



Seedling vigor determination in different varieties of germinating wheat

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Abstract

The germinating Wheat is gaining a much-awaited popularity as targeted to nutrition food. At times and again the importance of germinating Wheat as unique food for correcting many health hazards related to weakness, fertility, cancer and many more is coming up as modern health food. Seedling vigor in germinating wheat is a critical factor in determining the crop's overall health and productivity. Seedling vigor is calculated by determining the percentage germination and length of seedling of the same seed lot. The whole data of eight varieties of wheat will be compiled in unsoaked seeds and in soaked seeds in different germinating systems. In the present studies the index of seedling vigor was found to be more vigorous in the variety Raj 3777 followed by Raj 3077, Raj 3765, GW173 and WH 147. These varieties showed very good effect in germination along with more vigor index.

Keywords: Germinating wheat, jwara, wheat grass, seedling vigor

Introduction

A small plant of Wheat is calling 'Jwara' or wheat grass or wheat germ consists of 70% chlorophyll. This is significant because chlorophyll resemblance in structure to haemoglobin. Haemoglobin is the important vital part in our blood. functionally, the haemoglobin carry oxygen to the different parts of our body; chlorophyll also have the same in structure to haemoglobin. Because of this chlorophyll is also know as "the blood of plants". The high level of chlorophyll found in wheatgrass. It can be easily absorbed by our bodies to rebuild the blood. The high chlorophyll content in germinating wheat is the powerful detoxifier which functions in cleansing the liver, cells, tissues and blood. Germinating wheat contains vit. A, vit.C, B complex vit. E and K. Vit.E is the important antioxidant, helpful in preventing the aging process of human body and also in preventing blood clots and strengthen the body's immunity. Germinating wheat contains 82 minerals out of 92 minerals present in soil including calcium, magnesium, iron, zinc, potassium, phosphorus and cobalt. Germinating wheat also have some important amino acids, which are the building blocks of the proteins found in human body. The high level of enzymes obtained in germinating wheat juice helps the metabolism of nutrients and in the repair and regeneration of cells and tissues of the body. It is a known fact that Wheat posses a great strength and it (provides strength to face diseases in our body) makes our immune system strong. Thus, it is very useful in our life. Doctor calls the extract of Jwara as "Nectar Juice" it protects our body from all types of diseases. Extract of Wheat Jwara possesses the quality of blood purification and it enhances the level of Hemoglobin. It has washes out foreign bodies and toxins from human body, which makes our body healthy.

Now days we have been suffering from different types of incurable diseases. Costly medicines leave side effects in the modern time. In such circumstances we will have to follow the path of nature. It is incontrovertible that naturopathy

keeps our body healthy without any side effects. Extract of Wheat Jwara is also a type of natural drink. Its use is highly beneficial. Its extract is highly beneficial in fatal disease such as cancer. It has rich nutritious value. Regular use of it strengthens our body and protects our body from ailments.

A lot of contents are found in the extracts of Wheat Jwara in natural form such as: active enzymes, minerals, fibers, Vitamins and Nutrients. By this reason extract of Wheat Jwara is called Natural Panacea. The present studies will be based on the improvement of the germinating Wheat along with seedling vigor. Seedling vigor in germinating wheat is a critical factor in determining the crop's overall health and productivity. Seedling vigor is calculated by determining the germination percentage and seedling length of the same seed lot. Hundred seeds each in three replications are germinated in various methods of crop species in germination test. While calculated the number of normal seedlings at the time of final result count, the seedling length of 5 random selected seedlings are also measured. Seed vigor index is calculated by multiplying germination (%) and seedling length (mm). The seeds showing the higher seed vigor index is considered to be more vigorous (Abdul Baki and Anderson, 1973) [2]. In this method the seed lot which have the highest vigor index is the most vigorous and the lowest vigor index have the less vigorous values, respectively.

Selection of the varieties

Seeds of the eight wheat varieties were procured from Rajasthan Seed Corporation and National Seed Corporation. The varieties selected for the studies are Raj 3765, Raj 3077, GW 173, PBW-343, HD 2687, Lok-1, WH-147, and Raj-3777.

These studies shall be evaluated and subsequently be standardized in all the systems in which germination percentage were calculated as in the presence of light. The whole data will be compiled as follows:

Seedling vigor observed in soaked seeds (24 hrs in water) in different germinating systems**Table 1:** Seedling vigor of the soaked seeds germinated in soil

S. No.	Varieties	Shoot Length	Root Length	Total Length	Fresh Wt.	Dry Wt	% Germination	Vigor Index
1.	Raj 3765	6.5	3.7	10.2	0.41	0.07	77%	7854
2.	Raj 3077	5.2	2.8	8.0	0.37	0.10	80%	6400
3.	GW 173	4.7	2.1	6.8	0.31	0.09	75%	5100
4.	PBW343	3.2	2.3	5.5	0.34	0.08	48%	2640
5.	HD 2687	3.1	2.5	5.6	0.31	0.07	52%	2912
6.	Lok-1	2.7	2.4	5.1	0.36	0.06	32%	1632
7.	WH 147	2.3	2.3	4.6	0.30	0.11	34%	1564
8.	Raj 3777	3.8	2.6	6.4	0.27	0.09	56%	3584

Var. Raj 3765 followed by Raj 3077 and GW 173 and Raj 3777 are more vigorous in the seeds germinated in soaked seeds in soil.

Table 2: Seedling vigor of the seeds germinated in cotton cloth

S. No.	Varieties	Shoot Length	Root Length	Total Length	Fresh Wt.	Dry Wt	% Germination	Vigor Index
1.	Raj 3765	2.4	2.5	4.9	0.15	0.04	80%	3920
2.	Raj 3077	2.5	2.4	4.9	0.14	0.04	86%	4214
3.	GW 173	2.5	2.2	4.6	0.13	0.03	72%	3312
4.	PBW343	1.0	1.9	2.9	0.10	0.04	78%	2262
5.	HD 2687	0.8	1.3	2.1	0.11	0.02	64%	1344
6.	Lok-1	0.9	1.2	2.1	0.15	0.04	69%	1449
7.	WH 147	0.11	1.1	2.2	0.12	0.03	78%	1716
8.	Raj 3777	0.7	1.3	2.0	0.14	0.03	98%	1960

The var. Raj 3077 followed by GW 173 and Raj 3765 are more vigorous in the seeds germinated in cotton cloth.

Table 3: Seedling vigor of the seeds germinated in paper towel

S. No.	Varieties	Shoot Length	Root Length	Total Length	Fresh Wt.	Dry Wt	% Germination	Vigor Index
1.	Raj 3765	4.3	7.4	11.7	0.47	0.09	85%	9945
2.	Raj 3077	3.4	7.2	10.6	0.22	0.08	87%	9222
3.	GW 173	4.4	8.4	12.8	0.42	0.09	98%	12544
4.	PBW343	3.3	6.2	9.5	0.31	0.12	78%	7410
5.	HD 2687	5.6	9.4	15.0	0.52	0.11	92%	13800
6.	Lok-1	5.4	10.4	15.8	0.28	0.08	96%	15168
7.	WH 147	5.3	9.8	15.1	0.27	0.11	98%	14798
8.	Raj 3777	5.4	10.3	15.7	0.41	0.13	98%	15386

The var. Raj 3777 followed by Lok-1, WH 147 and GW 173 are more vigorous in the seeds germinated in paper towel.

Table 4: Seedling vigor of the seeds germinated in river sand with RO water

S. No.	Varieties	Shoot Length	Root Length	Total Length	Fresh Wt.	Dry Wt	% Germination	Vigor Index
1.	Raj 3765	7.2	7.1	14.3	0.52	0.19	50%	7150
2.	Raj 3077	6.5	8.7	15.2	0.73	0.13	44%	6688
3.	GW 173	5.3	8.1	13.4	0.44	0.13	32%	4288
4.	PBW343	7.2	4.5	11.7	0.49	0.08	35%	4095
5.	HD 2687	5.5	3.2	8.7	0.43	0.16	19%	1653
6.	Lok-1	3.4	4.6	8.0	0.65	0.12	52%	4160
7.	WH 147	4.2	6.2	10.4	0.51	0.09	50%	5200
8.	Raj 3777	5.7	4.2	9.9	0.46	0.16	43%	4257

Var Raj 3765 followed by Raj 3077, WH 147 and GW 173 are more vigorous in the seeds germinated in river sand with ro water.

Table 5: Seedling vigor of the seeds germinated in saline water

S. No.	Varieties	Shoot Length	Root Length	Total Length	Fresh Wt.	Dry Wt	% Germination	Vigor Index
1.	Raj 3765	3.6	2.2	5.8	0.21	0.07	10%	580
2.	Raj 3077	2.5	2.1	4.6	0.20	0.06	11%	506
3.	GW 173	2.1	2.1	4.2	0.23	0.08	5%	210
4.	PBW343	2.8	2.3	5.1	0.31	0.07	31%	1581
5.	HD 2687	4.6	3.2	7.8	0.32	0.09	11%	858
6.	Lok-1	6.7	4.1	10.8	0.39	0.08	28%	3024
7.	WH 147	4.2	3.1	7.3	0.31	0.06	20%	1460
8.	Raj 3777	6.9	4.1	11.0	0.34	0.09	29%	3190

Seeds germinated in saline water the var. Raj 3777 followed by Lok-1 are more vigorous.

In the present studies the seedling vigor index was found to be more vigorous in the variety Raj 3777 followed by Raj 3077, Raj 3765, GW 173 and WH 147. These varieties

showed very good effect in germination along with more vigor index. Hashim and Lalma varieties have observed maximum shoot length by Khalil 2015 [5]. Pawar *et al* 2003

[8] observed improving vigor by different methods of germination. Tariq Shah *et al* 2017^[11] studied influence of pre-sowing seed treatments on germination and seedling vigor of wheat. The treatment in Seed priming and hardening treatments enhances seeds vigor by protecting structure of the plasma membrane against injury during stress environment (Junmin *et al* 2000)^[3]. Better vigor improvement by different methods of germination also observed by Manjunath and Dhanoji, 2011^[7]. Presoaking seeds with optimal concentration of phyto-hormones enhance their germination, growth was observed under stress condition by increasing nutrient reserves by Khan *et al* 2016^[6]. Increased seedling vigor by the application of IAA and gibberallic acid recorded by Shah 2007^[9]. Strader *et al* 2011^[10] observed Butyric acid may promote or inhibit seedling growth, Greater membrane integrity in treated seeds of wheat were reported by Kaya *et al* 2006^[4] and Afzal *et al* 2002^[1] in hybrid maize.

It is concluded from this study that all wheat varieties responded more positive response in different pre-sowing seed treatment. There is a close association between the germination and seedling vigor. The feasible basis by different methods of seed germination by different treatments is increased membrane repair and enzymatic activities.

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