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QUALITY ASSESSMENT OF VEGETABLES SEED IN RESPECT OF MOISTURE CONTENT AND GERMINATION PERCENTAGE COLLECTED FROM SYLHET AREA OF BANGLADESH

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ABSTRACT

The experiment pertaining to the present investigation was carried out in Sylhet Agricultural University (SAU), Sylhet. The experiment was conducted during the period from September 2018 to November 2018. Nine varieties of different vegetable were selected for conducting the experiment. The moisture content of the collected seed samples was determined with the help of electronic moisture meter before preserving the seed in seed storage. Germination was recorded twice at 4 and 8 days after sowing. Total germinated seeds, normal seedlings, abnormal seedlings and none- germinated seed were counted and expressed in percentage. The study revealed that the moisture content varied significantly from one to another, while minimum (7.90%) and maximum (11.90%) records were made in Lalmia (Lalshak) and Hero (Ridge gourd), respectively. In the case of germination of vegetable seeds of normal seedlings of different seed companies ranged from 56.00 to 70.00%. The highest percentage of normal seedlings was found 70.00% in variety Lima (Korola) collected from Metal Seed Limited and the lowest 56.00% in Green Finger (Okra) collected from ACI Seeds Bangladesh, respectively.

Keywords: Vegetable seed, quality, moisture content, germination.

Introduction

Seed is the most vital input that plays a key role in increasing the yield of the agricultural crop. Healthy or pathogen-free seeds are considered as the vital factor for the desired plant population and good harvest. Seeds of vegetables are more vulnerable to attack by pathogens and quickly deteriorate in storage. Quality seed means not only considered germination percentage, moisture, purity percentage but also the health of seed. Seed health, an essential component of seed quality is important for seed germination; seedling vigor and plant stand in the field and thereby crop/seed production. Their inherent quality cannot be assessed easily just from their external appearances. For a good crop, good seed is essential which indicates that the seed should be pure, viable and healthy. Use of good seeds can contribute to increasing vegetable yield as high as 30% remaining all other factors of production as content (Khanom, 2011). Vegetables are important for their low cost of production, short duration of production and high nutritive value. In 2013-2014 about 926 (‘000’) acres of land were under vegetable cultivation in Bangladesh and production was 3365 (‘000’) tons (BBS, 2014). However, the per capita consumption of vegetables in Bangladesh is only 55 gram which is far below from the daily requirement of 200 gram per head (Rashid, 1999). The lack of high-quality healthy seeds and the prevalence of seed-borne diseases are the main constraints for Bangladesh in maintaining the sustainability of vegetable crop production and per capita consumption. In Bangladesh considerable work has been done on seed health and seed quality of vegetable seeds by different researchers in the different regions. The health of seeds can be affected by direct infection of pathogens or through contamination of seeds by pathogenic propagules as contamination in, on or with the seeds or as concomitant contamination (Rashid *et al*., 2000). Use of healthy seeds may open a new era in desired vegetable production. One important environmental factor, with major effects on fungal activity, is water availability. Water potential is a measure of how much energy is required to extract water from a substrate. Total soil water potential is the sum of many components including matric, pressure, and gravitational potentials (Cook and Duniway, 1980). Moisture and temperature are the two factors which affect on germination of seed. Tariq *et al.*, (2005) reported that high moisture and temperature increase the infection of *A. flavus* and decrease the germination of soybean seed. Haque *et al.* (2007) revealed that seeds of trained farmers gave maximum germination (81.5%) and also yielded the maximum number of healthy

seedlings (76.6%). The seeds of untrained farmers had very low germination (62.2%), the highest number of diseased (6.8%), abnormal seedlings (6.75%) and lowest number of normal seedlings (48.6%). Thippeswamy *et al*. (2006) collected 145 brinjal seed samples were collected from different agro-climatic regions of Karnataka, India during 2001-03 and analyzed for mycroflora. This crop is susceptible to phomopsis blight and leaf spot. These diseases are seed-borne fungal disease and reduce germination and the yield up to 30-50 percent. However, information about the health and quality vegetables seeds of Bangladesh is rare. Keeping the above facts in consideration present work has been undertaken with the objective: to assure the quality of vegetable seeds used by farmers of Beanibazar upazila in Sylhet district.

Material and Methods

The experiment pertaining to the present investigation was carried out in Sylhet Agricultural University (SAU), Sylhet. The experiment was conducted during the period from September 2018 to November 2018. Nine varieties of different vegetable were selected for conducting the experiment (Table 1). The moisture content of the collected seed samples was determined with the help of electronic moisture meter before preserving the seed in seed storage. Germination was recorded twice at 4 and 8 days after sowing. Total germinated seeds, normal seedlings, abnormal seedlings and none-germinated seed were counted and expressed in percentage. The data collected from the experiments were analyzed for the test of significance and compared the treatment means by using Duncan's Multiple Range Test (DMRT) at 5% level of probability following the MSTAT-C program.

Table 1. Name of Vegetables, variety and their sources of collection

Sl. No.	Vegetables	Variety	Seed source
1	Cucumber	Folon-2	ACI Seeds Bangladesh
2	Okra	Green Finger	ACI Seeds Bangladesh
3	Lalshak	Lalmia	ACI Seeds Bangladesh
4	Korola	Tia	Lal Teer Seed limited
5	Ridge gourd	Hero	Lal Teer Seed limited
6	Korola	Lima	Metal Seed limited
7	Ridge gourd	Eureka	Metal Seed limited
8	Okra	Kissan	Syngenta Seed
9	Cucumber	Cute	Syngenta Seed

Results and Discussions

Moisture content

The moisture content of the collected vegetable seeds is presented in Table 2. The moisture content of the seed sample ranged from 7.90 to 11.90%, where the highest percentage (11.90%) of moisture content was found in variety Hero (Ridge gourd) and the lowest percentage (7.90%) in Lalmia (Lalshak). Significantly highest moisture content was found in seed samples collected from Lal Teer Seed Ltd. and the lowest in seed sample collected from Metal seed Ltd. Uddin (2005) determined the moisture content of farmers seeds of Begomgonj Upazila of Noakhali that ranged from 11.86 to 13.83%. Fakir *et al*. (2002) determined the moisture content of farmers seeds collected from Rajshahi, Bogra and Rangpur. They reported that moisture content of farmer’s seed of 2002 ranged from 7.0 to 13.9% varying with respect to crop season, farmers and locations of seed collection.

Germination

In the case of germination of vegetable seeds of normal seedlings of different seed companies ranged from 56.00 to 70.00%. The highest percentage of normal seedlings was found 70.00% in variety Lima (Korola) collected from Metal Seed Limited and the lowest 56.00% in Green Finger (Okra) collected from ACI Seeds Bangladesh, respectively. Abnormal seedlings of different seed companies ranged from 17.00 to

31.00%. Non germinated seed ranged from 7.00 to 18.00%. These results were varied from source to source and variety to variety. Islam *et al*. (2012) recorded seed germination decreased with increased seed infection regardless of the rice cultivars tested. A high negative significant correlation was obtained between all isolated fungi and seed germination in the laboratory for all seed samples tested, Aus rice cultivars (r= -0. 97) and Aman rice cultivars (r= - 0.90). Islam (2006) conducted an experiment to study the germination and health status of Indian spinach, Red amaranth and Spinach collected from BADC, Local Seed Company and Farmer. He observed nine fungi in Bottle gourd where seven fungi in Indian spinach, a fungus in Red amaranth and six fungi in Spinach. He also found, only *Fusarium moniliforme* was capable of transmitting a disease to grow seedlings. Adam *et al.* (2010) found that temperature during rice seed imbibitions influenced germination rate and final percent germination. Meanwhile, standard germination and tetrazolium chloride tests (TTC) were used to evaluate the percentage of seed viability and degree of dormancy. Fakir *et al.* (2003) conducted a detailed investigation to study the effect of different containers and additives on the quality of Boro rice seed. Germination, normal seedlings, abnormal seedlings, diseased seedlings and dead seeds which were ranged from 88.33 to 95.83%, 81.51 to 92.16%, 2.00 to 3.83%, 1.67 to 3.83% and 4.17 to 11.83%, respectively. Rahman *et al.* (2003a) conducted an experiment at Hobigonj district in Bangladesh and reported that germination of farmers stored rice seeds ranged from 71 to 78% varying with respect to containers and additive used. Rahman *et al.* (2003b) conducted the rice seed storage experiment with Boro rice seeds collected from 70 farm families of Puthia, Mohonpur and Durgapur Upazilla under Rajshahi district. Seed germination was ranged from 86.20 to 93.39%.

Table 2. Moisture content and germination test of vegetables seeds collected from different seed companies

Vegetables	Variety	Moisture content (%)	% Normal seedling	% Abnormal seedling	% Non-germinated seeds
Cucumber	Folon-2	9.60d	61.00c	30.00b	9.00e
Cucumber	Cute	8.30e	68.00ab	21.00cd	11.00d
Okra	Green Finger	10.90c	56.00d	31.00a	13.00d
Okra	Kissan	11.10bc	68.00ab	17.00e	15.00b
Lalshak	Lalmia	7.90f	63.00c	30.00b	7.00g
Korola	Tia	11.50b	67.00ab	19.00de	14.00c
Korola	Lima	8.20e	70.00a	22.00c	8.00f
Ridge gourd	Hero	11.90a	62.00c	20.00cd	18.00a
Ridge gourd	Eureka	11.00c	66.00b	18.00de	16.00b
Level of significance		**	**	**	**

There is a wide range for vegetable germination, which should be reduced and more trails in other areas are highly recommended.

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