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REGULAR ARTICLE

SEED QUALITY OF GREENGRAM STORED IN DIFFERENT STORAGE ENVIRONMENT

M.M. Alam, M.H. Ali, A.K.M.R. Amin, Mirza Hassanuzzaman*

Department of Agronomy, Sher-e-Bangla Agricultural University, Dhaka-1207, Bangladesh

SUMMARY

A laboratory experiment was conducted with mungbean seeds kept in three different containers. Three containers were tin pot, poly bag and jute bag and stored at room temperature and RH for three months (23 June-23 September) in the Laboratory of Agronomy Department, Sher-e- Bangla Agricultural University, Dhaka, Bangladesh to study their storage behavior, germination percentage and quality. The seed of jute bag came to the contact with air and their moisture contents was decreased from initial moisture content and remained near to their Equilibrium Moisture content (EMC), moisture content of the seeds of jute bag was found decreased from 7.50% to 16.70% within 6 weeks of storage. But moisture contents of seeds of tin pot and poly bag remained approximate constant throughout 7 weeks period. As tin pot and poly bag was more or less air tight so the seeds of these container could not come to the contact with ambient room air, resulting no significant change of their moisture content. Germination capacity of the seeds of tin pot was found decreased from 78% to 68% and 77% to 58% in the seeds of poly bag. Germination capacity of the seeds of jute bag was found decreased from 73% to 48%t in 5th week of storage. So, the germination capacity was also found a little bit higher than the seeds of other containers. Considering three different container, tin pot container has been proved much more safe and secured than jute bag or poly bag container.

Keywords: *Vigna radiata*, germination, moisture content, vigority, storage.

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*Corresponding Author, Email: mhzsauag@yahoo.com

1. Introduction

Mungbean (*Vigna radiata* L. Wilczek) plays an important role in the dietary pattern of Asian people. In Bangladesh it is principally cultivated for edible seeds which are high in protein for human consumption. Mungbean straw is also nutritious for live stock feed and its cultivation improves soil productivity [1]. Another important feature of mungbean is its short growth duration and well adaptation to diverse agro-climatic conditions of tropical and sub-tropical regions of the world. This feature of mungbean enables itself to easy fit in cereal based cropping system of Bangladesh.

The yield of legume however, is very low as compared to cereals [2]. Further, yield of legumes in farmers' field is usually less than 1 t ha^{-1} against the potential yield of 2 to 4 t ha^{-1} [3] suggesting a large yield gap. Such yield gap of legumes indicates a great opportunity to

increase the productivity of mungbean at farm level.

The total demand of seed is 932250 ton and supply is 1175262 ton which is only 12.61% of demand. In case of vegetable seed total demand is 2700 ton and supply is 791 ton which is 29.30% of the demand.

Environmental condition is also one of the most important factors for quality control both in production and storage level. Among the environmental factors the relative humidity and temperature are most important for storing seed [4]. Analysis of climatological data [5] indicates that the climate of Bangladesh is hot and humid during most of the part of the year. According to Justice and Bass [6] when in storage condition the moisture content of seed goes above 8-9% then the risk of insect, fungal & bacterial attack increases.

So, maintain the quality of seed it is desirable to maintain the moisture content and temperature of seed storage environment within a desired range. Accordingly the present study was undertaken to understand the effect of storage environment on seed quality and to determine the appropriate storage environment for the supplied seed.

2. Materials and Methods

The study was conducted from 23 June, 2009 to 31 August, 2009 at the laboratory of department of Agronomy, Sher-e-Bangla Agricultural University, Dhaka-1207, Bangladesh.The experimental material was bean seed which was stored at room temperature and relative humidity at three different storage container viz. tin container, poly bag and gunny bag. The seeds from different container were placed for germination test in sand medium. Then regular observation was done and data were taken on different parameters.

During the storage period Seeds samples were taken every fourthnightly from the containers for determination of change of moisture content (Dry basis), germination percentage and presence of insect activity.

Moisture content was determined by using Grain Moisture Machine, Model No.-303 RS. It was a lightweight machine, made by China. For determining moisture content, 10 reading of moisture content were counted (at room temperature) and then average of them.

Germination test was conducted by following sand dish method. In this method sand with field capacity in earthen pot. 400 seeds were taken randomly from the seed samples of each container. 100 seeds were placed on an earthen pot with 3 replications. The earthen pot with seed was incubated at room temperature. After 4 days of incubation germination percentage was recorded following ISTA rules.

In every week presence and number of insects were also observed in the stored mungbean seed. Numbers of insects were counted from 1 kg of seeds.

Reading of dry bulb and wet bulb temperature and relative humidity of inside the room and outside the room was recorded in 9 am and 5 pm. Maximum and minimum temperature were collected from Department of Agronomy, SAU.

3. Results and Discussion

During storage period moisture of mungbean seeds of three containers was determined and recorded (Table 1 and Fig. 1). First Moisture content was 7.40%, 7.78% and 7.50% of tin pot, poly bag and jute bag respectively. After two weeks the moisture content of seeds of tin pot, poly bag and jute bag was respectively 10.31, 10.30 and 11.50 percent.

Table 1. Moisture content of Mungbean seeds and the average temperature and relative humidity of room during storage

Storage Container	Fortnight of Storage					
	0	*1*	*2*	*3*	*4*	*5*
Poly bag	7.40	10.31	11.20	12.42	13.20	13.40
Tin	7.78	10.30	12.32	13.12	14.50	15.20
Gunny bag	7.50	11.50	12.81	14.41	15.30	16.70
Temperature (°C)	35.40	32.50	32.70	32.30	32.50	32.0
Relative humidity (%)	72.00	78.00	75.00	81.50	84.70	80.00

The seed of jute bag came to the contact with air and their moisture contents were increased from initial moisture content. Moisture content of the seeds of jute bag was found increased 7.50% to 16.70% within 5 fortnights of storage and moisture contents of seeds of tin pot and poly bag were increased from 7.40% to 13.40% and 7.78% to 15.20% throughout 5 fortnights period. Similar result was found by Delouche et al. (1973). As tin pot and poly bag was open for counting moisture percentage, then the seeds of these containers could come to the contact with ambient room air resulting significant change of their moisture content.

Fig. 1. Moisture content of mungbean seed during storage period

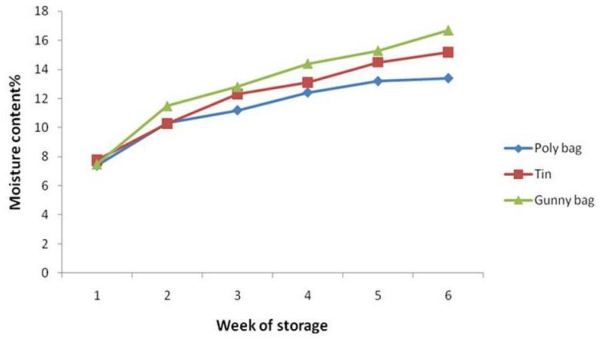
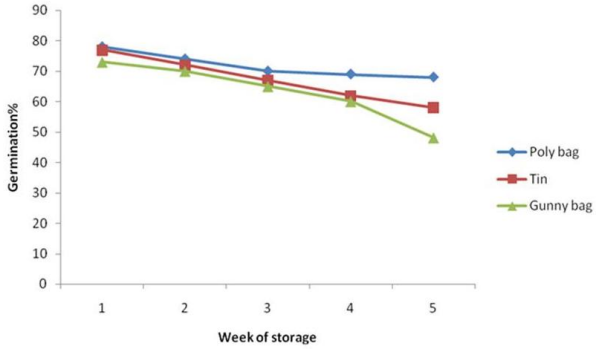


Table 2. Germination percentage of Mungbean seeds during the fortnights of testing

Storage Container	Fortnight of Storage				
	1	2	3	4	5
Poly bag	78	74	70	69	68
Tin	77	72	67	62	58
Gunny bag	73	70	65	60	48

Fig. 2. Germination percentage of mungbean seed during storage period



The germinability of mungbean seeds was found decreased with time of storage (Table 2 and Fig. 2). This decrease was closely related with the high moisture contents of the seeds. Seeds of jute bag and poly bag with high moisture content during storage period lost their germination capacity rapidly at a similar rate than tin pot the seeds of contained lower moisture content. Germination capacity of the seeds of jute bag was found decreased from 73% to 48% and 77% to 58% in the seeds of poly bag. Moisture content of the seeds of tin pot was found increased from 7.40 to 13.40 percent in 5 fortnights; it was less than other containers (Table 1). So the germination capacity was found higher than the seeds of other containers. It was found decrease followed by slowly decline in germination percentage of tin pot and germination decreased from 78% to 684% in 5 fortnights of storage.

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