

Full Length Research Paper

Effect of storage materials on seed quality and health in Jute variety O-9897

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The experiments were conducted in Jute Agriculture Experimental Station (JAES) and Kishoregonj Regional Station (KRS) of BJRI during the period April 2012 to January 2013. The present study was carried out with the objective was to find out suitable storage materials for quality jute seeds and fibre production. Six different types of containers viz. tin pot, plastic pot, poly bag, gunny bag lined with polythene, cloth bag, and International Rice Research Institute (IRRI) innovated poly bag were used for the present study. Seeds stored in tin pot had the best performance in respect of germination, plant height, plant/m², base diameter, number of branch, number of pod, stick yield, fibre yield and seed yield. Health condition of seeds were also superior compared to other storage materials. The highest total disease incidence (12.84%) at KRS was recorded by using seeds of plastic pot. Lowest disease incidence (6.35%) was observed at KRS by using seeds stored in tin pot. The highest fibre yield (2.98 ton/ha), stick yield (5.91 ton/ha) and seed yield (368.44 kg/ha) were recorded by using seeds of tin pot. Quality of jute seeds can be maintained by storage in tin pot and proper moisture content (9.5%).

Key words: Container, disease, seed quality.

INTRODUCTION

Jute is one of the mainstay of Bangladesh economy. It accounts for about 6% of the foreign currency earnings from exports (Islam, 2009). The crop is versatile and environmental friendly biodegradable natural fibre widely grown in Asia, particularly in Bangladesh, India and China. It is a rapid growing renewable biomass and photo-reactive crop with only 120 days harvesting period. It is mainly grown for fibre rather than the seed. Two species of jute (*Corchorus capsularis* and *Corchorus olitorius*) are

cultivated in Bangladesh. The land and climatic conditions of Bangladesh are congenial for the production of high quality jute (Islam, 2009). In Bangladesh, about 0.709 million hectares of land was under jute cultivation and the total yield was 8.40 million bales (BBS, 2011; IJSG website, 2012-2013). Jute suffers from more than 13 different diseases (Fakir, 2001) and 10 of them are seed borne. Seeds having higher seed borne infection results to significantly higher amount of disease

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development in the field such as spot gradually increased lengthwise, encircled the stem, which internally rots and broken the plant is called stem rot, lesions coalesced to form a big canker, sometimes girdling the stem and shredded the fibre is called anthracnose, in case of die back plant dry from the tip downwards at almost full-grown stage. Among the seed-borne fungal diseases, stem-rot, black-band, and anthracnose caused by *Macrophomina phaseolina* (Tassi, Goid.), *Botryodiplodia theobromae* and *Colletotrichum corchori*, respectively are frequently transmitted through jute seeds (Fazli and Ahmed, 1960; Ahmed, 1966; Fakir et al., 1991).

M. phaseolina alone can cause 10% yield loss (Ahmed, 1968). Stem rot, black band, anthracnose, foot rot and wilt (*Rhizoctonia solani*) and leaf mosaic (virus) are responsible for seed rot, pre and post emergence damping off seedlings, spread of the diseases to standing crops and loss and deterioration of quality of fibre (Ahmed, 1966; Ahmed and Islam, 1980; Biswas et al., 1985). Yield loss due to seed borne diseases of jute is 8 to 20% depending on the severity of jute diseases from year to year (Ahmed and Sultana, 1985). Infected jute seed fail to germinate or the young seedlings emerging from the infected seed die. Infection of jute seed causes germination failure, post emergence damping off and seedling blight (Fakir, 1989). Jute seedlings or growing plants produced in the field from the infected seeds and escaping early infection may often be infected at the later stages of their growth by the primary seed borne inocula grown and multiplied on the infected dead seeds and seedlings. Later on, these inocula may be transmitted to the healthy growing plants of the same or neighboring plants or even neighboring fields resulting to disease outbreak, often in epidemic form. Seed borne pathogens causing diseases on the growing jute plants in the field quite often attack the capsules or pods and subsequently infect the seed, resulting to production of infected or unhealthy seeds. Considering the above facts, the present study was carried out with the objective was to find out suitable storage materials for quality jute seeds and fibre production.

MATERIALS AND METHODS

Experimental sites and period

The experiments were conducted in Jute Agriculture Experimental Station (JAES), Manikgonj and Kishoregonj Regional Station (KRS), Kishoregonj of BJRI during the period of April 2012 to January 2013.

Containers used

T₁ = Tin pot, T₂ = Plastic pot, T₃ = Poly bag having 25 µm thickness, T₄ = Gunny bag lined with polythene, T₅ = Cloth bag and T₆ = IRR1 Poly bag (Super Grain bag II Z) having 78 µm thickness seeds were stored for 12 months.

Experimental design

The experiments were conducted in the field with Randomized Block Design (RCBD) having three replications. The size of the unit plot was 10 m² (5 m × 2 m) and the distance between plots and replications were 1.0 m and 1.0 m, respectively.

Soil characteristics and nutrient status

The soil characteristics and nutrient status of the two experimental stations are shown in Table 1.

Application of fertilizers

Urea 180 kg (3 times), Triple Super Phosphate 50 kg and Muriate of Potash 25 kg per hectare were applied according to previous report (Islam, 2009; Islam and Rahman, 2008).

Sowing of seeds

Seeds were sown in line on 20 April, 2012 in Kishoregonj Regional Station (KRS), Kishoregonj and 2nd May, 2012 in Jute Agriculture Experimental Station (JAES), Manikgonj. Row to row and plant to plant distance were maintained as 1 M and 1 M, respectively. The seed rate for O-9897 was 4 kg per hectare.

Data collection

Data on different parameters were collected as shown:

1. Field emergence (germination %);
2. Plant stand/ plant population;
3. Incidence of diseases (%);
4. Plant height (M);
5. Base diameter (mm);
6. Fibre yield per plant (gm) and per hectare (ton);
7. Stick yield per plant (gm) and per hectare (ton);
8. Average number of branch per plant;
9. Average number of fruits per plant;
10. Seed yield per plant (gm) and per hectare (kg).

Disease incidence

Seedling blight (*R. solani* and *C. corchori*)

At seedling stage the basal portion of the plant showed brownish to blackish lesion and finally the plant died. Seed and soil borne pathogen were responsible for this disease.

Stem-rot (*M. phaseolina*)

Leaf turned pale gray color in the mid rib and turns black. The spot gradually increased lengthwise, encircled the stem, which internally rots and broken the plant. As a result the plants died.

Anthracnose (*C. corchori*)

This disease is confined only to *C. capsularis* variety. Lesions coalesced to form a big canker, sometimes girdling the stem and shredded the fibre.

Table 1. Soil characteristics and nutrient status of the two experimental locations in 2012.

| Experimental location | AEZ | Soil characteristics | | | Nutrient status | | | |
|-----------------------|---------------------------------------------------|----------------------|-----------------|------|-----------------|------|---------|-------------|
| | | Land type | Soil type | pH | % OM | % N | P (ppm) | K (meq/100) |
| JAES | Active Brahmaputra and Jamuna Flood Plain (AEZ-7) | Medium land | Sandy and Silty | 6.69 | 1.79 | 0.35 | 14.38 | 0.138 |
| KRS | Old Brahmaputra Flood Plain (AEZ-9) | Medium land | Loam | 6.11 | 1.24 | 0.39 | 14.98 | 0.15 |

Black-band (*B. theobromae*)

The lesion first appeared as small blackish brown patch, which gradually enlarged and encircled the stem making a black band around. This disease is seed, soil and air borne.

Die back (*Glomeralla cingulata*)

Jute and kenaf plants usually the olitorius varieties begin to dry from the tip downwards at almost full-grown stage. This fungus is seed and air borne.

Wilting (*R. solani*)

Root system of affected plant becomes infested with a soil borne fungi. All the leaves become flaccid at a time and after few days drooping occurs.

Soft-rot (*Sclerotium rolfsii*)

The disease appeared first near the ground level. Profuse white cottony mycelial growth occurs at the collar region of jute crop.

Leaf mosaic (Virus)

Yellow mosaic spots regular or irregular appeared usually on capsularis plants at any stage of growth and affected formation of chlorophyll.

Root knot (*Meloidogyne javanica* and *M. incognita*)

Attack at early stage caused stunted and poor growth of

plants with abnormal swollen tip and also produced severe gall formation in root systems.

Field emergence (germination %)

Four hundred seeds were taken randomly from the well mixed seed samples. The working samples were divided into four replications and thus one replication contains 100 seeds. To ensure adequate spacing, the seeds were germinated on soil in experimental plots. Seeds were counted as germinating seeds after four days. The results were expressed in percentages.

Harvesting of fibre

Jute crop of both species were harvested at field duration of 120 days from the jute plants grown in different blocks. The crop was harvested after 120 days of sowing. After being harvested, bundles of plants leave were heap in dry jute field for four days to make defoliation. Fibre yield per plant and hectare were recorded.

Harvesting of stick

Fibre stick yield of both species were harvested from the jute plants grown in different blocks. Stick yield per plant and hectare were recorded.

Harvesting of pods

The ripening pods (65 to 75%) were harvested from the jute plants grown in different blocks as per different seed

production methods. Seeds were extracted from the harvested pods, dried and seed yield per plant and hectare were recorded.

Statistical analysis

Data were analysed statistically and treatments effects were compared by Duncan's Multiple Range Test (DMRT) (Gomez and Gomez, 1984).

RESULTS AND DISCUSSION**Disease incidence in O-9897 at JAES and KRS, BJRI**

Altogether six seed borne fungal diseases (seedling blight, stem rot, black band, die back, soft rot and root knot) were recorded. Anthracnose and mosaic diseases were not found in olitorius varieties for their cell structures. Total disease incidence such as well as individual disease incidence varied independently each other with respect to different types of storage containers, variety and locations (Table 2). The highest stem rot (3.73%), black band (2.73%), die back (3.25%) and soft rot (1.96%) were recorded in the field by using seeds stored in poly bag, plastic pot, cloth bag and poly bag, respectively at KRS and lowest stem rot (1.64%) and soft rot (0.50%) were recorded using seeds stored tin pot

Table 2. Effect of seeds stored in different types of containers on disease incidence in O-9897 at JAES and KRS, BJRI following line sowing method in the field.

| Container | % Major disease incidence recorded in | | | | | | | | | | | | | |
|-----------------------|---------------------------------------|-------------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|----------------|------------------------------|
| | JAES | | | | | | | KRS | | | | | | |
| | Seedling blight | Stem rot | Black band | Die back | Soft rot | Root knot | Total disease | Seedling blight | Stem rot | Black band | Die back | Soft rot | Root knot | Total disease |
| T ₁ | 0.00 (0.71) | 1.67 ^{bc} (1.47) | 1.42 ^{cd} (1.39) | 1.72 ^c (1.49) | 0.50 ^c (1.00) | 1.64 ^b (1.46) | 10.51 ^d (3.32) | 0.39 ^c (0.94) | 1.64 ^b (1.46) | 1.63 ^c (1.46) | 1.63 ^d (1.46) | 1.06 ^b (1.25) | 0.00 (0.71) | 6.35 ^d (2.62) |
| T ₂ | 0.00 (0.71) | 1.97 ^{abc} (1.57) | 2.34 ^a (1.69) | 2.72 ^a (1.79) | 1.40 ^b (1.38) | 2.43 ^a (1.71) | 23.09 ^b (4.86) | 1.54 ^a (1.43) | 3.49 ^a (2.00) | 2.73 ^a (1.80) | 3.13 ^{ab} (1.91) | 1.95 ^a (1.57) | 0.00 (0.71) | 12.84 ^a (3.65) |
| T ₃ | 0.00 (0.71) | 2.46 ^a (1.72) | 1.78 ^{bc} (1.51) | 2.55 ^a (1.75) | 1.41 ^b (1.38) | 2.33 ^a (1.68) | 21.92 ^b (4.73) | 1.60 ^a (1.45) | 3.73 ^a (2.06) | 1.96 ^b (1.57) | 2.22 ^c (1.65) | 1.96 ^a (1.57) | 0.00 (0.71) | 11.47 ^b (3.46) |
| T ₄ | 0.00 (0.71) | 2.31 ^{ab} (1.68) | 2.02 ^{ab} (1.59) | 2.18 ^b (1.64) | 1.42 ^b (1.39) | 2.18 ^a (1.64) | 26.07 ^a (5.15) | 1.09 ^{ab} (1.26) | 3.50 ^a (2.00) | 2.55 ^a (1.75) | 2.66 ^b (1.78) | 1.59 ^{ab} (1.45) | 0.00 (0.71) | 11.39 ^b (3.45) |
| T ₅ | 0.00 (0.71) | 2.07 ^{abc} (1.60) | 1.18 ^d (1.30) | 1.24 ^d (1.32) | 1.23 ^b (1.32) | 2.13 ^a (1.62) | 18.40 ^c (4.35) | 0.82 ^{bc} (1.15) | 3.54 ^a (2.01) | 2.23 ^a (1.65) | 3.25 ^a (1.94) | 1.09 ^{ab} (1.26) | 0.00 (0.71) | 10.93 ^b (3.38) |
| T ₆ | 0.00 (0.71) | 1.43 ^c (1.39) | 1.72 ^{bc} (1.49) | 2.54 ^a (1.74) | 1.29 ^a (1.34) | 2.16 ^a (1.63) | 16.98 ^c (4.18) | 0.50 ^c (1.00) | 1.80 ^b (1.52) | 2.42 ^a (1.71) | 2.77 ^{ab} (1.81) | 1.12 ^{ab} (1.27) | 0.00 (0.71) | 8.61 ^c (3.02) |
| Level of significance | NS | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | NS | 0.05 |

T₁ = Tin pot; T₂ = Plastic pot; T₃ = Poly bag; T₄ = Gunny bag lined with polythene; T₅ = Cloth bag; T₆ = IRRI poly bag; JAES = Jute Agriculture Experimental Station (JAES), Manikgonj, KRS = Kishoregonj Regional Station (KRS), BJRI. Figures in parentheses indicate the transformed values. Data in column having common letter(s) do not differ significantly at 5% level of significance. NS = Not Significant.

at KRS and JAES, respectively, lowest black band (1.18%) and die back (1.24%) were recorded in the field by using seeds stored cloth bag at KRS. The highest total disease incidence (12.84%) at KRS was recorded by using seeds of plastic pot and the lowest disease incidence (6.35%) was observed at KRS by using seeds stored in tin pot (Table 2).

Effect of seeds stored in different types of containers on field emergence (germination), plant stand, plant height and base diameter in O-9897 at JAES and KRS, BJRI following line sowing method in the field

Different types of storage containers differed

significantly in respect of seed germination in O-9897 grown at JAES and KRS of BJRI (Table 3). The highest germination (61.17%) at KRS was recorded by using seeds of tin pot. The lowest seed germination (53.83%) at JAES was recorded by using seeds stored in cloth bag. The highest mean germination of seeds (59.59%) and lowest mean germination (54.75%) of two locations were recorded by using seeds that stored in tin pot and gunny bag lined with polythene, respectively. Increasing of storage time resulted decrease in moisture content, germination and viability. Similar results were reported by Bhattacharyya and Dutta (1972) and Khare et al. (1974).

The highest total number of plant/m² (31.73) and lowest plant/m² (15.77) were recorded by

using seeds stored in gunny bag lined with polythene at JAES and KRS, respectively. Mean total number of plant/m² was highest (23.75) and lowest (19.45) of both locations by using seeds of gunny bag lined with polythene and cloth bag, respectively.

The highest plant height (2.97 M) at JAES was recorded by using seeds stored in tin pot. The lowest plant height (2.65 M) at KRS was recorded by using seeds that are stored in tin pot. The highest mean plant height (2.84 M) and lowest mean plant height (2.75 M) of two locations was recorded by using seeds stored in IRRI poly bag and poly bag, respectively and they were statistically not significant.

Highest base diameter (15.70 mm) at JAES and

Table 3. Effect of seeds stored in different types of containers on field emergence (germination), plant stand, plant height and base diameter in O-9897 at JAES and KRS, BJRI following line sowing method in the field.

| Treatment | % Field emergence | | | Number of plant/m ² | | | Plant height (M) | | | Base diameter (mm) | | |
|-----------------------|---------------------|----------------------|---------------------|--------------------------------|--------------------|-------|------------------|------|------|---------------------|--------------------|-------|
| | JAES | KRS | Mean | JAES | KRS | Mean | JAES | KRS | Mean | JAES | KRS | Mean |
| T ₁ | 58.00 ^a | 61.17 ^a | 59.59 ^a | 26.60 | 20.53 ^b | 21.92 | 2.97 | 2.65 | 2.81 | 15.70 ^a | 14.45 ^b | 15.08 |
| T ₂ | 55.50 ^{ab} | 56.83 ^{bc} | 56.17 ^{ab} | 23.33 | 16.50 ^c | 19.92 | 2.87 | 2.67 | 2.77 | 15.34 ^a | 13.95 ^b | 14.65 |
| T ₃ | 57.67 ^a | 58.50 ^{abc} | 58.09 ^{ab} | 21.93 | 23.10 ^a | 22.52 | 2.76 | 2.73 | 2.75 | 15.46 ^a | 14.23 ^b | 14.85 |
| T ₄ | 54.50 ^{ab} | 55.00 ^c | 54.75 ^b | 31.73 | 15.77 ^c | 23.75 | 2.85 | 2.77 | 2.81 | 15.06 ^{ab} | 15.31 ^a | 15.19 |
| T ₅ | 53.83 ^b | 60.50 ^{ab} | 57.17 ^{ab} | 22.40 | 16.50 ^c | 19.45 | 2.75 | 2.76 | 2.76 | 15.03 ^{ab} | 13.76 ^b | 14.40 |
| T ₆ | 57.67 ^a | 59.33 ^{ab} | 58.50 ^{ab} | 23.33 | 17.23 ^c | 21.93 | 2.92 | 2.76 | 2.84 | 14.55 ^b | 14.35 ^b | 14.45 |
| Level of significance | 0.05 | 0.05 | 0.05 | NS | 0.05 | NS | NS | NS | NS | 0.05 | 0.05 | NS |

T₁ = Tin pot; T₂ = Plastic pot; T₃ = Poly bag; T₄ = Gunny bag lined with polythene; T₅ = Cloth bag; T₆ = IRRI poly bag; JAES = Jute Agriculture Experimental Station (JAES), Manikgonj, KRS = Kishoregonj Regional Station (KRS), BJRI. Data in column having common letter(s) do not differ significantly at 5% level of significance. NS = Not Significant.

lowest base diameter (13.76 mm) at KRS were recorded by using seeds that stored in tin pot and cloth bag, respectively. The highest mean base diameter (15.19 mm) and lowest mean base diameter (14.40 mm) of two locations were recorded in gunny bag lined with polythene and cloth bag storing seeds, respectively (Table 3).

Effect of seeds stored in different types of containers on fibre and stick yield per plant and hectare in O-9897 at JAES and KRS, BJRI following line sowing method in the field

The highest fibre yield/plant (13.33 gm) at JAES was recorded by using seeds that stored in plastic pot and IRRI poly bag and fibre yield/ha (3.16 ton) at KRS was recorded when seeds stored in gunny bag lined with polythene. The lowest fibre yield/plant (7.00 gm) and fibre yield/ha (1.39 ton) at KRS were recorded by using seeds stored in IRRI poly bag. The highest mean fibre yield/plant (10.75 gm) and fibre yield/ha (2.98 ton) of both locations were recorded by using seeds of gunny

bag lined with polythene. Highest stick yield/plant (24.83 gm) and stick yield/ha (6.14 ton) at JAES were recorded when seeds stored in tin pot and plastic pot, respectively. The lowest stick yield/plant (19.33 gm) and stick yield/ha (4.33 ton) at KRS were recorded by using seeds stored in gunny bag lined with polythene and poly bag, respectively. The highest mean stick yield/plant (24.67 gm) and stick yield/ha (5.91 ton) of both locations were recorded when seeds stored in IRRI poly bag and plastic pot, respectively (Table 4).

Effect of seeds stored in different types of containers on number of branch and pod per plant in O-9897 at JAES and KRS, BJRI following line sowing method in the field

The highest branch (3.67) at JAES was recorded by using seeds of tin pot and highest pod/plant (24.67) at JAES was recorded with seeds stored in plastic pot. The lowest branch (2.67) was recorded by using seeds stored in gunny bag

lined with polythene and IRRI poly bag storing seeds at KRS and JAES, respectively and pod/plant (17.67) at JAES was recorded by using seeds of gunny bag lined with polythene (Table 5). The highest mean branch (3.50) and pod/plant (22.34) of two locations were recorded by using seeds that stored in tin pot and plastic pot, respectively. The lowest mean branch (2.67) and pod/plant (17.90) of two locations were recorded by using seeds stored in IRRI poly bag and cloth bag, respectively.

Effect of seeds stored in different types of containers on seed yield per plant and per hectare in O-9897 at JAES and KRS, BJRI following line sowing method in the field

Different types of storage containers differed significantly in respect of seed yield in O-9897 grown at JAES and KRS of BJRI (Table 6). The highest seed yield/plant (5.20 gm) and seed yield/ha (388.12 kg) at KRS were recorded when seeds were stored in IRRI poly bag and tin pot,

Table 4. Effect of seeds stored in different types of containers on fibre and stick yield per plant and hectare in O-9897 at JAES and KRS, BJRI following line sowing method in the field.

| Treatment | Fibre yield (gm/plant) | | | Stick yield (gm/plant) | | | Fibre yield (t/ha) | | | Stick yield (t/ha) | | |
|-----------------------|------------------------|--------------------|---------------------|------------------------|--------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|
| | JAES | KRS | Mean | JAES | KRS | Mean | JAES | KRS | Mean | JAES | KRS | Mean |
| T ₁ | 10.00 ^b | 7.50 ^{cd} | 8.75 ^c | 24.83 ^{ab} | 23.33 ^a | 24.08 ^a | 2.80 ^{ab} | 3.16 ^a | 2.98 ^a | 6.14 ^a | 5.67 ^a | 5.91 ^a |
| T ₂ | 13.33 ^a | 8.00 ^c | 10.67 ^a | 21.50 ^{cd} | 19.50 ^c | 20.50 ^{bc} | 2.33 ^b | 2.02 ^{bc} | 2.18 ^b | 5.58 ^b | 5.18 ^{ab} | 5.38 ^b |
| T ₃ | 10.00 ^b | 9.00 ^b | 9.50 ^{bc} | 23.17 ^{bc} | 20.17 ^c | 21.67 ^b | 2.19 ^b | 2.57 ^b | 2.38 ^{ab} | 5.05 ^c | 4.33 ^b | 4.69 ^d |
| T ₄ | 10.00 ^b | 11.50 ^a | 10.75 ^a | 21.00 ^d | 19.33 ^c | 20.17 ^c | 3.08 ^a | 2.48 ^{bc} | 2.78 ^{ab} | 4.95 ^c | 5.14 ^{ab} | 5.05 ^c |
| T ₅ | 10.00 ^b | 7.50 ^{cd} | 8.75 ^c | 21.00 ^d | 22.16 ^b | 21.58 ^b | 3.08 ^a | 1.90 ^{cd} | 2.49 ^{ab} | 5.63 ^b | 4.63 ^b | 5.13 ^c |
| T ₆ | 13.33 ^a | 7.00 ^d | 10.17 ^{ab} | 25.67 ^a | 23.67 ^a | 24.67 ^a | 2.66 ^{ab} | 1.39 ^d | 2.03 ^b | 5.91 ^{ab} | 4.91 ^{ab} | 5.41 ^b |
| Level of significance | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 |

T₁ = Tin pot; T₂ = Plastic pot; T₃ = Poly bag; T₄ = Gunny bag lined with polythene; T₅ = Cloth bag; T₆ = IRRRI poly bag; JAES = Jute Agriculture Experimental Station (JAES), Manikgonj, KRS = Kishoregonj Regional Station (KRS), BJRI. Data in column having common letter(s) do not differ significantly at 5% level of significance.

Table 5. Effect of seeds stored in different types of containers on number of branch and pod per plant in O-9897 at JAES and KRS, BJRI following line sowing method in the field.

| Treatment | Number of branch/plant | | | Number of pod/plant | | |
|-----------------------|------------------------|------|------|---------------------|---------------------|---------------------|
| | JAES | KRS | Mean | JAES | KRS | Mean |
| T ₁ | 3.67 | 3.33 | 3.50 | 20.00 ^b | 19.40 ^{ab} | 19.70 ^b |
| T ₂ | 3.33 | 3.00 | 3.17 | 24.67 ^a | 20.00 ^a | 22.34 ^a |
| T ₃ | 3.67 | 3.27 | 3.47 | 19.00 ^{bc} | 20.70 ^a | 19.85 ^b |
| T ₄ | 3.00 | 2.67 | 2.84 | 17.67 ^c | 18.50 ^{bc} | 18.09 ^c |
| T ₅ | 3.00 | 3.00 | 3.00 | 18.00 ^c | 17.80 ^c | 17.90 ^c |
| T ₆ | 2.67 | 2.67 | 2.67 | 17.67 ^c | 19.50 ^{ab} | 18.59 ^{bc} |
| Level of significance | NS | NS | NS | 0.05 | 0.05 | 0.05 |

T₁ = Tin pot; T₂ = Plastic pot; T₃ = Poly bag; T₄ = Gunny bag lined with polythene; T₅ = Cloth bag; T₆ = IRRRI poly bag; JAES = Jute Agriculture Experimental Station (JAES), Manikgonj, KRS = Kishoregonj Regional Station (KRS), BJRI. Data in column having common letter(s) do not differ significantly at 5% level of significance. NS = Not Significant.

respectively. The lowest seed yield/plant (3.50 gm) and seed yield/ha (304.55 kg) were recorded by using seeds stored in gunny bag lined with polythene and poly bag at KRS and JAES, respectively. The highest mean seed yield/plant (4.78 gm) and seed yield/ha (368.44 kg) of both

locations were recorded by using seeds stored in tin pot (Table 6).

The reduction of seed yield, fibre yield and stick yield might be due to the diseases of jute (seedling blight, anthracnose, black band, stem rot, die back, mosaic, root knot and soft rot)

causing death of seedling, spread of diseases to standing crops and killing of even matured plants. The loss in yield and quality of fibre and seed yield due to major disease of jute has also been reported by others (Ahmed, 1966; Ahmed et al., 1980).

Table 6. Effect of seeds stored in different types of containers on seed yield per plant and per hectare in O-9897 at JAES and KRS, BJRI following line sowing method in the field.

| Treatment | Seed yield (gm/plant) | | | Seed yield (kg/ha) | | |
|-----------------------|-----------------------|---------------------|------|----------------------|----------------------|----------------------|
| | JAES | KRS | Mean | JAES | KRS | Mean |
| T ₁ | 4.56 ^a | 5.00 ^{ab} | 4.78 | 348.75 ^a | 388.12 ^a | 368.44 ^a |
| T ₂ | 4.00 ^{bc} | 4.00 ^{bc} | 4.00 | 314.34 ^{bc} | 345.62 ^{ab} | 329.98 ^{bc} |
| T ₃ | 3.67 ^c | 4.33 ^{abc} | 4.00 | 304.55 ^c | 334.55 ^{ab} | 319.55 ^c |
| T ₄ | 3.60 ^c | 3.50 ^c | 3.55 | 313.65 ^{bc} | 313.65 ^b | 313.65 ^c |
| T ₅ | 3.66 ^c | 4.00 ^{bc} | 3.83 | 334.25 ^{ab} | 324.65 ^b | 329.45 ^{bc} |
| T ₆ | 4.20 ^{ab} | 5.20 ^a | 4.70 | 337.56 ^{ab} | 355.12 ^{ab} | 346.34 ^{ab} |
| Level of significance | 0.05 | 0.05 | NS | 0.05 | 0.05 | 0.05 |

T₁ = Tin pot; T₂ = Plastic pot; T₃ = Poly bag; T₄ = Gunny bag lined with polythene; T₅ = Cloth bag; T₆ = IRRI poly bag; JAES = Jute Agriculture Experimental Station (JAES), Manikgonj, KRS = Kishoregonj Regional Station (KRS), BJRI. Data in column having common letter(s) do not differ significantly at 5% level of significance. NS = Not Significant.

Therefore, the following conclusion may be drawn for quality seed and fibre production from the findings of this study:

- Quality and maximum seed and fibre production depend upon storage containers, duration and environmental condition,
- Fibre and seed yield were found to decrease with the increase of seed borne infection of fungal pathogens.

So, the following recommendation may be drawn for quality seed and fibre production from the findings of this study:

- Quality of jute seeds can be maintained by storage in tin pot and proper moisture content (9.5%).

Conflict of Interest

The authors declare they have no conflict of interest.

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