International Journal of Current Research in Life Sciences
Vol. 06, No. 10 (10), pp.606-607, 2017

IJCRLS

www.ijcrls.com

RESEARCH ARTICLE

STUDY ON PERFORMANCE OF DIFFERENT GENOTYPES IN JACK FRUIT (*ARTOCARPUS HETEROPHYLLUS LAM.*)

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Received 27th August, 2017; Accepted 12th September, 2017; Published 23rd October, 2017

ABSTRACT

An investigation was conducted to study the performance of different genotypes in jack fruit (*Artocarpus heterophyllus* Lam.) during 2016-2017 at Department of Horticulture, Faculty of Agriculture, Annamalai University. Twelve genotypes *viz*., AH-1 to AH-12 were used in the investigation. Based on the germination percentage and seed vigour, AH-5 was identified as best genotype for rootstock. In order to increase seedling vigour the seeds of AH-5 were treated with bioregulators *viz*., NAA (100 ppm, 200 ppm,300 ppm and 400ppm) and IBA (100 ppm, 200 ppm, 300 ppm and 400 ppm.). Among nine treatments soaking of seeds for 24 hours in 400 ppm of IBA gave superior performance. Significant interactions were observed for germination per cent, plant height, number of leaves, leaf length, leaf breadth and stem girth etc. The best growth attributes were observed in AH-5 which recorded higher germination percentage, plant height, number of leaves, leaf length, leaf breadth and stem girth. Among the different age of rootstocks tried for softwood grafting, maximum graft union success was recorded in 150 days old rootstocks and it was followed by 120 days old rootstocks.

Key words: Jack fruit, Genotypes, NAA, IBA.

INTRODUCTION

The jackfruit (*Artocarpus heterophyllus* lam.), known jack tree, jackfruit, or sometimes simply jack or jak, is a species of tree in the Artocarpus genus of the mulberry family (Moraceae). The jackfruit tree is a widely cultivated and also popular food item in countries *viz.*, India, Bangladesh, Nepal, Sri Lanka, Cambodia, Vietnam, Thailand, Malaysia, Indonesia and Philippines. The jackfruit tree is well suited to tropical lowlands and its fruit is the largest tree-borne fruit, reaching as much as 80 pounds (36 kg) in weight, 36 inches (90 cm) in length and 20 inches (50 cm) in diameter. The seed is 2-4 cm long, 1.25-2 cm thick, white and crisp within. There may be 100 or upto 500 seeds in a single fruit. The edible jackfruit is made of easily 100g of edible raw jackfruit provides about 95 calories and it is a good source of protein jackfruit seeds are rich in 13.7 mg of the antioxidant vitamin C providing protein. The fruit is also rich in vitamin B6, potassium, calcium, and iron. The juicy pulp of the ripe fruit could be eaten either fresh or preserved in syrup. The fruit's isoflavones, antioxidants, and phytonutrients mean that jackfruit has cancer-fighting properties.It is also known to help cure ulcers and indigestion. The bulbs used as raw or cooked (with coconut milk of otherwise): or made into ice cream, jam, jelly, paste or canned in syrup made with sugar or honey with citric acid added. The bulb of the unripe fruit is used as a vegetable and the seeds are roasted or fried and is sometimes called "vegetable meat".

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MATERIALS AND METHODS

A field experiment was carried out during 2016-2017 at the Department of Horticulture, Faculty of Agriculture, Annamalai University, to study the performance of different genotypes in jackfruit. The experiment was laid out in completely randomized block design and replicated thrice. Twelve genotypes were collected from different places in Panruti, Neyveli and Palur of Cuddalore district, Tamilnadu state. Jack seeds were collected from fully ripened healthy fruits. The seeds were sown in the polythene bags. Polythene bags of 200 gauge (25x15) thicknesses were used for raising jack fruit rootstocks. The pot mixture used for potting comprises of sand, red earth, Fym and coir dust in equal proportion. The observations on various growth parameters, plant height, stem girth, leaf breath, leaf length, number of leaves and Leaf area were recorded and analyzed statistically (Pance,V.G and P.V. Sukhatme. 1978).

RESULTS AND DISCUSSION

The germination of seeds has got direct relation with the weight of seeds, where the larger sized seeds resulted in higher germination percentage. The percentage of sprouting tended to increase with the increase in seed weight. The difference was to the tune of 44.0 percent which indicated that there was an advantage to be gained by selecting the heavy sized seeds in

Performance of Different genotypes in jack fruit (140 DAS)

Genotypes	Plant height (cm) 140 DAS	Stem girth (cm) 140DAS	Number of leaves (cm) 140 DAS	Leaf length (cm) 140 DAS	Leaf breath (cm) 140 DAS	Leaf area cm^2 140 DAS
AH-1	4.93	2.60	12.57	13.56	7.56	102.52
AH-2	41.42	2.56	12.23	13.12	7.34	96.31
AH-3	39.81	2.52	12.68	14.56	7.23	105.33
AH-4	39.02	2.00	11.45	13.98	6.45	90.24
AH-5	44.31	3.56	13.89	14.76	7.98	117.85
AH-6	33.92	1.98	11.00	13.34	6.87	91.62
AH-7	36.11	1.89	11.56	13.76	7.34	101.01
AH-8	34.94	1.78	10.34	14.34	6.56	94.12
AH-9	34.73	2.78	10.45	14.02	7.00	98.13
AH-10	36.92	2.87	11.57	13.54	7.55	102.24
AH-11	37.53	2.45	11.58	13.32	7.30	97.23
AH-12	37.51	2.00	11.68	13.76	7.22	99.35
SED	0.76	0.28	0.61	0.55	0.08	1.80
CD (p=0.05)	1.27	0.57	1.26	1.13	0.16	3.72

preference to smaller ones. Germination percentage on the 35th days after sowing had significant difference among the genotypes. Among the various genotypes tried, AH-5 recorded the highest germination percentage than the others. The next best genotypes were AH-6 and AH-3. However these genotypes were on par with each other on their performance. The lowest germination percentage was observed in AH-4 and AH-7. The similar results have been reported by Sonwalker (1951) in which he suggest that heavy seeds showed higher germination and earlier sprouting than small and light seeds. Khan (2003) reported that variation in seed size clearly influenced the seed germination in jack fruit. Large sized seeds germinated faster and achieved greater germination percentage than small seeds. Rapid and greater germination of heavy seeds might be attributed to large food reserves of these seeds. Seedlings from large seeds have sufficient reserves to sustain growth for a much longer period as reported by Saverimuttu and Westoby (1996). Differences in seed content such as starch and proteins are responsible for germination and differences of the above ground portion of the seedling, while physiological processes are involved in breaking dormancy or onset of germination as reported by Dyer (2004). Next to germination, the plant vigour has to be considered as one of the important criteria for assessing the suitability of the seedlings to be used as rootstocks. In the present study, the plant height, total number of leaves produced at various stages of growth as well as the stem grith had been taken into consideration. In respect of plant height, which was recorded at various intervals, the genotype AH-5 was found to be superior followed by AH-2 and AH-1. The height of seedlings belonging to various seed groups in terms of weight had significant difference. Since the rootstock seedlings are to be produced in a limited time of availability of such seeds as well as the viability. The initial vigour of nursery plants through simple seed selection brought to be taken advantage from the stand point of ultimate utilization of rootstock seedlings for grafting purpose. In case of emergence of leaves also AH-5 excelled the rest of genotypes in which AH-3 and AH-1 showed a slow rate of leaf production. For making use of the root stocks to produce the grafts, the stem girth is another important attribute, in which AH-5, 10, 9 and 1 have recorded more than 2.60 cm at 140 DAS. Among them, AH-5 have registered 3.56 cm as the mean value which was found to be an added advantage to have better compatibility to the well matured scions from the mother trees. The similar result obtained by Aliyu and Akintaro (2007) in cashew revealed that the number of leaves and stem girth, consistently ranked highest in the seedling derived from heavy sized nut. Based on the above favourable aspects the genotype AH-5 had been further utilized for standardizing the use of PGRs to improve the seedling vigour.

Conclusion

Based on the present investigation, among the various genotypes .The genotype AH-5 recorded the maximum growth parameters in jack fruit.

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