

SPOILAGE OF PROCESSED ARECANUTS

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Fresh ripe arecanuts are usually sundried with the husk in-tact. They are either marketed during the season itself as *New supari* after husking or stored without husking during the monsoon and later sold as *Choll supari*. The quality of the nuts is principally influenced by the drying process, ambient temperature and humidity during sundrying and also the type of storage. Lack of proper drying yard for drying, improper spreading and turning, exposure to unexpected rains during drying period, etc., result in prolonging the drying period, paving way for the onset of fungal infection, not only in the husk but also in the deep seated kernel, reducing thereby the quality of the kernel (*supari*). Moreover, inadequate storage conditions during monsoon season permit easy absorption of moisture by the processed nuts during storage, resulting in accelerated pace of development of fungus inside. The market value of such affected nuts declines considerably because of their inferior quality. This paper deals with the spoilage of arecanut due to fungal infection in drying yard and storage and prevention of such infection.

Symptoms and damage :

Both the husk and kernel are involved in the fungal attack. However, the infection of the kernel is of paramount importance because of the obvious fact that it is the portion extensively used as masticatory. The invading fungi first attack the embryo and then spread to the central white core. Once this tissue is completely disintegrated, the fungi pass on to the adjacent brown tissues. In advanced stages of infection, the kernel will present a hollow cavity inside due to the total disintegration of the tissues by the invading fungi. In certain cases, the fungal fructification can be observed on the exterior of the kernel also. The affected white core will be discoloured, the colour being dependent on the fungi involved in the attack. Species of *Aspergillus*, *Botryodiplodia*, *Penicillium*, etc., have been found to be involved in the infection of kernel. Of these the majority of infection is caused by the former two groups of fungi.

The extent of fungal damage depends on the season of drying. The percentages of fungal infection observed in ripe nuts

harvested and dried during different months were: October, 61.5; November, 52.8; December, 43.8; January, 31.5; February, 11.0 and March, 25.7. The higher percentage of infection in October-November may be attributed to the rainfall and low temperature during the period, creating congenial conditions for the development of fungi in the nut. On the other hand, in February-March, there was practically no rainy day and the temperature was also comparatively higher and hence the lower percentage of infection.

Source of infection :

The question often raised is whether the nuts contract fungal infection during sun-drying (post harvest infection) or the fungi gain entry inside the kernel during its developmental stage itself. Detailed laboratory studies failed to show the presence of any fungus inside the kernel during different stages of nut development indicating thereby that there was no incipient fungal infection. Moreover, when nuts are harvested by eliminating soil contact and dried in air oven at 65°C. for 63 hours, the kernel is found free of fungal infection. On the other hand, when the usual commercial type of harvesting is done and nuts are sun-dried, the infection is about 60 per cent. This clearly shows that the nuts contract fungal infection only from the soil. This may be at the time of harvesting and/or during drying.

Types of drying yard and infection percentage :

When nuts are commercially harvested and one lot dried in a mechanical drier at 60 to 62°C for about 72 hours and the other lot sun-dried on the drying yard (which takes about 40 days), the infection percentage in the former was found to be 3.6

as against 54.7 in the latter. This prompts one to think that an accelerated process of drying coupled with elimination of soil contact with nuts during drying will help to reduce the fungal infection to a considerable extent. Further, different types of drying yards were also tried. Ripe nuts after harvest were sun-dried on cement, brick and soil drying yards and fungal infection assessed after satisfactory drying. The data are presented in Table 1.

TABLE 1
Fungal infection of nuts on different drying Yards

Drying yard	Infection Percentage	
	Commercial harvest	Soil contact eliminated
Soil	56.7	—
Brick	15.3	13.3
Cement	12.5	5.0

It is seen from the above table that fungal infection can be reduced to 5 per cent if harvesting of nuts is done eliminating soil contact and drying taken up on cement floor. The number of days required for satisfactory drying on cement floor is 30 as against 40 on compacted soil floor. In this connection, it may be pointed out that in some parts of Mysore state harvesting of arecanut is done by lowering the bunches through rope, and this practice seems to be of interest and worth emulation.

Storage and infection :

The fungal infection of nuts is bound to increase in storage if the storing facilities are not good enough. Usually the nuts are stored during the rainy season till September when there exists high humidity also. In order to see the effect of different types of storing on fungal infection and moisture

absorption in kernel, the dried nuts were stored in jute bag, polythene lined jute bag and air tight metal bins in May and periodically examined. The data obtained at the initial and final stage of experiment are given in Table 2.

TABLE 2
Fungal infection in storage

Type of storing	May		September	
	Infection %	Moisture %	Infection %	Moisture %
Jute bag	16.0	9.5	32.3	15.6
Alkathene-lined jute bag.	16.0	9.5	22.0	13.1
Air tight metal bins.	16.0	9.5	17.7	11.3

It is seen that moisture percentage as well as fungal infection increase when nuts are stored in plain jute bags. Nuts stored

in air tight bins had the least percentage of infection and moisture percentage. If nuts are stored in alkathene lined jute bags the fungal infection is found to be lower than in nuts stored in ordinary jute bags probably due to the reduced moisture intake. From practical point of view, therefore, this seems to be a better method of storing.

Thus the studies show that fungal infection of processed arecanut is due to improper drying methods and defective storing and that the same can be reduced to a considerably low level by taking up sun-drying of ripe nuts on cement floors and storing nuts in polythene lined jute bags.

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