



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume2, Issue6)

Available online at: www.ijariit.com

Standardization (Phytotoxicity) of Germination Media (Paper) for Mustard Seedling Evaluation

Amol C. Vikhe

Seed Testing Division, Department of Quality Assurance,

Ajeet Seeds Pvt. Ltd, Chitegaon, Aurangabad.

amolvikhe54@gmail.com .

9860923652.

Abstract:-The standardization (Phytotoxicity) of germination media (Paper) is an important and essential aspect in seed industry (seed testing laboratory). The present work done on germination paper, which tested in our laboratory and showed good as well as bad results of germination papers. The germination papers accepted from consignee showed fluctuation in paper testing. We tested all the parameters regarding paper testing and also for germination testing. The paper sampled into 25 lots and tests were followed. Out of 25 lots seven lots failed to meet the standard parameter. The eighteen sampled lots meet to standard; hence the present study Revealed that to check the (Phytotoxicity) germination papers accepted from consignee before it use for germination.

Keywords: Germination paper, Phytotoxicity, Evaluation.

I. INTRODUCTION

Mustard (*Brassica* spp.), a native to temperate regions of Europe, was one of the first domesticated crops. This crop's economic value resulted in its wide dispersal and it has been grown as a herb in Asia, North Africa, and Europe for thousands of years. (E.S.Oplinger, E.A.Olke et.al ;) 1991. The oil crop plays an important role in our regular diet. The secured production of oil crop in Agriculture should be maintained from initial to final stage. The Mustard in vegetarian diet improves its quality characteristics and properties. Mustard is an annual crop belonging to family Brassicaceae and commercially cultivated in Gujarat, Rajasthan and Assam, Bihar, North-eastern States, Orissa, eastern Uttar Pradesh and West Bengal. In Haryana, Himachal Pradesh, Madhya Pradesh, Punjab, Uttaranchal and western Uttar Pradesh, it is grown as a catch crop during September- December.

India is the third largest rapeseed-mustard producer in the world after China and Canada with 12 per cent of world's total production (2006-07). Indian mustard (*Brassica juncea*) is predominantly cultivated in the states of Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat which contribute 81.5% area and 87.5% production (2001-02 to 2005-06). During 2006-07, more than 84 % of the total rapeseed-mustard acreage and production in the country is accounted for by these states, out of which more than 47.0% contributed by Rajasthan state alone. The crop takes 135-150 days to mature. (Arvind Kumar, O.P.Premi and Lijo Thomas),(2008).

II. MATERIALS AND METHODS

Materials

Sampled Germination paper lots.

Seed Sample of Mustard.

Germination Chamber.

Evaluation Board.

Methods

Germination

If there is a concern about seed quality, especially if it is seed that is over a year old, a wet paper towel germination test can be used to test the seed. A home germination test will provide a reliable estimate in lieu of an official test. Follow these steps to determine the viability and purity of seeds.

1. Obtain a representative sample of your seed.
2. Spread a paper towel on a flat surface and moisten with water until it is thoroughly damp. Do not dampen to point of run off or dripping. A plant mister or atomizer works well.
3. Place a total of 400 seeds in four Replications i.e.100 seeds in each replication (or other sample size) in rows on the towel. Make sure you randomly select seeds for your sample; do not cull any damaged, discolored or light seeds, since this will bias your germination test.
4. Moisten a second towel and carefully place onto the first paper towel, leaving the seeds sandwiched between the two towels.
5. Roll up the two towels with the seeds in-between and place in a sealed container that will retain the moisture. Place the container in an area of relatively stable temperature (22-25°C) &RH (65-70) unless otherwise instructed. Avoid areas where direct sunlight with its heating effect strikes the container.
6. Mark the container with the date and variety Lots of seed.
7. After the required germination period (3-4 days), remove the towels from the container and unwrap the seeds carefully so that the fragile shoots are not destroyed.
8. Count the seedlings that have shoots longer than 1½ inches (and at least one strong root) as viable seeds in the germination rate. Seedlings exhibiting short shoots and/or roots less than 1½ inches would probably not germinate soon enough in our cool soils to contribute significantly to the yield.
9. Determine the actual percent of germination. In this case it is the number of seeds exhibiting strong germination.
10. The seedlings categorized into Normal seedling, abnormal seedlings, Fresh ungerminated seeds, hard seeds, Dead seeds.

Formula-Total Number of Germinated Seeds /Total Number of Seeds Tested*100.

1. The reliability of your test is relative to the size of the sample tested, and several tests will the germination estimate.

III. EXPERIMENTAL RESULTS

Table-1- Showing the Seedling Categories of the sampled tested papers of eighteen lots.

Sr.No	Categories of Seedlings				
	Normal Seedlings	Abnormal Seedlings	Fresh Ungerminated Seeds	Hard Seeds	Dead Seeds
1	175	14	9	0	2
2	176	12	10	0	2
3	179	10	10	0	2
4	173	11	16	0	2
5	190	4	4	0	2
6	171	15	13	0	2
7	170	14	16	0	2
8	174	12	12	0	2
9	168	16	16	0	2
10	175	11	14	0	2
11	173	13	14	0	2
12	182	13	5	0	2
13	153	20	27	0	2
14	175	11	14	0	2
15	169	15	16	0	2
16	169	12	19	0	2
17	178	11	11	0	2
18	170	16	8	0	2
SD±	7.396	3.007	5.313	0	0
SE±	1.743	0.709	1.252	0	0

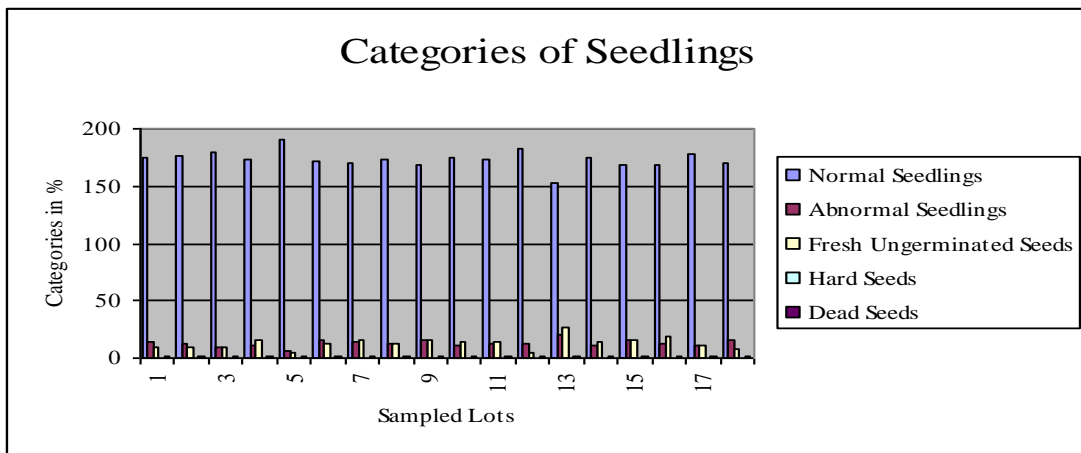
SD,SE Mean of four replications

Table-2- Showing the Seedling Categories of the sampled tested papers of seven lots.

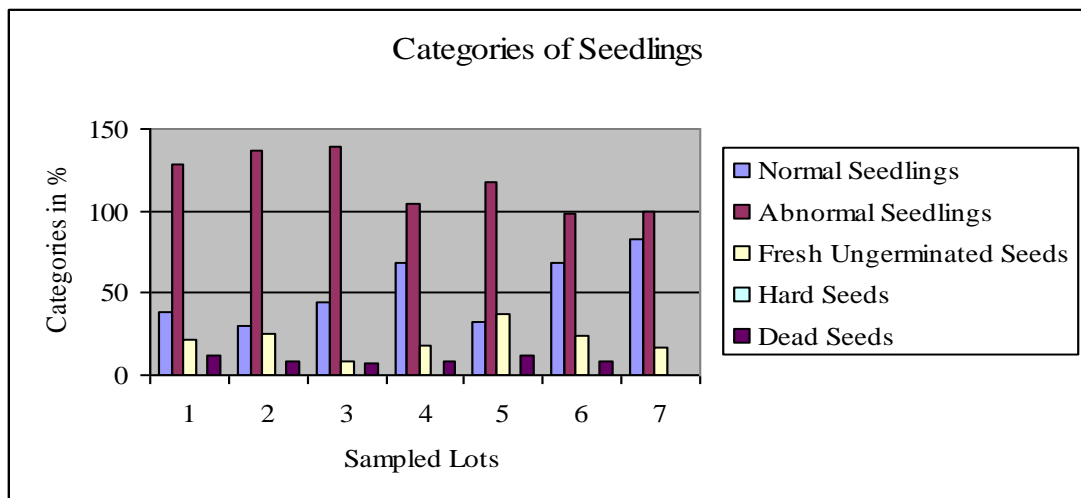
Sr.No	Categories of Seedlings				
	Normal Seedlings	Abnormal Seedlings	Fresh Ungerminated Seeds	Hard Seeds	Dead Seeds
1	38	128	22	0	12
2	30	137	25	0	8
3	45	139	9	0	7
4	68	105	18	0	9
5	33	118	37	0	12
6	68	99	24	0	9
7	83	100	17	0	0
SD±	5.345	17.107	8.635	0	4.059
SE±	2.02	6.467	3.264	0	1.534

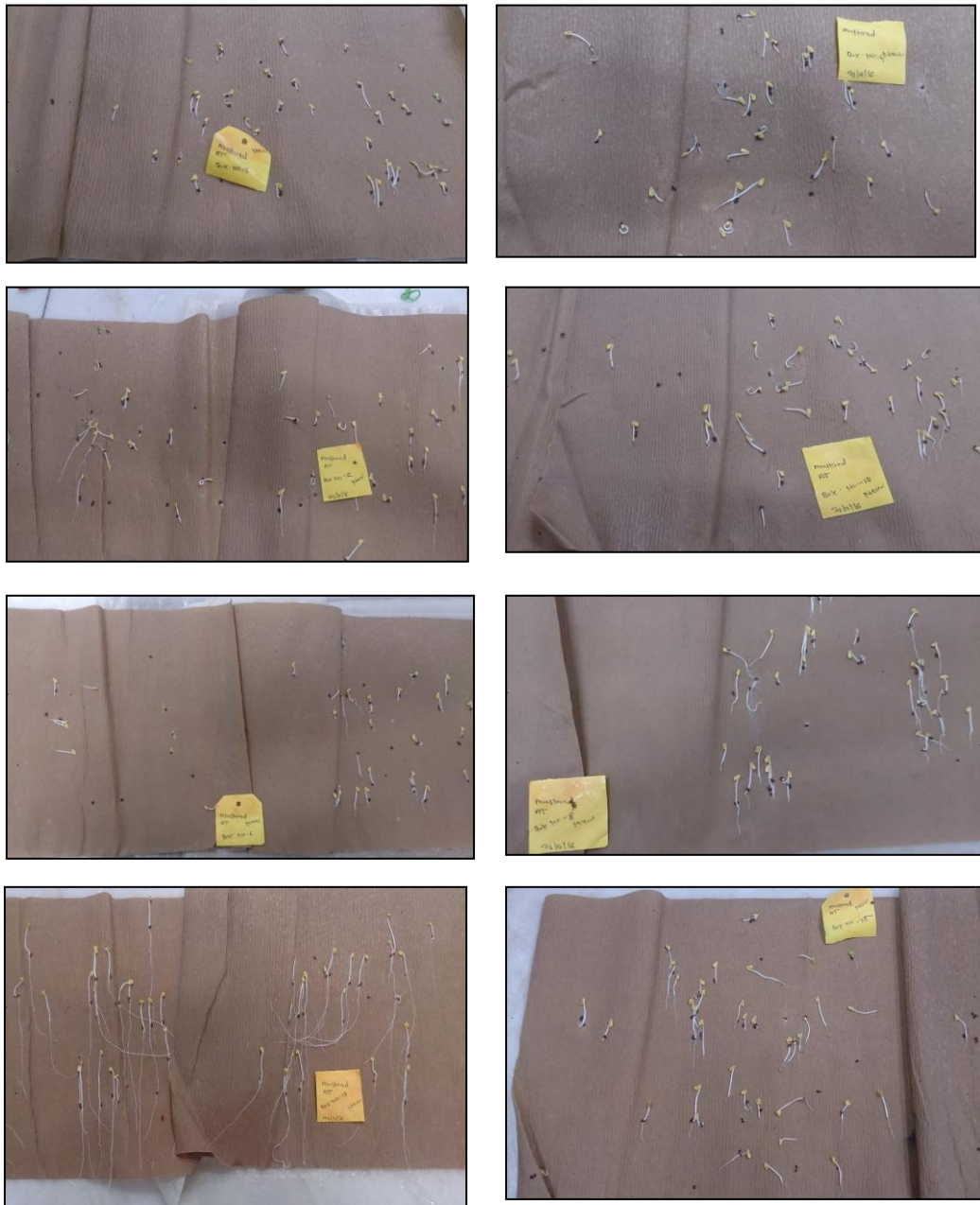
SD,SE Mean of four replications

Graph Table-1- Showing the Seedling Categories of the sampled tested papers of eighteen lots.



Graph Table-2- Showing the Seedling Categories of the sampled tested papers of seven lots.





IV. DISSCUSION

The tested sampled lots of given germination papers showed the fluctuation in the parameters regarding the paper testing. The seven lots said in results the germination percentage is lower as compared to eighteen lots. The seven lots showed the low frequency of normal seedlings and high frequency of abnormal seedling percentage than the eighteen lots which showed the high frequency of normal seedlings and low frequency of abnormal seedling.

The normal seedlings ranges from lower 30 to higher 83 out of 200 seeds in 2nd and 7th lot(Table-2). The abnormal seedlings highest in 3rd (139) and lower in 6th (99) out of 200 seeds (Table-2). The fresh ungerminated high (37) in 5th lot and low in 3rd (9)out of 200 seeds (Table-2). The dead seeds more than (Table-1) ranges from 7 to 12 in 3rd and 1,5th lot out of 200 seeds (Table-2).

The comparison with the Table-2, The Table-1 is most significant in the seedling categories. The highest normal seedlings showed by 5th lot(190)out of 200seeds.Its lower in 13th lot(153)out of 200seeds.The highest abnormality in 13th lot(20)out of 200seeds

and low in 5th lot((4)out of 200seeds.The dead seeds also ranges less than table-2,average about dead is 2 in each lot out of 200seeds.Fresh ungerminated maximum in 13th (27) and (4) in 5th lot out of 200seeds.

All above the two tables predicted that the effective emergence of normal seedlings not showed by table 2 of the same sample of the Given Mustard.

CONCLUSION

The present investigation showed the significant results to standardize the germination media (paper) and helpful and achieving best criteria for seed testing laboratory to check (Phytotoxicity) the germination papers during testing of seeds of various crops accepted from consignee to avoid or to overcome the problems regarding failing of seed lot percentage; which further losses in company economy and reputation and avoid effect on the production and research development sectors.

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