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EVALUATION OF QUALITY STATUS OF SOME MAJOR VEGETABLE SEEDS USED BY FARMERS OF MYMENSINGH SADAR THANA

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ABSTRACT

The experiment pertaining to the present investigation was carried out in the laboratory of the Department of Seed Science and Technology, Bangladesh Agricultural University (BAU), Mymensingh. The experiment was conducted during the period from September, 2016 to November, 2016. Three vegetables and 3 varieties of each vegetable viz. Country bean (IPSA-1, BARI-4 and Noldog); Brinjal (Debgiri, Uttara and Singhnath) and Tomato (Raton, Ruma VF and Jalali) were selected for conducting the experiment. Seed samples were collected from different seed companies' viz. Ispahani Agro limited, Krishan Agro Service, Lal Teer Seed Company limited and Supreme Seed Company limited. Collected seed samples were categorized by dry inspection as apparently healthy seed 55 to 69%. It had been recorded that the collected seed samples contained discoloured seed (10 to 18%), shriveled seed (10 to 22%), other seed (0.00 to 4%) and inert matter (1.0 to 7.0%). The highest number of apparently healthy seed (69%) was recorded from variety Ruma VF (tomato) of Krishan Agro Service and the lowest (55%) from Noldog (country bean) collected from Supreme Seed Company limited. The highest percentage of pure seed was found in Noldog (country bean) 97% collected from Supreme Seed Company limited and the lowest in Ruma VF and Jalali (tomato) 91% collected from Krishan Agro Service.

Key words: Vegetable seeds, Seed Company, healthy seed, seed purity.

Introduction

In recent time Food Security, Poverty alleviation and Sustainable Agriculture became talk of the society, talk of the people and talk of the seminars. These topics are now addressed by Global leaders, Economists, Social reformers, Politicians and Civil Society. All these topics are aiming to one point that is-"Production of more food". To get more produce, good seed is the must and cannot be compromised under any circumstances (Anam, 2009). Among the Agricultural inputs, seed is the most vital input that play key role in increasing the yield of the crop. Healthy or pathogen free seeds are considered as the vital factor for desired plant population and good harvest. Seeds of vegetables are more vulnerable to attack by pathogens and quickly deteriorate in storage. 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 (Rahman *et al*., 2002). Infection of seed by pathogenic organism and presence of propagules of pathogen in a seed lot is vitally important because infected seeds/seed lot may fail to germinate, cause infection to seedlings and growing plants. For good crop, good seed is essential which indicates that the seed should be pure, viable and healthy (Khanom, 2011). The government of Bangladesh has considered the seed sector as high priority area. Although the seed system is at a very rudimentary stage, a total of 5 lakh tons of seeds including the seeds of cereals and other crops per year is required, out of which only 18% seeds are produced by different seed organizations with care but almost regardless of the health status. The rest 82% of the seeds retained by the farmers remain uncertified with unknown quality and outside the supervision of Seed Certification Agency (Fakir, 2000). Ten different types of fungi have been reported from 16 vegetable crop seeds collected from different shops of Mymensingh Sadar (Hossain and Purnima, 2011). In fact, this is actually an alarming situation in the country. The lack of high quality seeds and the prevalence of the seed borne organisms are the main constraints in maintaining the crop production (Fakir, 2000). Use of quality seeds can alone meet the loss. The lack of high quality healthy seeds and the prevalence of seed borne diseases are among the main constrains for Bangladesh in

maintaining the sustainability of vegetable crop production and per capita consumption. However, healthy or pathogen free seeds are considered as the vital factor for desired plant population and good harvest. In Bangladesh considerable work has been done on seed health and seed quality of rice seeds by different researchers in the different regions. Indeed, 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 following objective: i) to assess the quality status of some vegetable seeds used by farmers of Mymensingh sadar Thana and iii) to provide quality vegetable seeds to the farmers.

Materials and Methods

The experiment pertaining to the present investigation was carried out in the Seed Science and Technology Lab, Department of Seed Science and Technology, Bangladesh Agricultural University (BAU), Mymensingh. The experiment was conducted during the period from September, 2016 to November, 2016. Three vegetables and 3 varieties of each vegetable were selected for conducting the experiment (Table 1). Seed samples were collected from different seed companies' viz. Ispahani Agro limited, Krishan Agro Service, Lal Teer Seed Company limited and Supreme Seed Company limited.

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

Sl. No.	Vegetables	Variety	Seed source
1	Country bean	IPSA-1	Ispahani Agro limited
2	Do	BARI-4	Ispahani Agro limited
3	Do	Noldog	Supreme Seed Company limited
4	Brinjal	Debgiri	Krishan Agro Service
5	Do	Uttara	Lal Teer Seed Company limited
6	Do	Singhnath	Lal Teer Seed Company limited
7	Tomato	Raton	Supreme Seed Company limited
8	Do	Ruma VF	Krishan Agro Service
9	Do	Jalali	Krishan Agro Service

These varieties are usually used by the local farmers of Mymensingh sadar thana

Dry inspection of seed: For dry inspection in a clean laboratory table, the seeds of each working sample were separated and 70g seeds were randomly separated first, and then graded them into five categories. The categories were i) pure seed, ii) discoloured seeds, iii) shriveled seeds, iv) other seeds and v) inert matter.

Purity analysis of seed: From each sample, 70g seeds were taken following standard procedure for purity test (ISTA, 1996). Seeds were divided into three components viz. pure seed, other seeds and inert matter and expressed in percentage.

Statistical analysis: The data collected from the experiments were analyzed for 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.

Results and Discussion

Physical sorting of the Seeds by dry inspection method

The results of dry inspection of seeds of 9 cultivars of the collected vegetables seeds of different seed companies are presented in Table 2.

Healthy seed: The healthy seed in seed samples of different seed companies ranged from 55 to 69% which found to vary significantly from one source to another (Table 2). The highest number of apparently healthy seed was recorded in tomato seed sample collected from Krishan Agro Service (Ruma VF) and lowest in country bean seed sample collected from Supreme Seed Company limited (Noldog).

Table 2. Physical sorting of the Seeds by dry inspection method

Vegetables	Variety	% Healthy seed	% Discolor seed	% Shriveled seed	% other seed	% Inert matter
Country Bean	Noldog	55.00 e	18.00 a	20.00 b	3.00 b	4.00 c
	BARI-4	61.00 cd	16.00 bc	17.00 d	4.00 a	2.00 e
	IPSA-1	61.00 cd	17.00 ab	19.00 bc	2.00 c	1.00 f
Brinjal	Uttara	64.00 bc	10.00 e	20.00 b	3.00 b	3.00 d
	Singhnath	60.00 d	12.00 d	22.00 a	2.00 c	4.00 c
	Debgiri	64.00 bc	13.00 d	18.00 cd	2.00 c	3.00 d
Tomato	Jalali	63.00 bcd	13.00 d	18.00 cd	0.00 d	6.00 b
	Raton	65.00 b	15.00 c	11.00 e	2.00 c	7.00a
	Ruma VF	69.00 a	12.00 d	10.00 e	3.00 b	6.00 b
	$LSD_{0.05}$	3.26	1.05	1.08	0.260	0.639
	Level of significance	**	**	**	**	**
	CV (%)	3.05	4.38	3.66	6.53	9.33

Discolored seed: Percent discolored seed ranged from 10 to 18% which differed significantly as shown. Percent discolored seed was highest in country bean seed collected from Supreme Seed Company limited (Noldog) and lowest in brinjal seeds collected from Laal Teer Seed Company limited (Uttara).

Shriveled seed: Percent shriveled seeds ranged from 10 to 22% which differed significantly as shown (Table 2). Percent shriveled seed was highest in brinjal seed collected from Lal Teer Seed Company limited and lowest in tomato seeds collected from Krishan Agro Service, respectively. The highest (22%) shriveled seeds was found in variety Singhnath and the lowest (10%) in variety Ruma VF.

Other seed: Percent other seed ranged from 0.00 to 4% which differed significantly as shown (Table 2). Percent other seed was highest in country bean seed collected from Ispahani Agro limited and lowest in tomato seeds collected from Krishan Agro Service. Percent of other seeds varied from variety to variety where the highest percentage (4%) of other seed was found in variety BARI-4 and the lowest percentage (0.00%) in variety Jalali.

Inert matter: Percent inert matter of seed differed significantly and ranged from 1 to 7%. Percent inert matter of seeds was highest in tomato seed collected from Supreme Seed Company limited and lowest in country bean seeds also collected from Supreme Seed Company limited. The highest percentage (7%) of inert matter of seeds was found in variety Raton and the lowest percentage (1%) in variety IPSA-1.

Fakir *et al*. (2003) recorded wide variation of components among the collected seed samples of rice. Uddin (2005) studied the farmer seeds of Begumganj upazilla in Noakhali, and recorded apparently healthy seed (44.33 to 59.42%), spotted seed (27.84 to 44.77%), discolored seed (3.93 to 8.94%), partly filled seed (0.43 to 2.35%), deformed seed (0.91 to 3.98%), unfilled seed (0.001 to 0.68%), varietal mixture (0.26 to 2.22%), other plant parts (0.001 to 0.36%), inert matter (0.50 to 0.34%) and insect damaged seed (0.05 to 0.75%). Fakir *et al*. (2002) studied rice seed sample and recorded 91.20 to 98.89% pure seed, 3.72 to 37.71% spotted seed, 8.46- 15.50% deformed seed collected from Rajshahi, Rangpur and Bogra of Bangladesh.

Purity Analysis

Pure seeds: The percent pure seed of different seed companies ranged from 91.00 to 97.00% (Table 3), where the highest pure seed was recorded from the seed sample of Supreme Seed Company limited and lowest pure seed were recorded from the seed sample of Krishan Agro Service. In the respect of variety, the highest percentage (97.00%) of pure seed was in variety Noldog (country bean) and the lowest (91.00%) in variety Ruma VF and Jalali (tomato).

Other seeds: The percent of other seeds of different seed companies ranged from 0.00 to 4.00% as shown (Table 3) where the highest numbers of other seeds were recorded from the seed sample of Ispahani Agro limited and lowest numbers of other seeds were recorded from the seed sample of Supreme Seed Company limited. In respect of variety, highest percentage (4.00%) of other seeds was in variety BARI-4 and the lowest (0.00%) in variety Ratan of Tomato.

Table 3. Purity analysis of vegetables seeds collected from different seed companies

Sl. No.	Vegetables	Variety	Different components under purity analysis (%)		
			Pure Seed	Other seed	Inert matter
1	Country bean	IPSA-1	93.00	3.00	4.00
2	Do	BARI-4	94.00	4.00	2.00
3	Do	Noldog	97.00	2.00	1.00
4	Brinjal	Debgiri	94.00	3.00	3.00
5	Do	Uttara	94.00	2.00	4.00
6	Do	Singhnath	95.00	2.00	3.00
7	Tomato	Raton	94.00	0.00	6.00
8	Do	Ruma VF	91.00	2.00	7.00
9	Do	Jalali	91.00	3.00	6.00

Inert matter: The percent inert matter in seed samples of different seed companies ranged from 1.00 to 7.00% as shown in Table 3, where the highest number of inert matter were recorded in tomato seed sample of Krishan Agro Service and and lowest number of inert matter were recorded in country bean seed sample of Supreme Seed Company limited. In case of variety, highest inert matter (7.00%) was found in variety Ruma VF (tomato) and the lowest (1.00%) in variety Noldog.

In case of purity analysis of vegetables seeds of 9 varieties 91-97% pure seeds were observed. Inert matter was recorded ranged from 1.00 to 7.00%. These results were varied from source to source and variety to variety. Vig *et al.* (2001) conducted study on the quality of 15 rice seed samples which were collected from farmers in Gurdaspur, Punjab, India. Three samples were of low physical purity that ranged from 93 to 95%. Fakir *et al*. (2002) reported the percentage of pure seeds ranging from 91.20 to 98.89% that recorded in farmers stored rice seed.

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