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# Effect of seed pelleting using leaf extract on bhendi CV arka anamika

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**Abstract**
Field test was done at Elumathur in Erode district, Tamil Nadu, during (2019-2020) to examine the effect of seed pelleting the use of plant leaf powders on seed quality parameters of bhendi. Pelleting is one of the physical seed management strategies, in which individual seed are enriched with bio energetic substances at the seed surface to enhance the vigour of the seed. The seeds of bhendi have been given pelleting treatments viz., Neem leaf powder, Pungam leaf powder, Prosopis leaf powder, Notchi leaf powder and Fly ash and Termite soil are sown at the side of control. The results revealed that pungam leaf powder 200g/kg recorded the better values seed quality paramters, increase and yield parameters while compared to control.

**Keywords:** bhendi arka anamika, plant leaf powders, seed pelleting, seed yield

## Introduction
Bhendi [Abelmoschus esculentus (L.) Moench], belonging to family malvaceae, is a local of tropical africa. The crop is tremendously nutritious and considered as a source of treasured nutrients. It's also known as "an excellent villager's vegetable" because of its robust nature, nutritional fibres and wonderful seed protein, balanced in both lysine and tryptophan amino acids (Kumar et al., 2010) [4]. The immature fruits are used for consumption purpose at the same time as the dried seeds, roasted or grounded, are used as coffee additive or substitute. Furthermore, bhendi mucilage is appropriate for medicinal and commercial programs. It medicinally used as plasma replacement or blood quantity expander. The primary bhendi developing states in India are Uttar Pradesh, Andhra Pradesh, West Bengal, Bihar, Maharashtra and Karnataka. Seed pelleting is the procedure of enclosing a seed with small amount of inert material simply big enough to supply globular unit of widespread length to offer small quantity of nutrients to younger seedlings (Krishnasamy, 2003) [5]. This technique is acclaimed to play important role in modern-day agriculture for precision planting and additionally for supplementary nutrients via which uniform and vigourous subject standards viable. It reduces the trouble of thinning, gap filling and chemical compounds required (Manjunath et al., 2009) [7]. Similarly pelleting with natural leaf powders stated to enhance the water protecting potential of soil on the place of root formation and enhance the supply of nutrients to the germinating seed (Srimathi et al., 2013) [11].

## Materials and Methods
Genetical and physical pure seeds of bhendi variety cv. Arka anamika was obtained from palur research station had been imposed for seed pelleting treatments. The Field experiment were executed at elumathur in Erode district, Tamil nadu, for the duration of (2019-2020).Seeds had been pelleted with powders made from leaves of pungam, neem, notchi, prosopis, flyash, termite soil @ 200 g/ kg of seed, the usage of maida as adhesive @10% and dried in shade condition. $T_0$ - control (unpelleted), $T_1$ - Neem leaf powder @ 200 g /kg, $T_2$ - Prosopis leaf powder @ 200 g /kg, $T_3$ - Pungam leaf powder @ 200 g /kg, $T_4$ –Notchi leaf powder @ 200 g /kg, $T_5$ –Fly ash @ 200 g /kg, $T_6$ – Termite soil @ 200 g/kg.The treatments have been evaluated for seed quality parameters viz., germination (%), root length (cm), vigour index and dry matter production. The experiment became arranged in a randomized factorial layout with 3 replications. Seed had been considered germination while the radical changed into two times the length of the seed. Seed were evaluated for germination percentage germinability turned into recorded 15 days after sowing (DAS) and numbers of seed germinated expressed as percentage. At 7 DAS seedlings from each replication have been cautiously eliminated at random. Shoot length became measured from the collar vicinity to the tip of the longest leaf. Root period become measured from the base of the stem to the top of the longest root. The seedling vigor index became calculated the usage of the method of Abdul-baki and Anderson (1973). Information have been analyzed as per Panse and Sukhathme (1999) the use of the F-test to determine significance amongst treatments.

## Results and Discussion
In pelleting process, the seeds are stamped using an adhesive and are full of filler material are rolled in uniformity. The fulfillment of pelleting depends on the selection of filler fabric. Researchers expressed the

beneficiary impact of various filler fabric which includes leaf powder, fly ash and termite soil (Khatun et al., 2011) and mixture of a lot of these for acquiring progressed planting value. Within the gift research,bhendi seeds were pelleted with pungam leaf powder (200g/kg of seed) recorded higher values for seed first-class parameters viz., germination percentage (93.64%), speed of germination (27.57), shoot length (12.53cm), root length (8.73 cm) and seedling length (18.63 cm).The reason for better germination of pungam leaf pelleted seed can be extra hydration of colloids and higher viscosity of protoplasm and cellular membrane that permits the early front moisture that activates the early hydrolysis of reserve meals substances within the seed in comparison to govern. The higher germination may be due to the function of calcium as an enzyme cofactor in germination process by increasing protein synthesis. Comparable findings have been said Prakash et al. (2018).

The expanded shoot length (12.53 cm) and root length (8.73 cm) in seeds treated with pungam leaf powder can be attributed to cellular wall extension and increased metabolic sports. Besides this the bio content of pungam leaf powder may synergistically engage with amino acids especially tryotophan to shape the indole acetic acid (IAA) in germinating seeds to result in enhancement in seedling growth.Similar findings were made via Maheswari (1996), Afzal et al. (2002), Ramesh kumar and Muthukrishnan (2015) , Anbarasan et al. (2016) and Prakash et al. (2018).The suggested increase in seedling length (18.63 cm) and dry matter production (0.68 g) of pungam pelleted seeds perhaps due to activation of the growth selling materials and translocations of secondary metabolites to the growing seedling.

Seeds pelleted with pungam leaf powder are exhibited higher value for vigour index I and vigor index II. This will be due to the presence of physiologically active substance may additionally have activates the embryo and different associated systems which results in absorption of extra water due to cell wall elasticity and improvement of stronger and efficient root device which results in will increase in power index. Comparable studies were made by Prakash et al. (2018) in black gram.

The bhendi seeds were treated with pungam leaf powder (200g/kg of seed) showed higher values for growth parameters like area emergence (21.42 %), lower values for days to 50 % flowering (43.85), No of branches/plant (8.56) and plant height (67.21 cm) than control. Plant height is taken into consideration as one the important criterion for a crop in offering greater places for flower manufacturing main to better yield. Extended degree of growth parameters can be because of the precipitated effect of bio synthesis of nucleic acid, protein and hydrolytic enzymes it consequently stronger the cellular department, mobile growth and metabolic activity leads to growth plant growth development which ends up in elevated plant height and extra wide variety of branches. The critical in subject emergence will be attributes to activation of cells which ended in enhancement of mitochondrial hobby leading to the formation of extra excessive electricity compounds made to be had in early phase of germination. These findings are in concordance with consequences of Dileepkumar et al. (2009) [2], Anandhi et al. (2015) and Prakash et al. (2018). All of the studied yield parameters have been determined in higher inside the seeds pelleted with pungam leaf powder (200g/kg of seed) while compared to all different treatments and control. The pungam leaf pelleted seeds recorded maximum fruit length (17.32 cm), fruit weight (32.45 g), No of fruits/ plants (12.21), No of seeds/fruits (74.44) and 100 seed weight (6.12 g) lowest values have been noted in control. Increased in wide variety of culmination can be due to the physiologically lively substances might have activated the embryo and other related systems which resulted inside the absorption of extra water due to mobile wall elasticity and improvement of more potent and efficient root device which in flip favored derivation of extra nutrients permitting higher increase ensuing in higher yield. Similar findings were stated by Dileepkumar et al. (2009) [2] and Prakash et al. (2018).The increase in quantity of seeds can be due to accelerated pollen manufacturing and superior fertilization. The leaves of pungam contain 1.16% nitrogen, 0.14 % phosphorus and 0.49 % potash and numerous alkaloids like pinnalin, pongamol, saponin, β – sitosterol and tannins improved the nutritional absorption. Expanded yield and 100 seed weight can be due to the presence of auxin like substance within the pungam leaf powder regulates the growth and multiplied yield. These effects are on with findings of Manisathya and Muthuchelian et al. (2010) [6], Shehzad et al. (2012) [10] and Prakash et al. (2018).

**Table 1:** Effect of seed pelleting treatment on seed quality characters in bhendi cv. Arka anamika

| Treatment (T) | Germination (%) | Speed of germinaton | Shoot length (cm) | Root length (cm) | Seedling length (cm) | Fresh weight (g) | Dry matter production (g seedling$^{-10}$) | Vigour index I | Vigour index II |
|---|---|---|---|---|---|---|---|---|---|
| $T_0$ | 70.67 (57.217) | 20.64 | 3.233 | 3.15 | 6.36 | 1.25 | 0.15 | 201.91 | 14.07 |
| $T_1$ | 76.75 (61.186) | 23.35 | 6.310 | 4.74 | 10.74 | 2.31 | 0.33 | 718.45 | 26.44 |
| $T_2$ | 86.52 (68.704) | 25.23 | 9.14 | 6.42 | 14.51 | 3.18 | 0.52 | 587.92 | 41.56 |
| $T_3$ | 93.64 (59.004) | 27.57 | 12.53 | 8.73 | 18.63 | 3.96 | 0.68 | 975.33 | 56.72 |
| $T_4$ | 73.41 (58.961) | 21.86 | 5.04 | 4.03 | 8.15 | 1.82 | 0.24 | 459.28 | 20.18 |
| $T_5$ | 89.33 (71.003) | 26.12 | 10.66 | 7.06 | 16.82 | 3.54 | 0.60 | 846.89 | 47.35 |
| $T_6$ | 81.26 (64.460) | 24.46 | 7.81 | 5.38 | 12.37 | 2.83 | 0.41 | 330.64 | 32.83 |
| Mean | 81.65 | 24.17 | 7.82 | 5.64 | 12.51 | 2.69 | 0.42 | 588.63 | 34.16 |
| SED | 4.11 | 0.26 | 0.15 | 0.29 | 0.33 | 0.16 | 0.031 | 61.94 | 2.69 |
| CD(P=0.05) | 2.74 | 0.53 | 0.318 | 0.59 | 0.67 | 0.34 | 0.064 | 125.74 | 5.47 |

**Table 2:** Effect of seed pelleting treatment on plant growth characters in bhendi variety Arka Anamika

| Treatment (T) | Field emergence (%) | 50 % flowering | No of branches | Plant height (cm) |
|---|---|---|---|---|
| $T_0$ | 10.43 | 50.37 | 3.81 | 47.80 |
| $T_1$ | 13.61 | 46.05 | 4.87 | 55.43 |
| $T_2$ | 17.31 | 48.81 | 6.49 | 61.56 |
| $T_3$ | 21.42 | 43.85 | 8.56 | 67.21 |
| $T_4$ | 11.69 | 44.99 | 5.87 | 51.04 |
| $T_5$ | 19.53 | 49.62 | 7.21 | 64.47 |
| $T_6$ | 15.76 | 47.68 | 5.27 | 58.22 |
| MEAN | 15.67 | 47.33 | 6.01 | 57.96 |
| SED | 0.44 | 0.36 | 0.07 | 1.53 |
| CD(P=0.05) | 0.91 | 0.74 | 0.16 | 3.12 |

**Table 3:** Effect of seed pelleting treatment on plant yield characters in bhendi variety Arka Anamika

| Treatment (T) | Fruit length (cm) | Fruit weight (g) | No of fruits / plants | No of seeds / fruits | 100 g seed weight |
|---|---|---|---|---|---|
| $T_0$ | 11.24 | 14.09 | 3.00 | 35.08 | 4.21 |
| $T_1$ | 13.65 | 19.52 | 6.010 | 50.83 | 4.93 |
| $T_2$ | 15.67 | 25.68 | 9.13 | 58.74 | 5.53 |
| $T_3$ | 17.32 | 32.45 | 12.21 | 74.44 | 6.12 |
| $T_4$ | 12.57 | 16.74 | 4.41 | 48.78 | 4.62 |
| $T_5$ | 16.40 | 29.37 | 10.61 | 62.60 | 5.83 |
| $T_6$ | 14.51 | 22.81 | 7.43 | 56.66 | 5.25 |
| MEAN | 14.48 | 22.95 | 7.54 | 55.30 | 5.21 |
| SED | 0.19 | 1.05 | 0.68 | 0.76 | 0.12 |
| CD(P=0.05) | 0.39 | 2.14 | 1.40 | 1.55 | 0.25 |

## Conclusion

The discovered pelleted seeds had advanced photosynthetic performance of the plant and additionally enhance the nodulation which can be critical for greater productiveness. Pungam leaf powder are noticeably appropriate for seed pelleting as filler material in pelleting andhas proved to have invigourative impact on seed first-rate characters, increase and yield characters that changed into sustained at subject. Use of chemical substances as pelleting substances are pricey and causes natural threat, wherein as botanicals are much less pricey, without problems to be had to the farmers, secure to address and they are able to put together without problems. But the gift effects found out that seeds pelleted with pungam leaf powder better than unpelleted seeds and were observed with the aid of fly ash powder.

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