

COMPARATIVE EFFECT OF ORGANICS AND BOTANICALS SEED PRIMING ON SEED QUALITY PARAMETERS OF PUMPKIN (*CUCURBITA MOSCHATA*)

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Abstract–The experiment were conducted to study the Comparative effect of organics and botanicals seed priming on seed quality parameters of pumpkin (*Cucurbita moschata*), during of 2020-2021 in the post – graduation experiment laboratory of seed science and technology at the Department of Genetics and Plant Breeding , Naini Agricultural Institute , Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad , Uttar Pradesh. The Pumpkin seeds were treated with soaked seed that is control, Hydro priming (soaked with distilled water for 12 hours), Organic priming (Cow urine, coconut water, Panchagavya, Beeja amrita), Botanical leaf extract (Neem leaf extract, moringa leaf extract) Soaked for 12 hours with different concentrations, on seed of pumpkin. Among all these different treatments are significant but the moringa leaf extract 25% got highest in all seed quality parameters and followed by Cow urine 6% and the lowest one is control.

INTRODUCTION

Pumpkin (*Cucurbita moschata*) is one of the most common important vegetable crops. Pumpkin origin is Mexico and largely cultivated in India, Africa, Latin America, southern Asia and United states. It belongs to the family Cucurbitaceae, In India Pumpkin is commonly named as Sitaphal, or kaddu. It is dicotyledonous. The worldwide production of pumpkin is 24.62 million metric tons from an area of 5, 10,0000ha in India. The pumpkin seeds are larger in size and it is 16 to 20mm long. The seeds are germinated into 5 to 7 days for sowing. It is warm season crop. Pumpkin seeds are having more micro nutrients. It has great source of Magnesium, Zinc and copper, protein and it also including omega – 6 fatty acids. Pumpkin seeds are dried, roasted and it contains 2% of water hand 49% of fat, Carbohydrates are having 7 to 10%, protein having 28 – 40%. The pumpkins are expressed on dry weight basis and it contains seed moisture it was

having 8.46%. Pumpkin provides number of nutrients, oils and minerals such as iron etc. Also it contains thiamin, vitamin B6; vitamin c and E. Pumpkin contain fatty acids present in oils such as oleic acid of 29%. Also it considers a large amount of fiber and it consumes so many benefits to human health. The multipurpose uses of pumpkins, their great diversity and adaptation to a wide range of environments indicate the potential of this crop. The most common product, popular in most African countries, is the cooked mature fruit. In Zambia the ripe fruit flesh is dried for longer preservation (Grubben and Chigumira Ngwerume, 2004). On the other hand, in southern Africa the leaves are widely consumed as a leading leafy vegetable during the rainy season. In Zambia, 40% of the households use pumpkin leaves as relish daily during the rainy season. In some parts of Zimbabwe, pumpkin leaves are the most popular leafy vegetable. In Cameroon and other parts of central and West Africa *Cucurbita moschata* sp. is mainly grown for the 182 ripe seeds.

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MATERIALS AND METHODS

The current study was carried out in 2021 at seed testing laboratory of Department of Genetics and Plant Breeding, Naini Agriculture Institute, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj (U.P.). The Pumpkin variety is Jaunpuri it was used for experiment with different organic seed treatments T_0 to T_{12} under control. The lab experiment was studied by using C.R.D (Complete Randomized Design) in between paper method and four replications and 13 treatments under laboratory condition with control, one hydro priming, four organic priming and two botanicals leaf extract. So, these all treatments are soaked for 12 hours with different concentrations. After that, the primed seeds were allowed to dry back to their original moisture content under shade to assess the seed quality parameters. The seed quality parameters include germination percentage, root length, shoot length, seedling length, seedling fresh weight, seedling dry weight, seed vigour index I, seed vigour index II.

Treatment details:

1. T_0 - control
2. T_1, T_2 - Panchagavya
3. T_3, T_4 - Cow urine
4. T_5, T_6 - Coconut water
5. T_7, T_8 - Beejamrutha
6. T_9, T_{10} - Neem leaf extract
7. T_{11}, T_{12} - Moringa leaf extract

Seed quality parameters were determined according to the standard procedures prescribed in the between paper method in germination cabinets with the application of standard temperature of 20-30°C for 5 to 10 days with 80% relative humidity (ISTA 2012). Quality parameters like germination percentage, seedling length (cm), dry weight (mg), vigour index are assessed. Lab experiment data. Analysis was done by one-way ANOVA carried out according to procedure of Completely Randomized Design (Fisher, 1970).

RESULTS AND DISCUSSION

According to the result, all study Characteristics were affected by the treatments and there was completely significant with soaked seeds. All seedling characters like Germination Percentage, Root length (cm), Shoot length (cm), Seedling length, seedling fresh weight(g), seedling dry weight(mg), Seed vigour index – I, Seed vigour index – II.

Germination (%)

Significantly it gives higher germination percentage (93cm) and it is reported in treatment of Moringa leaf extract (25%) and it was followed by (91cm) primed with Cow urine (6%). So, the lowest germination percentage was recorded by Control (81cm).

Root length

The Maximum Root length (26.20cm) were recorded by moringa leaf extract (25%) and it was followed by (23.79cm) primed with cow urine (6%). So, the Minimum root length was recorded by control (14.92cm).

Shoot length

The Maximum shoot length (18.66cm) recorded by Moringa leaf extract (25%) followed by (18.11cm) primed with cow urine (6%). The Minimum shoot length was recorded by control (13.45cm).

Seedling length

The Maximum Total Seedling length (44.86 cm) was recorded by moringa leaf extract (25%) followed by (41.91 cm) primed with cow urine (6%). The Lowest Total Seedling length was recorded by control (28.37 cm).

Seedling Fresh weight

The Maximum seedling fresh weight (1.51g) were recorded by moringa leaf extract (25%) followed by (1.32g) primed with cow urine (6%). The Lowest fresh weight of seedling was recorded by control (1.02g).

Seedling dry weight

The Maximum Dry weight of seedling (0.28mg) recorded by moringa leaf extract (25%) followed by (0.25mg) primed with cow urine (6%). The Lowest dry weight of seedling was recorded by control (0.06mg).

Seed Vigour Index – I

Maximum Seed vigour index I (4,173.27) recorded by moringa leaf extract (25%) followed by T_4 (3,811.96) primed with cow urine (6%). Minimum seed vigour index I was recorded by control (2,298.81).

Seed Vigour Index – II

The Maximum seed vigour index II (26.05) recorded by Moringa leaf extract (25%) followed by (23.2)

Mean Performance of Pumpkin for 8 Seedling Lab Characters

S.No	Treatments	Germination %	Root length (cm)	Shoot Length (cm)	Seedling Length (cm)	Fresh weight of seedling	Dry weight of seedling	Seed vigour index - I	Seed vigour index- II
1	T0	81	14.92*	13.45	28.37*	1.02	0.06	2,298.81	4.89*
2	T1	86.8	17.78*	16.15	33.93*	1.17*	0.15*	2,945.38	13.73*
3	T2	86.75	17.32	15.81*	33.13*	1.16*	0.14	2,874.14	12.17*
4	T3	87	18.17*	16.37*	34.55	1.19*	0.15	3,005.33	13.76*
5	T4	91	23.79*	18.11*	41.91	1.32*	0.25*	3,811.96	23.2
6	T5	85.75	16.78	14.66*	31.44*	1.14*	0.11	2,696.57	9.44
7	T6	86.55	16.96*	14.95	31.91*	1.17*	0.12	2,762.36	10.38*
8	T7	87.25	20.00*	16.98*	36.99	1.24*	0.18*	3,226.72	15.95*
9	T8	88.5	21.97*	17.81*	39.78*	1.26*	0.22*	3,521.35	19.70*
10	T9	83.8	15.92*	14	29.9*	1.09*	0.12*	2,506.59	10.28*
11	T10	85	16.17*	14.25	30.42*	1.12	0.11*	2,586.18	9.77*
12	T11	87.05	18.47*	16.57*	35.04*	1.21	0.17*	3,051.31	15.04*
13	T12	93	26.20*	18.66*	44.86*	1.51*	0.28	4,173.27	26.05*
	Grand Mean	86.88*	18.80*	15.98*	34.79*	1.20*	0.16*	3,035.38	14.18*
C.D (5%)		2.64*	1.27*	0.71*	1.50*	0.16*	0.03*	153.24*	3.52*
SE(m)		0.92	0.44*	0.24*	0.52*	0.05*	0.01*	53.37	1.22*
SE(d)		1.30*	0.62*	0.35*	0.74*	0.08*	0.01*	75.47*	1.73*
C.V.		2.11*	4.73*	3.09*	3.01*	9.78*	16.16	3.51*	17.32*
F test		S	S	S	S	S	S	S	S

primed with cow urine (6%). Minimum seed vigour index II was recorded by control (4.89).

SO, All the treatments has been reported that all primed seeds were showed better good germination percentage and higher in seed vigour quality parameters.

CONCLUSION

It is concluded from the present case study showed by using the different concentrations of priming treatments. The priming treatments were showed significantly effect on seed germination and seed quality parameters on seed of pumpkin. Priming with the best method is Moringa leaf extract (25%) increases the seed vigour quality parameters in pumpkin and it is also followed by cow urine (6%) in all priming method. So, Botanicals are showed the best result in comparison to organic priming.

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