for high quality seed production, growth and yield of onion seed of BARI Piaz-1.

# HYBRID SEED PRODUCTION OF BARI HYBRID MISTIKUMRA-1

S.A. BAGUM

The field experiment was carried out during 2020-21 *rabi* at Seed Technology Division, BARI, Gazipur-1701. to increase the quality hybrid seeds stock of BARI Hybrid Mistikumra-1 for demonstration and distribution. The seed of parental lines of BARI Hybrid Mistikumra-1 was obtained from the of Olericulture Division, Horticulture Research Center, BARI, Gazipur. The seedlings were raised in controlled conditions and 30 days old seedlings were transplanted one seedling per hill at the spacing of 3.0 m x 1m. Planting ratio was 3:1 was applied i.e. 3 female and 1 male. During sowing time of male plant was sowed 10 days after females for synchronization of flowering. Finally, 3.0 kg quality hybrid mistikumra seed was harvested and keep safe store for distribution.

**EFFECT OF FERMENTATION DURATION ON SEED QUALITY OF Bt BRINJAL**

## A.N.MD. ANAMUL KARIM, M. A. HOSSAIN AND A. K. CHOUDHURY

The experiment was carried out at the laboratory of Seed Technology Division, BARI, Gazipur during 2021, to find out the proper fermentation duration on seed quality of Bt brinjal. The experiment was laid out in CRD with 10 treatment combination of five fermentation duration viz., F1=Control (0 hr), F2= 8 hrs, F3= 16 hrs, F4=24 hrs and F5=48 hrs. and two Bt brinjal varieties i.e. V1= BARI Bt Begun-2 and V2= BARI Bt Begun-4. The results indicated that the 16 hrs. Fermentation duration of BARI Bt Begun-2 noticed significantly higher purity (93%), 1000 seeds weight (94.66 g), germination (94.66%), seedling length (13.70 cm), seedling dry weight (1.73 g) and seedling vigor index (165.0).

**EFFECT OF GA3 ON SEED YIELD OF GARDEN PEA**

A. N.MD. ANAMUL KARIM, M. A. Hossain aND A. K. Choudhury

The experiment was carried out at the research field and laboratory of Seed Technology Division, BARI, Gazipur during 2020-2021 to find out the effect of appropriate concentration of GA3 for better growth, seed yield and quality of garden pea. The plant growth regulator (GA3) was applied as foliar application at 15, 30 and 45 DAS. Looking to the result, it was noticed that the GA3 (200 ppm) application as foliar spray gave significantly yield attributes and seed quality of BARI Motorshuti-3 such as plant height (51.62 cm), numbers of pods/plant (17.26), numbers of seeds pod-1 (17.26), 1000 seed weight (254.46 g), germination percent (97.04 %), seedling dry weight (0.084 g), vigor index (2.52) and protein content (26.26%). Therefor it may be concluded that foliar application of GA3 at 200 ppm can be recommended to BARI Motorshuti-3 for obtaining better yield attributes and seed quality.

**EFFECT OF GA3 AND TIME OF APPLICATIONON SEED YIELD AND QUALITY OF SOYBEAN**

M. A. HOSSAIN, P. C SARKER, S. A. BAGUM, A. N. Md. KARIM, M. ISLAM, M. S. RAHMAN AND A. K. CHOUDHURY

The experiment was carried out at the research field and laboratory of Seed Technology Division, BARI, Gazipur during rabi season of 2020-21 to study the effect of plant growth regulator (GA3) on seed yield and quality of Soybean at different stages of application. The factorial experiment was laid out in RCBD with 12 treatment combination of four different plant growth regulators viz., H0 = Control (water), H1= GA3 (50 ppm), H2= GA3 (100 ppm), H3= GA3 (150 ppm) and three different time of application i.e. S1= Vegetative stage, S2= Flower initiation stage, S3 = Pod formation stage. Soybean variety was BARI Soybean-6. The results indicated that the application of growth regulators GA3 100 ppm (H2) noticed significantly higher plant height (78.64 cm), number of seeds per pod (2.77) and seed yield (2.54 t/ha). Better seed quality parameter such as 100- seed weight (15.826 g), germination percentage (89.33 %) and vigour index (10884) were also noticed from GA3 100 ppm (H2). Among the different time of application, pod formation stage (S3) recorded significantly higher number of pods per plant (116.28) along with seed quality parameters viz., 100- seed weight (15.986 g), germination (88.00 %), and seedling vigour index (10883). So the treatment combination of GA3 100 ppm at pod formation stage was found suitable for seed yield (2.67 t ha-1) and quality of Soybean crop.

**REMOVAL EFFECT OF LATERAL VINES ON SEED YIELD AND QUALITY OF BOTTLE GOURD**

M. A. HOSSAIN, P.C. SARKAR, S.A. BEGUM, A.N.M. KARIM, M. ISLAM, M. S. RAHMAN AND A. K. CHOUDHURY

The experiment was carried out at the research field and laboratory of Seed Technology Division, BARI, Gazipur during rabi season of 2020-21 to investigate the removal of lateral vines for quality seed production of bottle gourd. The seed yield and quality parameters like length of fruits (cm), diameter of fruits (cm), individual fruit weight (kg), seed yield (t ha-1), 100 seed weight (gm), germination percentage, seedling dry weight and vigor index were influenced significantly due to removal effect of lateral vines on seed yield and quality of Bottle gourd. In Bottle gourd, the maximum length of fruits (58.43 cm), diameter of fruits (49.80 cm), Individual fruit weight (7.027 kg), and seed yield (1.210 t ha-1) were observed in the treatment (T4) removal of lateral vines up to 1.5 m. Among the treatments, (T4) removal of lateral vines up to 1.5 m showed significantly better seed quality parameters such as 100 seed weight (27.11 g), germination percentage (96.00 %), seedling vigor index (11043) and seedling dry weight (113.93 mg).

**EFFECT OF PRE-SOWING INVIGORATION SEED TREATMENT WITH MICRONUTRIENTS ON MOTHER BULB YIELD OF ONION**

**M. S. RAHMAN, S. BISWAS, P. C. SARKER, M. A. HOSSAIN AND A. K. CHOUDHURY**

The quality of the onion seed is an important factor in their growth and development and yield under field conditions. Therefore, the methods for improving their vigor through priming especially with micronutrients enhancing germination to increase yield. The objective of the present study was to examine the effect of seed priming with different concentrations (0, 0.5, 1.0, 1.5, and 2.0%) of micronutrients (Zn, and B) on the growth and yield characteristics of mother bulb of onion. It was found that seeds primed with 1.0, 1.5, and 2.0% Zn significantly increased germination. Their priming with 2.0% Zn resulted in the highest bulb diameter with lowest bulb neck diameter and TSS. The highest total bulb yield was obtained under the priming with 0.5% Boron but the highest mother bulb yield was obtained from priming with 2.0% Zn. It is recommended to prime onion seed with 2.0% Zn as pre-sowing invigoration nutripriming for better emergence (15% better over untreated) and mother bulb yield (17% higher over untreated) with higher storability.

**IMPROVING FIELD EMERGENCE PERFORMANCE OF SOYBEAN BY SAND MATRIX PRIMING**

M. S. RAHMAN, U. KULSUM, A. HOSSAIN, M. ISLAM, A. K. CHOUDHURY

A priming method called sand priming was developed using sand as a priming solid matrix. The effect of sand priming on improving the field emergence performance of soybean was investigated. The ratio of water volume: seed volume: sand volume was 1:2:2. Seeds were uniformly embedded in the wet sand and incubated at 25ºC for 24 hr, 48 hr, 72 hr, and 96 hr in darkness. Sand matrix priming for 24 hr improves the emergence and yield of soybean. The relative possibility of emergence and yield was increased by 123% and 112%, respectively.

**SEED QUALITY OF BOTTLE GOURD AS AFFECTED BY FRUIT SIZE AND SEED POSITION**

M. ISLAM, M. A. HOSSAIN AND A.K. CHOUDHURY

An experiment was conducted in the experimental field and laboratory of seed technology division, BARI, Gazipur during rabi season 2020-21 to find out the effect of fruit size and seed position on seed quality of bottle gourd. Seeds were collected from three parts viz proximal, middle and distal portion of large, medium and small size fruit. Maximum number of seeds/fruit (394) were collected from distal portion of large size fruit that showed higher seed yield (107.15g), superiority in germination (100%) and higher germination speed.

**IMPACT OF FOLIAR BORON SPRAYS ON SEED YIELD AND SEED QUALITY OF CAPSICUM**

M. ISLAM, M. S. RAHMAN AND A.K. CHOUDHURY

An experiment was conducted under pot culture and laboratory of Seed Technology Division, BARI, Gazipur during rabi season 2020-21 to find out the effect of foliar application of Boron on plant growth, seed yield and quality of capsicum. The doses of Boron were 0ppm (control), 150ppm, 200ppm, 250ppm, 300ppm and 350ppm. Boron was applied as Boric acid (17.5% B) according to treatments spraying at pre-flowering and flowering stage in capsicum plant. Maximum number of fruits per plant (4.50), fresh weight of fruit (80.25 g), seeds per fruit (161), number of seeds per plant (727.25), % germination (78.25%), root length (2.75 cm) of seedling, shoot length (2.94 cm) of seedling, vigor index (1.833) were found when plants were supposed to foliar spraying of Boron @250 ppm. The tallest plant was found from 150 ppm spray. Seed quality parameters was found in the treatment of 200 ppm Boron in case of root length, shoot length and seedling length and vigor index of seedling. Maximum fruit length (7.70 cm) with average fresh weight of fruit (75.25 g) was obtained from 350 ppm spray of Boron in capsicum.

# ASSESSMENT OF SEED QUALITY OF GROUNDNUT THROUGH ACCELERATED AGING METHOD

S. A. Bagum

Seedling growth depends on consequence of seed deterioration. An experiment was conducted to evaluate the effects of duration of seed aging on groundnut seeds quality characteristics on groundnut varieties. Experiment conducted as completely randomized design with 3 replications. Seeds were subjected to accelerated aging treatment for, 24, 48 72 and 96 hours at 45 ±1 C° and 100% relative humidity. These artificially aged seeds were compared to control (Unaged seeds) for evaluation of seed quality parameters. The percentage of groundnut seeds that germinated was significantly affected by accelerated aging of up to four days. Accelerated aging reduced seedling length, seed vigor index, germination speed index, and shoot, root fresh and dry weight, in addition to lowering germination percentage. BARI Badam-10 showed high quality seed and long-time storability in storage. Finally, the findings demonstrated that rapid aging reduced the viability of groundnut seeds.

**INFLUENCE OF CHEMICALS AND CRUDE PLANT MATERIALS AS PRE-STORAGE TREATMENT ON SEED QUALITY OF ONION**

M. S. RAHMAN, I. AHMED, M. M. H. Tipu AND A. K. CHOUDHURY

Fresh onion seeds dried to 7.0% seed moisture content were stored with crude plant materials (red chili powder@20g/kg of seed; neem leaf powder@ 20g/kg of seed, lemon leaf powder @ 20g/kg seed), and chemicals (common bleaching powder and mancozeb @ 2g/kg of seed). The germination potential of onion seeds was found satisfactory in treated seeds. Water uptake during imbibition was maximum in lemon leaf treated seed which indicates better germination as the imbibition of water is an essential part of germination. A high correlation between EC measurements and germination was found; which indicates that conductivity readings have the potential to provide a rapid assessment of standard laboratory germination. In terms of seed-associated pathogens during storage, chemicals have shown better results in suppressing pathogens.

**EFFECT OF DIFFERENT PACKAGING MATERIALS AND STORAGE CONDITION ON QUALITY OF SESAME SEED DURING STORAGE**

M. ISLAM, M. S. RAHMAN, M. A. HOSSAIN AND A.K. CHOUDHURY

An experiment was conducted in the laboratory of Seed Technology Division, BARI, Gazipur during October 2020 to June 2021 find out the effect of packaging materials and storage condition on seed quality of sesame. The packaging materials were polyethylene bag of 0.06mm thickness, polyethylene bag of 0.03mm thickness, plastic container and earthen pot. Seed were stored for a period of 8 months in two types of storage environments : dry cold room (15-18 °C and 55% RH) and ambient condition. Seed stored in plastic container showed maximum germination (78.667%), germination speed (16.569), seedling vigor index I and seedling vigor index II (532.58) either kept in ambient storage or cold storage. Maximum mean seedling length (7.256cm) was found in 0.03mm thick polythene bag and similar result was found in case of 0.06 mm thick polythene bag and plastic pot. Earthen pot showed maximum electrical conductivity and seedling dry weight. Initial germination%, germination speed, seedling length, seedling vigor index I and seedling vigor index II were increased after 2 months of storage and then decreased gradually with storage duration up to 6 months.

 **DOCUMENTATION OF INDIGENOUS STORAGE PRACTICES OF PULSE SEED**

M. S. RAHMAN, P. C. SARKER AND A. K. CHOUDHURY

Storage of pulse seed is a crucial postharvest operation. But storage practices vary over local natural resources, climate and culture of the society. This study assessed indigenous storage system of pulse seed in selected six pulse growing districts of Bangladesh. Data were collected from 180 sample farmers through survey method and multistage stratified random sampling technique was followed to select these farmers. It was observed that farmers mostly cultivated mungbean, grass pea, lentil, chickpea, blackgram and pea of which mungbean, lentil and grasspea covered 84% of the total pulse crop cultivation. Sun drying was found to be the mostly practiced traditional seed drying system accounted for 100% of the respondents. A number of storage materials were used in the survey areas of which plastic drum was found to be the mostly adopted storage materials. Survey farmers were found to treat seed before storing for future use. Overall, 42% of the total surveyed farmers used neem leaves as treating materials while 24% did not apply any treatment. This indigenous methods of storage can protect pulse seeds from damages and enhances use of locally available cheaper materials for the farmer.