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Effect of different pre-sowing treatments on shoot growth of custard apple (*Annona squamosa* L.)

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Abstract
The study conducted to know the Effect of different pre-sowing treatments on shoot growth of custard apple (*Annona squamosa* L.) was carried out at Instructional-cum Research Farm, Department of Horticulture, College of Agriculture, Badnapur. during the year 2015-2016. The experiment was laid out in Randomized Block Design with eight treatments replicated thrice, comprising eight treatments of KNO_3 (0.1%), urea (0.1%), hot water, cold water, thiourea (1%), cow urine (10%), cow dung slurry (10%), GA_3 400 ppm for 24 hrs. The results of the investigation revealed that, there were significant variations seedling growth of custard apple due to pre-sowing treatments. Amongst the different treatments, the seed soaked in GA_3 400 ppm solution for 24 hours prior to sowing resulted in maximum stem diameter (0.16, 0.18 and 0.32 mm), maximum height (8.77, 13.40 and 19.57 cm), maximum leaf area (4.39, 18.50 and 31.82 cm^2) at 30, 60 and 90 DAS respectively, maximum fresh weight of seedling (3.56 g) and maximum dry weight of seedling (0.82 g) was obsereved under treatment T_8 i.e GA_3 400 ppm for 24 hrs, However the maximum no. of leaves (12.67) was obsereved at 90 DAS in treatment T_5 i.e thiourea (1%) for 24 hours. The present investigation concluded that the better seed growth of custard apple seedling was observed in treatment T_8 i.e GA_3 400 ppm for 24 hours is desirable.

Keywords: Seed, custard apple, annona squamosa, pre-sowing treatments, seed germination, growth

Introduction
The edible fruits of genus *Annona* are collectively known as annonaceous fruits. There are an estimated 2200 species of annonaceae in the world. These include numerous fruit-trees, especially of the genera Annona and Rollinia; the majority of Annona species and all the Rollinia species originated from the New Wold. Many of these species were carefully cultivated by indigenous peoples in Mesoamerica, the inter-Andean valleys, the Amazon region and other areas. Other annonaceous fruits of the New World include species of Asimina, Duguetia, Fusaea and Porcelia. These fruit –trees have a considerable diversity and degree of adaptation to different environment and are valuable material for hybridization, selection and vegetative propagation studies. The high nutrition value of the fruit, its vary distinct flavours and aromas and its attractive shapes and colours justify these efforts. There are three species, Annona cherimoya, A. muricata and A. squamosa, which are marginal in several regions of tropical America; in other regions, the technology for producing and handling the product has been developed to such a degree that they cannot really be included in this category. The known techniques and selected cultivars can be extended to regions where cultivation is still under development. Another three, A. diversifolia, A. reticulate and A. scleroderma, however, have been marginalized in spite of their intrinsic value and potential as fruit-trees. (Mahdeem H. 1994) [6].Custard apple is one of the most important fruit crop and it's area is expanding at a faster rate in recent years. It is mainly propagated by budding and grafting by using rootstock. However, the germination of custard apple seed is very poor and takes long time, very slow growth of seedlings limit its use as rootstock is very much essential to meet the growing demands for budding and grafting. These problems make difficulty in using custard apple as a rootstock. Studies have indicated that use of pre-sowing treatments to improve the germination and subsequent growth of seedlings in many fruits species. And also irregular germination, in custard apple seed may be due to dormancy or due to hard seed coat. Therefore, pre-treatment of custard apple seed is very important and can be done either by physical method such as scarification or by soaking in KNO_3, Urea, Hot water treatment, Cold water treatment, Thiourea, Cow urine, Cow dung slurry and GA_3 are to increase impermeability of the seed coat and also improve germination.
An experiment is carrying out to identify a suitable treatment for getting better seedling growth vigor. As a growth of seedlings is significantly affected by various pre-sowing seed treatments in various fruit crops.

Materials and Methods

The experiment entitle, "Effect of different pre-sowing treatments on shoot growth of custard apple (*Annona squamosa* L.)." was carried out at Instructional-cum Research Farm, Department of Horticulture, College of Agriculture, Badnapur, Dist Jalna. Vasantarao Naik Marathwada Krishi Vidyapeeth Parbhani, during the year 2015-2016. The details about material used and methods adopted during the course of investigation are given below under appropriate headings and sub headings. The experiment was carried out by sowing seeds in (15 x 20 cm) size polythene bags. The polythene bags were punctured with 4 holes to improve the drainage and filled with a mixture of 3:1 part of well fertile soil and well decomposed FYM. Seeds of Custard apple were purchased from Forest seed supplier, Jalna. Treated Custard apple seeds were sown in polythene bags in 2 cm depth which were properly filled, labeled with tags and placed as per layout of randomized block design with eight treatments which were replicated thrice. Sound and healthy seeds were selected for experiment. The seeds were soaked in different concentrations of GA_3 (400 ppm), KNO_3 (1%), cow dung slurry 10%, cow urine 10%, Urea (0.1%), Thourea (1%), cold water and Hot Water for 24 hours in beaker. The sinkers were sorted out from the floaters then seeds of Custard apple were treated with carbendazim 50 WP @ 2 g/kg. The seeds were dried for 10 minutes in shade. The dried seeds were sown in polybags. Watering was provided to seeds sown in polythene bags using water can and maintained the proper moisture level for germination of seed.

Results and discussion

The maximum plant height was achieved by treatment T_8 (19.57 cm) i.e. GA_3 400 ppm for 24 hr prior to sowing which might be due to fact that the effect of GA_3 in increased seedling height due to GA_3 pre-soaking may be due to cell multiplication and elongation in the cambium tissue of the internodal region causing increased internodal length without altering the number of nodes thereby causing cell elongation as reported by Pampanna *et al*. (1995) in sapota. Reflects in greater internodal length, ultimately resulting in increase in plant height. These result are conformity with Lay *et al.* (2013) [5] in papaya, Parvin *et al.* (2015) in black walnut seeds. The maximum stem diameter (0.32 cm) was recorded under the treatment GA_3 400 ppm for 24 hr this might be due to fact that GA_3 play vital role in stimulation of cambium and its immediate cell progeny, as observed by Parvin *et al.* (2015) [8]in black walnut seeds.

At 90 DAS, the maximum number of leaves per seedling was recorded in T_5 (12.67) i.e Thiourea (1%) for 24 hr. The increase in number of leaves with thiourea treatment may be due seeds germination can be attributed to a reduction of the preventive effect of seed coat and its

Cytokine activity in overcoming inhibition. The above results are conformity with Dhankhar and Singh (1996) [3] in Aonla, Cetinbas and Koyuncu (2006) [2] in *Prunus avium* L. seeds. The presented data revealed that, maximum leaf area (31.82 cm^2) associated when the seeds were soaked in GA_3 400 ppm for 24 hr prior to sowing which might be due to fact that, GA_3 seed treatment can be attributed to increase cell division, cell elongation and cell multiplication which reflect in maximum leaf area. The data regarding maximum fresh weight (3.56 g) and dry weight (0.82 g) associated when the seeds was soaked in GA_3 400 ppm for 24 hr prior to sowing which might be due to fact that, GA_3 seed treatment can be attributed to increase plant height, number of leaves, leaf area and stem diameter which causes rapid growth of plant which reflect into maximum fresh weight of seedlings. The results are conformity with the Parvin *et al.* (2015) [8] in black walnut seeds. This might be due to fact that, as fresh weight increases, it simultaneously increases the dry weight. Similar results have been reported by Parvin *et al.* (2015) [8] in black walnut seeds. Mobilization of water and nutrients transported at higher rate which might have promoted more production of photosynthetic product and translocated them to various plant parts which light have resulted in better growth of seedlings and hence more dry weight occurred. The result with confiromity with the finding of Lay *et al.* (2013) [5] in Papaya, Dhankhar and Singh (1996) [3] in Aonla and Anjanwe *et al.* (2013) [1] in Papaya. The maximum primary roots (48.47), secondary root (75.98) and root length (19.83 cm) per plant was recorded under treatment T_8 (48.47) i.e. 400 ppm GA_3 for 24 hr. The treatment with GA_3 might have resulted in more production of photo synthatates and their translocation through phloem to the root zone, resulting in more number of roots. Results are obtained in accordance with the results of earlier worker Anjanwe *et al*. (2013) [1] in papaya. The data regarding maximum fresh weight (0.37 g) and dry weight (0.37 g) of root associated when the seeds was soaked in GA_3 400 ppm for 24 hr prior to sowing which might be due to fact that, gibberellic acid seed treatment can be attributed to maximum fresh weight and dry weight of root. These results are conformity with the Anjanwe *et al.* (2013) [1] in papaya, Gurung *et al*. (2014) [4] in passion fruit, Parvin *et al.* (2015) [8] in black walnut seeds.

Table 2.Effect of pre-sowing treatments on shoot growth parameters at 90 DAS.

T. No.	Treatments	Height (cm)	Stem Diameter (cm)	leaves per seedling	Leaf are (cm^2)	Fresh weight of seedling (g)	Dry weight of seedling (g)
T_1	KNO_3 (0.1%)	16.87	0.30	11.00	28.55	1.61	0.58
T_2	Urea (0.1%)	15.87	0.26	10.27	24.00	1.23	0.38
T_3	Hot Water	16.73	0.29	10.47	26.13	1.57	0.56
T_4	Cold Water	16.13	0.28	10.33	25.26	1.31	0.42
T_5	Thiourea (1%)	18.40	0.32	12.67	30.84	3.17	0.79
T_6	Cow urine (10%)	17.67	0.30	11.60	27.25	2.32	0.58
T_7	Cow dung slurry (10%)	17.87	0.31	11.67	28.26	2.82	0.64
T_8	GA_3 400 ppm	19.57	0.32	11.87	31.82	3.56	0.82
S.Em.±		1.03	0.01	0.55	5.72	0.25	0.06
C.D. at 5 %		NS	0.03	NS	NS	0.76	0.18

References

1. Anjanwe SR, Kanpure RN, Kachouli BK, Mandloi DS. Effect of plant growth regulators and growth media on seed germination and growth vigour of papaya. Annals of Plant and Soil Res. 2013; 15(1):3134.
2. Cetinbaş M, F Koyuncu, Improving germination of *Prunus avium* L. seeds by gibberellic acid, potassium nitrate and thiourea. Hort. Sci. (Prague). 2006; 33(3):119-123.
3. Dhankhar DS, Singh M. Seed germination and seedling growth in aonla (*Phyllanthus emblica* L.) as influenced by gibberellic acid and thiourea. *Crop Res.* 1996; 12(3): 363-366.
4. Gurung N, Swamy GS, K Sarkar, SK, NB. Ubale. Effect of chemicals and growth regulators on germination, vigour and gowth of Passion fruit (*Passiflora edulis* Sims.). The Bioscan an Internat. Quarterly J of Life Sci. 2014; 9(1):155-157.
5. Lay P, Basavaraju GV, Sarika G, Amrutha N. Effect of seed treatment to enhance seed quality of papaya (*Carica papaya* L.) cv. Surya. G.J.B.A.H.S. 2013; 2(3):221-225.
6. Mahdeem H. Custard apples (*Annona spp.)* plant production and protection Series No. 26. FRO, Rome, Italy, 1994, 85-92.
7. Pampana Y, Sulkeri GS, Hulmani NC. Effect of growth regulators on seed germination and growth of seedling of Sapota [*Manilkara achras* (*Mill.*) Fosberg]. Karnataka J Agri. Sci.1995; 8 (1):60-64.
8. Parvin P, Khezri M, Tavasolian I, Hosseini H. The effect of gibberellic acid and chilling stratification on seed germination of eastern black walnut (*Juglans nigra* L.). J of Nuts. 2015; 6(1):67-76.