

INFLUENCE OF SEED PRIMING WITH ORGANICS AND BOTANICALS ON SEED QUALITY PARAMETERS OF BOTTLE GOURD (*LANGENARIA SICERARIA* L.) VAR. NAVEEN-II"

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Abstract – Bottle gourd is a member of Cucurbitaceae family being rich in proteins, amino acids and minerals. Several biotic and abiotic factors were found as a constraint that limit the seed production. Hence, seed priming methods were employed to assess the effect on seed quality parameters of bottle gourd current experimentation is done with objectives of influence of seed priming with organic, botanical and chemical treatments on seedling quality parameters. Thirteen treatments in the present study comprised of priming with water, NaCl at 3%, Panchagavya at 3 and 5%, Bheejamruth 3 and 5%, Jeevamruth at 3 and 5%, 3 % curry leaf extract, 3% neem leaf extract, 3% moringa leaf extract and 3% tulsi leaf extract for the duration of 12 hrs. Irrespective of the treatment type and concentration, all the treatments were found to be significant with respect to seed quality parameters that were recorded. The treatment T₄- Panchagavya at 5% for 12 hrs found to be promising among all the treatments that were considered for the study.

INTRTODUCTION

Vegetables are considered as the protective supplements of the food due to surplus minerals, vitamins and essential amino acids (Gedam *et al.*, 2016). Cucurbitaceous family is a moderately large group of vegetable crops, cultivated extensively that consists of wide range of the vegetables *viz.*, cucumbers, melons, pumpkin, squashes and gourds (Bose *et al.*, 2019). Among gourds, bottle gourd (*Lagenaria siceraria* L.) is commonly grown in India on a large scale.

According to Pandey *et al.*, (2017) most promising invigoration technique for improving the rate and uniformity of plant stand is seed priming rather than seed pelleting, seed hardening and seed coating. Seed priming is imbibition of seeds in different solutions for a specified duration under controlled conditions, then drying back them to their original moisture content, so that radicle do not emerges (Parimala *et al.*, 2017).

Organic seed priming *viz.*, treatment with Panchagavya, Beejamrutha, Jeevamrutha and botanicals provides resistant to high temperature and low moisture especially in semi-arid tropics (Jandaik *et al.*, 2016). According to Balasubramaniyan *et al.*, (2019) panchagavya and bheejamruth at 1%, 2% and 5% on cucumber increased all the seed quality parameters to the control. Increasing concentration levels and duration which do not normally specify to the crop may reduce the seedling growth and thus the seed quality parameters (Kumar *et al.*, 2020).

Leaf extracts *viz.*, curry, neem, moringa and tulsi not only act as a source of nutrients and organic matter, but also increase size, biodiversity and activity of the microbial population in soil leaves (Premabatidevi *et al.*, 2018). Leaf extract from the neem seed has the wide utility in the seed priming for preventing the occurrence of the seed borne and soil borne diseases due to Azardiractin is the main pesticidal component.

MATERIALS AND METHODS

The present study was carried out at seed testing laboratory of the Department of Genetics and Plant Breeding, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj (U. P.). Experimentation was carried out in completely randomized design with four replications each carries 100 treated seeds were placed in the roll towel paper method. The germination room was maintained at 25 ± 2 °C temperature and 90 ± 5 % RH.

TREATMENTS

T0-Control, T1- Hydropriming, T2- NaCl at 3%, T3 and T4 -Panchagavya at 3% and 5%, T5 and T6-Bheejamrutha at 3% and 5%, T7 and T8-Jeevamrutha at 3% and 5%, T9- Moringa leaf extract, T10-neem leaf extract, T11-Tulsi leaf extract and T12-Curry leaf extract.

For preparation of 3% of NaCl can dissolve 3.0g of NaCl in 100 ml of distilled water.

Panchagavya is prepared of ingredients from cow, such as milk, urine, dung, curd and clarified butter were added to mud pot and these contents were stirred twice a day; both in the morning and evening up to fifteen days to form the fermented product "Panchagavya". To prepare 3% and 5% solution; 30 ml and 50 ml of Panchagavya will be taken in a beaker respectively and then 1000 ml of distilled water will be added after constant stirring.

Bheejamrutha is formed from 5 Kg of local cow dung placed in cloth; bound by tape and was submerged in 20 l of water for 12 hrs. 50g of slaked lime was dissolved in 20 l of water in separate container and kept stable for overnight. After 12 hrs, this bundle of cow dung was squeezed thrice, to form cow dung extract and a Kg of soil was dissolved in cow dung extract along with slitters of wild cow urine and lime water was added and mixed well to constitute Beejamruth. To prepare 3% and 5% solution; 30 ml and 50 ml Beejamruth solution will be placed in a beaker respectively then 1000 ml of distilled water will be added after constant stirring.

Jeevamrutha is prepared by 200 litres of water were taken in a barrel, 10 kg local cow dung, 10 litres of aged cow urine, 2 kg jaggery, 2 kg pulse flour and hand full of soil were added. Periodical stirring for at-least 48 hours forms Jeevamruth solution. To prepare 3% and 5% solution; 30 ml and

50 ml Jeevamruth solution will be placed in a beaker respectively then 1000 ml of distilled water will be added after constant stirring.

For the preparation of 3 % of botanicals *viz.*, neem leaf extract, curry leaf extract, tulsi leaf extract and moringa leaf extract; 30 g of respective powder was dissolved in 1000 ml to constitute 3% of solution.

After preparation of solution 400 bottle gourd seeds were soaked in the respected solutions for 12 hrs. then the seeds were dry at room temperature to regain original moisture.

RESULTS AND DISCUSSION

Table 1 shows that T₄ – Panchagavya at 5% for 12 hrs. shown maximum germination of 78.75 % and the untreated control recorded minimum of 71.75 %.

For seedling growth, the maximum root length, shoot length and seedling length of 5.75 cm, 13.74 cm and 19.49 cm respectively was recorded by T₄ – Panchagavya at 5% for 12 hrs. The Control T0 recorded lowest seedling length of 17.17 cm.

The treatment; T₄ – Panchagavya at 5% for 12 hrs. recorded the maximum seedling fresh weight of 2.86 g and the maximum dry weight of 0.203 g among the treatments and minimum fresh weight of 2.11 g was recorded with Hydropriming for 12 hrs. (T₂); minimum dry weight of 0.158 g was recorded with the untreated control.

The treatment T₄- Panchagavya at 5% for 12 hrs recorded the maximum seed vigour indices- i and ii of 1534.46 and 15.95 respectively; Treatment T0-Control recorded the same of 1231.46 and 11.30 respectively.

DISCUSSION

Based on the results, it is evident that application of panchagavya at 5% recorded the superior values for all the seed quality parameters that were recorded. Panchagavya being rich in growth regulators *viz.*, IAA,

Kinetin, GA₃ provides the nutritional balance to the seeds and reduces the number of abnormal seedlings Balasubramanian *et al.*, (2019). Priming with halogens, osmotic ants, beneficial microbes etc., enhances the seedling stability to with stand the adverse effects of environment Meena *et al.*, (2013). Hydro-priming and halo priming (NaCl at 3%) had not been so effective and its performance was near to that of untreated control. At par treatments, T₆ - Beejamurtha at 5% for 12 hrs. and T₈ -Jeevamrutha at

Table 4.1. Influence of seed priming with organics and botanicals on seed quality parameters of Bottle gourd (*Langenaria siceraria* L.).

S. No	Treatments	Germination (%)	Root length (cm)	Shoot length (cm)	Seedling length (cm)	Seedling fresh weight (g)	Seedling dry weight (g)	Seedling vigour index -i	Seedling vigour index -ii
01.	T0	71.75	4.63	12.53	17.17	2.22	0.158	1231.46	11.30
02.	T1	72.25	4.91	12.72	17.63	2.11	0.175	1273.47	12.65
03.	T2	72.75	4.61	12.67	17.27	2.22	0.173	1256.53	12.55
04.	T3	75.25	5.20	13.37	18.57	2.58	0.193	1396.89	14.49
05.	T4	78.75	5.75	13.74	19.49	2.86	0.203	1534.46	15.95
06.	T5	74.75	5.20	13.48	18.68	2.53	0.188	1396.25	14.03
07.	T6	75.25	5.60	13.24	18.84	2.39	0.198	1417.67	14.86
08.	T7	75.50	5.24	13.23	18.47	2.45	0.183	1394.20	13.78
09.	T8	76.75	5.48	13.39	18.87	2.62	0.185	1448.34	14.20
10.	T9	73.50	5.22	12.77	17.99	2.41	0.175	1322.19	12.87
11.	T10	74.25	5.03	12.99	18.02	2.46	0.183	1337.80	13.54
12.	T11	73.50	5.12	12.68	17.80	2.39	0.190	1308.22	13.96
13.	T ₁₂	73.50	5.07	13.13	18.20	2.29	0.183	1337.64	13.41
Grand Mean	74.44	5.16	13.07	18.23	2.43	0.183	1358.08	13.66	
F test	S	S	S	S	S	S	NS	S	
SE (M)	0.71	0.06	0.13	0.14	0.05	0.006	16.95	0.46	
C.D. at 5%	2.04	0.19	0.37	0.41	0.16	0.01	48.69	1.33	
C.V.	1.90	2.62	2.01	1.54	4.69	6.41	2.49	6.79	

5% for 12 hrs. were also found to be promising and can also be recommended for seed priming in bottle gourd.

CONCLUSION

The performance of thirteen treatments under study judged on the basis of positive results obtained indicated that priming significantly enhanced the seed quality parameters of bottle gourd. The treatment T₄- Panchagavya at 5% for 12 hrs found to be promising among all the treatments with maximum germination of 78.75%, vigour index-i of 1534.46 and vigour index-ii of 15.95 respectively.

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