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Effect of seed treatments on seed quality characters of paddy variety (Vishnu Bhog) during storage

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Abstract
A storage experiment was conducted to understand effect of seed treatments on seed quality characters of paddy variety (Vishnobhog) during storage at Seed Testing Laboratory, SHIATS Allahabad for 9 months during 2013-15. The paddy seeds were taken from the seed Processing unit SHIATS, Allahabad and were treated with Neem Oil (T_1) and Carbendazim 12% (T_2) and T_0 was kept as control (untreated).The initial moisture content of paddy seeds was kept 13% which is a standard. The data were recorded on characters *Viz:* germination percentage, root length, shoots length and on diseases percent after 9 months of storage. The effect of treatments on paddy seeds was significant on all characters after 9 months of storage. Mean comparison showed that the Carbendazim (T_2) recorded significantly higher germination percentage (88.21%) and root length (8.98 cm). The treatment Neem oil (T_1) recorded maximum shoot length (8.92 cm) and good health status after 9 months of storage as compared to control after 9 months of storage period. The results indicate that the seeds treated with treatment Carbendazim 12% (T_2) were good for all quality characters.

Key Words: paddy, germination, treatment, characters, storage

Introduction

Rice (*oryza sativa L.*) is the important major exportable food commodities with 9 per cent share in total agriculture in 1994-95 and raising to 22 per cent in recent years. Basmati like other rice varieties are gaining prime importance in export turnover more than 1000 million rupees. The availability of quality seeds decides the productivity and production and quality of the crop variety. Rice is by far the most important food crop in many developing countries, providing two-thirds of calorie intake of more than 3 billion people in Asia, and one-third of the calorie intake of nearly 1.5 billion people in Africa and Latin America (FAO, 2013). Approximately 11% of the world arable land is planted annually to rice (Chakravarthi and Naravaneni, 2006) [1].

Seed deterioration during storage is a gradual and inevitable process causing considerable losses. Seeds tend to lose viability and vigour during storage and information on storability of seed lots from harvest until the next planting season and also for carry over purposes is of immense importance in any seed production programme. Availability of good quality seed of parental lines is essential for any successful hybrid seed production. Seed mycoflora has been recognized as an important factor responsible for deterioration in quality of seeds during storage (Gupta and Aneja 2001) [5]. Seed storage is an essential segment of seed industry. In storage, viability and vigour of the seeds is regulated by many physico-chemical factors like moisture content of the seed, atmospheric humidity, temperature, initial seed quality, physical and chemical composition of seed, gaseous exchange, storage structure and packaging materials. As the seed is hygroscopic in nature, seed quality is affected by variation in moisture content, relative humidity and temperature. To combat these factors, it is better to store the seeds in moisture vapour proof containers like polythene bag, aluminium foil, tin or any sealed container to maintain the quality for longer period. Indiscriminate use of Chemical and their residual toxicity adversely affect the seed quality. Many of synthetic chemicals look effective but they are not readily degradable physically or biologically whichyield more toxic residues. Hence, the feasible approach is the treatment of seeds with botanicals which are safe, economical, eco-friendly, cheap, easily locally available and non-harmful to seeds, animals and human beings. It will be of immense use to the farming community. The higher seed yield and better quality seed can be produced by using organics and bio-fertilizers and how best scented rice seed can be stored by treating them with chemicals (halogens) or botanicals under ambient conditions with minimum qualitative and quantitative changes. The information on these aspects on scented rice is meager and not available.

Hence, the present study was taken up to study the effect of seed treatments on seed quality characters of paddy variety (Vishnobhog) during storage (Vishnobhog) during storage.

Materials and methods

Freshly harvested seeds of paddy variety (Vishnobhog) were obtained from Directorate of Seed and Farm, SHIATS Allahabad UP. And treated with fungicides Carbendazim 12% and biocide Neem oil respectively. The seeds were dried for time till their moisture content remains upto 12-13% for storage and packed in polythene bags and the seeds were stored for 9 months under ambient conditions. The data were recorded on characters *Viz:* germination percentage, root length, shoots length and on diseases percent after 9 months of storage.

Germination percentage

One hundred seeds in four replications were taken from each treatment and the germination test was conducted using between paper methods as per ISTA Rules. The rolled paper towels were placed in the germinator in slanting position at a constant temperature of 25+10C and 95+1 per cent relative humidity. The number of normal seedlings was counted at the end of 14th day of the test; the count of germination was expressed in percentage.

Root length

Final count was observed on 14th day after every storage interval (3 months upto 9 months) and 5 normal seedlings were selected randomly and measured the root length of them. The root length was measured from the tip of primary root to base of the hypocotyle and the mean root length was expressed in centimeters.

Shoot length (cm)

The same five normal seedlings selected randomly for measurement of root length were used to record the shoot length. The shoot length was measured from the base of primary leaf to the base of hypocotyle and the mean shoot length was expressed in centimeters.

Seed health

Detection and identification of seed mycroflora was done by the paper blotter method (top paper) as per ISTA (1996).

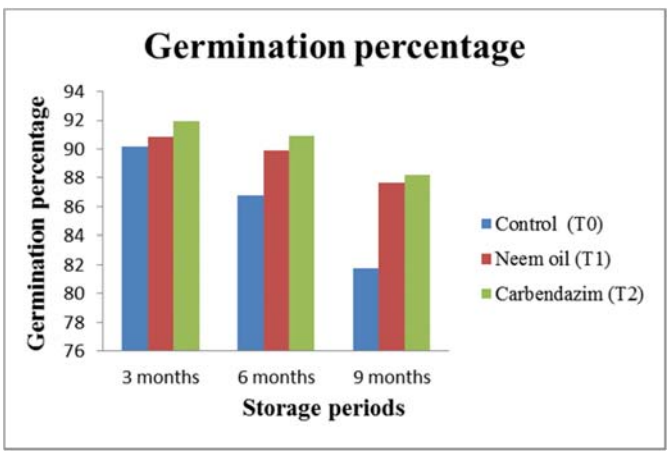
Statistical analysis. The analysis of variance was worked out to test the significant differences among seed treatments by F- test and critical difference between treatments and genotypes. Fisher and Yates (1936) [4].

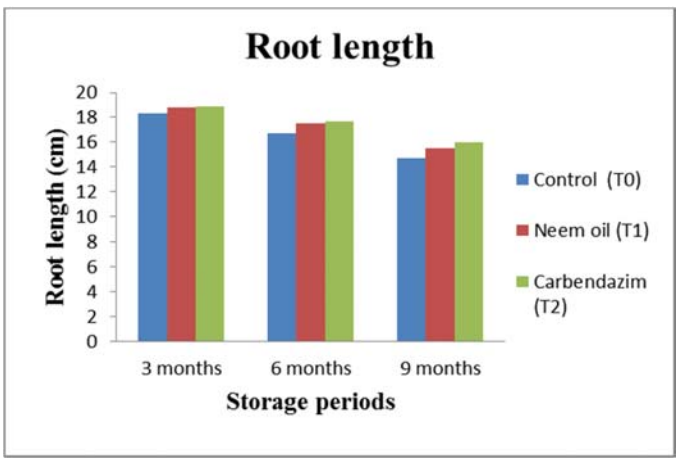
Result and Discussion

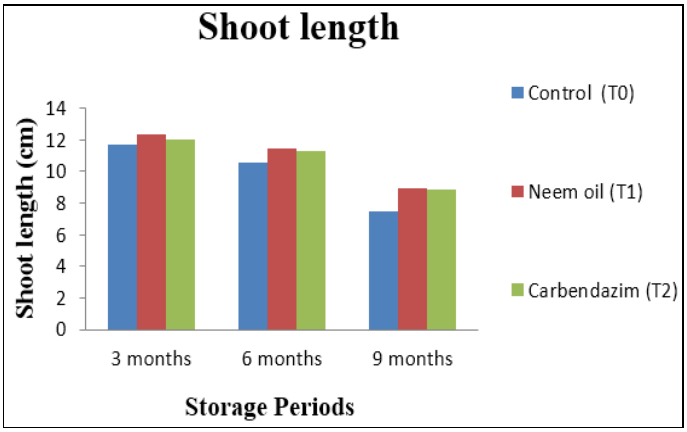
Viability and vigour of the seed varied from source to source as the locality factors influenced the storability of seed. The seeds from different sources possess different quality values, physical structures and chemical composition. These factors determine the longevity of seed in the storage. The seeds treated with Carbendazim (T_2) recorded significantly higher germination percentage (88.21%) and root length (8.98 cm). The treatment Neem oil (T_1) recorded maximum shoot length (8.92 cm) and good health status after 9 months of storage as compared to control after 9 months of storage period. This is in accordance with the findings of Singh *et al.*, (1996) [11]. In onion who have reported Carbendazim and bavistin as an effective fungicide against *Alternaria alternata*, *Rhizophus* spp, *Fusarium* spp and exhibited higher germination and vigour index in seeds of onion and other crop seeds. Similar results were made by Raju and Sivaprakasan (1994) [9]. In maize. Similar studies were made by other scientist using fungicides as protectants by Dhyani *et al* (1991) [2]. In chilli with captafol, thiram and vitavax, Reddy and Reddy (1994) [10]. In eggplant with thiram and delson and Ozer and Koycu (1998) [8]. In paddy with thiram seed treatment.

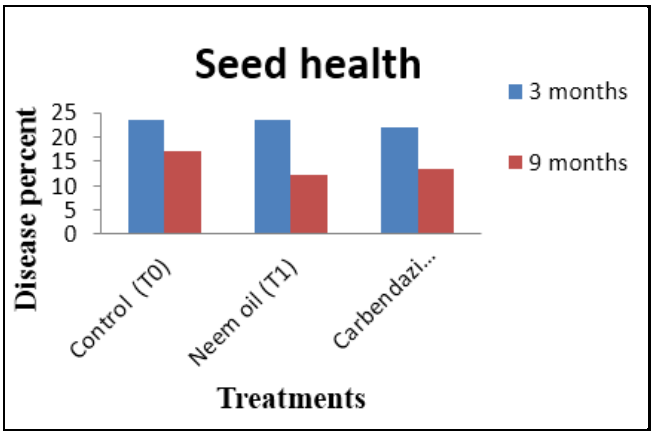
Seeds treated with carbendazim and neem oil recorded higher germination, rate of germination and vigour index might have played significant role in growth inhibition of storage fungi and attributed to higher germination, rate of germination and vigour index. This is in accordance with the findings of Raju and Sivaprakasan (1994) [9]. In rice and other cereals crops, Singh *et al* (1996) [11]. In onion. Similar observations were made by Kamble *et al.*, (1999) [7]. In cucumber, pumpkin, watermelon and muskmelon and Gupta and Dharmsingh (1990) [6]. In muskmelon and brinjal.

Treatments	Germination %			Root length (cm)			Shoot length (cm)			(Seed health)	
	3 months	6 months	9 months	3 months	6 months	9 months	3 months	6 months	9 months	3 months	9 months
Control (T_0)	90.17	86.79	81.75	18.33	16.68	14.68	11.73	10.58	7.45	23.55	17.01
Neem oil (T_1)	90.88	89.88	87.63	18.82	17.53	15.50	12.38	11.45	8.92	23.48	12.03
Carbendazim (T_2)	91.96	90.92	88.21	18.89	17.68	16.03	12.00	11.30	8.86	22.08	13.33
Mean	**91.003**	**89.196**	**85.8633**	**18.68**	**17.2966**	**15.4033**	**12.036**	**11.11**	**8.41**	**23.036**	**14.1233**
F- test	**S**	**S**	**S**	**NS**	**S**	**S**	**S**	**S**	**S**	**S**	**S**
S.Ed. (±)	0.30	0.33	0.33	0.26	0.26	0.26	0.23	0.23	0.17	0.25	0.25
C.D. at 5%	0.61	0.66	0.66	0.52	0.52	0.52	0.46	0.45	0.33	0.50	0.51









Conclusion

Based on the results of present study, it was found that the paddy seeds treated with fungicides and biocides showed better quality parameters even after 9 months of storage as compared to control. Seeds treated with Carbendazim of seed and neem oil were proved to be better for maintaining seed quality of paddy seeds for longer periods of storage. Seed treatments have a major role in protecting the seed during storage and can also play an important role in achieving uniform seedling emergence under certain conditions.

References

1. Chakravarthi, Naravaneni. SSR marker based DNA fingerprinting and diversity study in rice. Africa Journal of Biotechnology. 2006; 5(9):684-688.
2. Dhyani AP, Sati MC, Khulbe RD. Seed health testing of red pepper and bell peper with special reference to the pathogenesity and control of *Mycrothecium Verrucaria*. International Journal of Tropical Plant Diseases. 1991; 9:207-220.
3. FAO. (Food and Agricultural Organization). 2013. Report of Food and Agricultural Organization, 2013.
4. Fisher RA. The correlation between relatives on the supposition of Mendelian inheritance Tans. Royal Sco. Edinturgh, 1936; 52:399-432.
5. Gupta, Aneja. Mycofloral spectrum during storage and its effect on seed viability of soybean [*Glycine max* (L.) Merrill] seeds under ambient conditions. Proceedings of National Academy of Sciences, India 71 B III & IV. 2001; 245-253.
6. Gupta A, Dharamsingh. Viability of fungicide treated seeds of mungbean and cowpea in storage. Seed Research, 1990; 18:70-76.
7. Kamble P, Borikar GM, Patil, Kamble DV. Studies on seed borne pathogens of pumpkin, cucumber, watermelon and muskmelon. Journal of Soils and Crops. 1999; 9(2):234-238.
8. Ozer N, Koycu ND, Evaluation of seed treatments for controlling *Aspergillus, niger* and *Fusarium oxysporum* on onion seed. Phytopathological Mediterranea 1998; 37(1):33-40.
9. Raju UJ, Sivaprakasan K. Seed treatment of cabbage seeds by chemicals and non-chemical methods on the viability. Madras Agricultural Journal. 1994; 81:237-238.
10. Reddy SV. Reddy MB, Effect of seed protectants on storability of eggplant (*Solanum melongena L.)* seed. Seed Research, 1994; 22:181-183.
11. Singh B, Singh P, Vaish CP, Katiyar RP. Effect of various fungicides on viability of onion (*Allium cepa L.)* seed in storage. Seed Research, 1996; 24(1):61-63.