



Research Article

EFFECT OF DRYING MODEL ON POSTHARVEST QUALITY OF CASHEW NUT

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Abstract: The experiment was conducted at Agricultural and Horticultural Research Station, Ullal, Mangalore, Karnataka, India during 2016-17. On earthen floor, cow dung plastered floor, cement floor, fine sand floor and solar house driers the harvested raw cashew nuts were dried. The results of the study indicated that the cashew seeds dried on cow dung plastered floor shown significantly the highest per cent germination after 90 and 180 days of storage period compared to rest of the drying models used. The highest score for cashew nut appearance was found when the seeds dried on cow dung plastered floor and cement floor. The cow dung plastered floor was recorded highest processing percentage when seeds dried on floor after 90 and 180 days of storage period. With respect to processed seed kernel, the highest taste score was found on cow dung plastered floor and cement floor drying models.

Keywords: Drying models, Cashew seed drying, Postharvest Quality, Soil floor, Solar house drier, Fine Sand floor, Cement floor, Cow dung plastered floor

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Introduction

Cashew (*Anacardium occidentale* L.) is the most important commercial plantation and foreign exchange earning crops of the country and is a native of Central and South America. This crop is widely grown in tropical climates and it has very well adapted to the Indian conditions. The cultivation of this crop is increasing in Karnataka for its greater demands in the market. In India cashew is cultivating in an area of 10.40 lakh hectares with a production of 7.79 lakh MT. The national average productivity of this crop is 753 kg per hectare [1]. In India, it is mainly cultivated in Maharashtra, Goa, Karnataka and Kerala along the West coast and Tamil Nadu, Pondicherry, Andhra Pradesh, Orissa and West Bengal along the East coast. By knowing the importance of the crop, there is a great scope for the production of cashew seedlings. Therefore, to achieve greater success of grafted plants, rising of root stock is an important aspect in cashew propagation. In other way the postharvest quality of cashew seed nut depends on the drying technique after the harvesting of seed nut Hence the present study has been carried out on different methods of cashew seeds drying sowing for raising the rootstock in nursery and processing quality of the cashew seed unit

Materials and Methods:

The experiment was conducted at Agricultural and Horticultural Research Station (AHRs), Ullal, Mangalore during 2016-17. The raw cashew nuts used for this study were procured directly from cashew orchard of AHRs, Ullal. It is located at a distance of 10 Km South of Mangaluru on the way to Kasargod (NH-66). The altitude of the research station is 15 M above mean sea level (MSL) with latitude of 13° N and longitude of 75° E. Soil is mainly typical laterite soil of the West Coast with patches of red sandy loam. The insect and disease free nuts were selected and cleaned and were graded into uniform size for the experimental study. The drying floor like earthen floor, solar drying house, fine sand floor, cement floor and cow dung plastered floor were prepared. Five kg of harvested cashew seeds were spread over in each different drying floor models and seeds were left on floors for 3 days and drying was continued. The weight of the seeds after 3 days of drying was recorded. Then the seeds were stored in gunny bags for 90 and 180 days respectively.

The observations were made on germination percentage, seed appearance, processing percentage and processed seed taste at 90 and 180 days after seed storage. Data collected were statistically analyzed using analysis of variance through the Wasp1 statistical analytical software package and treatments were compared by following Duncan's multiple range test.

Result and discussion:

It is evident from the [Table-1] that initial weight of the nut was 5 kg in all the treatments. Three days after drying nut weight was lowest in solar house drying 4600g followed by fine sand floor and cow dung plastered floor (4500g respectively), while the lowest seed weight was on cement floor drying (4400g). 90 days after storage of the seed sown the highest seed germination (98.40%) found in cow dung plaster floor model followed by earthen floor (95.00). Significantly the highest seed appearance score was recorded (10) in cow dung plastered floor and cement floor drying, while the cashew seeds dried on earthen floor drying (9.00). The highest processing percentage was recorded on cow dung plastered floor (31.00) followed by earthen floor drying (30.00). The other best treatments were solar house drying and cement floor drying 27.60 and 27.40, respectively. The highest processed seed taste score was recorded on cow dung plastered floor and cement floor drying (10.00 and 9.10, respectively) and lower processed seed taste score was recorded in fines and floor drying and solar drying (8.10 and 7.80, respectively). The cashew seeds dried and stored 180 days and after sowing recorded the highest percentage of seed germination when seeds dried on cow dung plastered floor and cement floor (95.00 and 92.60, respectively) and lowest germination was in solar house drying model (81.00). The highest score with respect to seed appearance was noticed in cow dung plastered floor drying (9.00) followed by earthen floor drying (8.50). After 180 days of storage the highest processing percentage was observed on cow dung plastered floor (26.40) followed by cement floor drying (26.20) while lowest value was in solar house drying (23.80). The highest score with respect to processed seed taste was noticed in cow dung plastered floor drying (9.40) followed by earthen floor drying (9.20).

Table-1 Influence of drying models on postharvest quality of raw cashew nut

Treatment	Drying models	Weight of nut (g)		Seed quality							
		Initial weight of nut (g)	3 days after drying (g)	After 90days				After 180 days			
				Germination Percentage (%)	Seed appearance (Scale- 1-10)	Processing Percentage (%)	Processed seed taste (Scale- 1-10)	Germination Percentage (%)	Seed appearance(%) (Scale- 1-10)	Processing Percentage (%)	Processed seed taste (Scale) (1-10)
T1	Earthen floor	5 kg	4500	95.00	9.00	30.00	9.00	92.00	8.50	25.00	9.20
T2	Solar house drier	5 kg	4600.00	91.80	7.80	27.60	7.10	81.00	7.40	23.80	7.00
T3	Fine sand floor	5 kg	4500.00	89.00	8.60	25.20	8.10	90.40	8.00	26.00	9.00
T4	Cement floor	5 kg	4400.00	93.80	10.00	27.40	9.10	92.60	8.00	26.20	9.00
T5	Cow dung plastered floor	5 kg	4500.00	98.40	10.00	31.00	10.00	95.00	9.00	26.40	9.40
	F Test	*	*	*	*	*	*	*	*	*	*
	SEm±	41.570	0.799	0.158	0.407	0.100	0.530	0.200	0.187	0.122	
	CD@5%	124.296	2.389	0.474	1.218	0.300	1.586	0.600	0.561	0.367	

During the drying process, nuts undergo reactions that degrade the quality especially in terms of colours and flavours. In comparison with other food products, reports on the drying of pistachio nuts and parameters affecting their quality are limited [2]. Rostami and Mirdamadiha, (2004) [3] evaluated the effect of various dryers on the quality of dried pistachio nuts. Sun drying produces the best nuts in terms of colour and shape uniformity, whereas, pistachio nuts obtained from the continuous cylindrical dryer had the least uniformity. According to the findings of Mursalim and Dewi, (2002) [4] solar dryer had a better overall result, resulted in a first-class quality (M1) and germination of the dried products, as compared to the sun-drying. But the present study is contrary to the findings of Siddique and Wright (2003) [5] who reported that the seeds dried on earthen and cow dung floors have not retained high seed viability and vigour, whereas the seeds dried on the concrete floor retained seed viability and vigour. But present study confirmed that cow dung plastered floor was found to be the most superior for raw cashew nut drying. Banerjee and Shrivastava (2018) [6] tried rapid infrared conditioning were as an alternative conditioning method. Comparative study of different temperature levels of infrared conditioning was carried to determine the effects on quality parameters of cashew kernel conditioning before peeling were compared with hot air conditioned kernels. Second level of infrared conditioning i.e., 160°C for 8 minutes was found best conditioning treatment out of all infrared heating levels tried, yielding kernel quality comparable to conventional hot air conditioning.

Conclusion

The present study revealed that among the drying model's cashew nut dried on cow dung plastered floor found to be the most suitable drying model for raw cashew nut seeds with respect to different parameters viz., germination percentage, seed appearance, processing percentage and processed seed taste and quality. The cow dung plaster floor has ability to absorb solar radiation and reflect the radiation in such a way that cashew nut can utilize its effect to maintain acceptable quality of kernels and preserve the plumule and radicals of seed nut to germinate in next season for rising the potential root stock plants compared to other models of drying.

Application of Research: To improve postharvest qualities of cashew nut by different drying models

Abbreviation: DCCD: Directorate of cashew nut and Cocoa Development

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