

Rat Damage to Coconuts in Minicoy - An Investigation on the Contributing Factors

S. Keshava Bhat and P. M. Jacob

Central Plantation Crops Research Institute, Regional Station, Minicoy - 682 559, Lakshadweep

Introduction

Minicoy is the southernmost island of Lakshadweep group, situated in the Arabian Sea, about 400 km south west of Kochi. It has an area of about 4.4 sq km and population of around 9000. The entire island is formed by coral limestone. The soil is highly porous, well drained and alkaline with a pH of 7.0 to 8.5. It is rich in calcium and very ideal for coconut, which is being grown in this island for centuries.

Dense Population of Palms

In Minicoy, the islanders do not follow any definite spacing for planting coconut seedlings in their garden. One cannot see a single garden with the recommended spacing in the entire island. People say that as the number of individuals increased in each family, the extent of land holdings diminished and the owners used to plant more and more coconut seedlings in the available space and certain farmers even plant

canopies (Fig. 5), facilitating the rats to move with ease from one palm to the other. Added to this, with the ample food and water supply in the form of coconut, the rats seldom come to the ground for foraging. Unlike in the mainland where coconut kernel is not the major food item of black rats (Bhat, et al., 1995), in Minicoy the coconut kernel forms the bulk in their diet (Advani, 1984).

By thinning out the coconut gardens

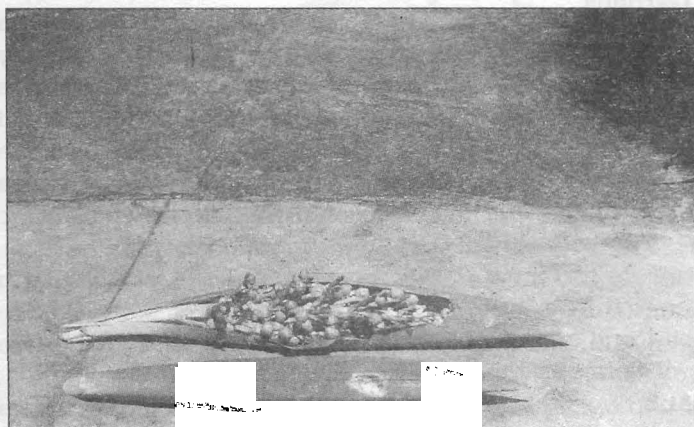


Fig. 1. Spathe damaged by rats at Minicoy



Fig. 2. A heap of rat damaged nuts collected from a garden at Minicoy

Presently, there are about 41,000 coconut palms yielding nearly 10 lakhs of coconuts per year, average yield being 24 nuts per palm per year. Though there are no major diseases for this crop, certain pests such as the black rat, *Rattus rattus* L. pose severe problem in limiting the yield of palms. In certain areas of Minicoy, the problem is so serious that about 55 per cent of the crop is being eaten away by this rodent (Advani, 1985,). A field survey was conducted during July to December 2002 to find out the possible causes for this high level of infestation in Minicoy. Observations made during the survey are discussed here.

seedlings in the boundaries side by side (Fig. 3) to mark their area (Jacob, et al., 2002). In earlier days, the social status of the individuals is determined based on the number of coconut palms they possess and not by the extent of land holdings they have. All these factors together resulted in very dense population of palms in the entire island (Fig. 4).

It has been estimated that there are on an average more than 400 coconut palms in one hectare of land in Minicoy as compared to 170 - 200 palms normally recommended (Muralidharan, 1999). This high density of coconut palms resulted in overlapping of

either by removing the unproductive palms and uprooting the senile and unhealthy seedlings and following proper spacing it is not only possible to increase the per palm yield (Muralidharan, 1999) but also to check the free movement of rats from palm to palm through the fronds.

Unhygienic Crown Conditions

Cleaning the crown of coconut palm is one of the recommendations for reducing the pest incidence in coconut. However this practice is not being followed in Minicoy. The presence of plenty of dried matrix, frond bases and leaflets on the crown (Fig. 6) gives a

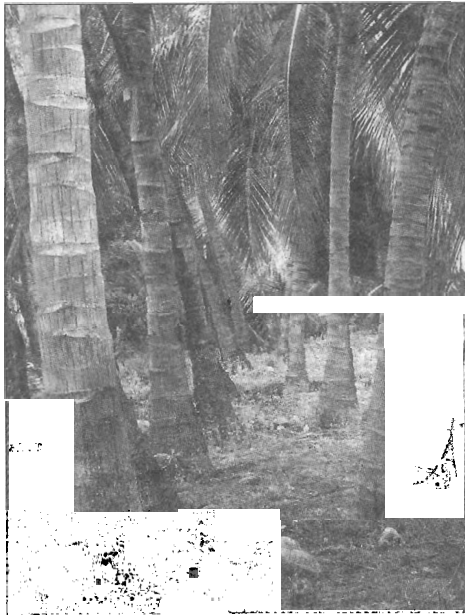


Fig. 3. Close planting of coconut palms in the boundaries

very protective environment for the rats to construct nests and breed on the crown (Fig. 7) throughout the year. Bhat and Sujatha (1986) also reported that **in coconut plantation the rats mostly live on the palm crowns and not on the ground.** Hence, by frequent cleaning of the crown, one can discourage the rats from constructing the nests there.

Delayed Harvesting of Nuts

In many of the gardens of Minicoy, the mature coconuts are not being harvested at the recommended interval of 45 days. In some of the gardens, hardly two to three harvests are being done in a year. Due to this delayed

harvesting, several mature bunches remain on the crown unnecessarily for longer periods making the crown very dense. In several gardens, the mature nuts are not even harvested but left to fall by themselves leaving the dried and empty bunches to remain on the crown

for longer periods, further protecting the breeding places of rats. By harvesting the nuts and removing the empty bunches at regular intervals, the breeding sites of rats could be thinned out.

Unattended Gardens

While going through the 'pandaram' (farm area) side of the island, which constitutes nearly 50 per cent of the **total area of the island, we can see too many unattended coconut gardens with lot of wild growth inside.** The fallen, coconuts are left uncollected which eventually germinate and grow by itself, further adding to the density of palms. In such cases, one can see different age groups of palms in the same garden (Fig. 8) Apart from this, a number of wild trees are also seen growing along with coconut palms, which together give the appearance of a mini forest (Fig. 9). Such habitat,



Fig. 4. A view of a high density coconut plantation in Minicoy

where both food and shelter are plenty, form a congenial atmosphere for rats to thrive and multiply. By giving proper attention to such gardens, one can definitely keep the rats at bay.

Absence of Predators

Predators are very important links in any of the food chains in nature. They are primarily responsible for the maintenance of natural population of wild animals in equilibrium. All the islands of Lakshadweep are conspicuous by the absence of effective predators of rats such as rat snakes, owls, kites, etc. It was reported that in oil palm plantations of Malaysia, the rats were effectively controlled by the introduction of barn owls (Lenton, 1983). Lakshadweep is probably the only place in India where rats can move freely without the fear of any of the predatory animals. Such conditions where there are no natural enemies but

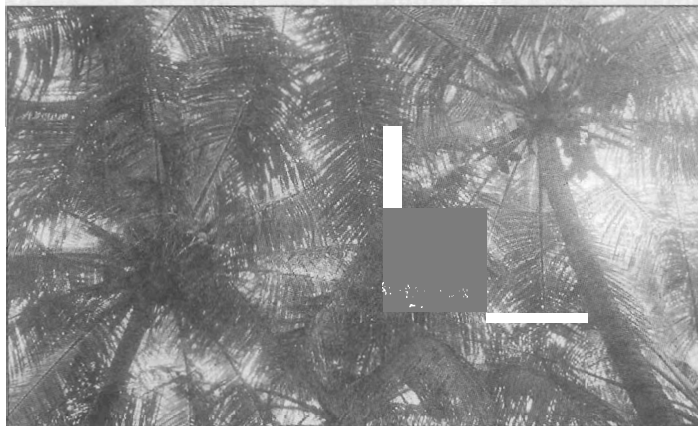


Fig. 5. Highly overlapping canopies of coconut palms



Fig. 6. Ideal crown conditions for rats to breed



Fig. 7. Nest of a rat situated on the crown



Fig. 8. Unattended gardens showing different age groups of palms

with ample food and safe shelter serve as a haven for rats to breed and multiply. While walking through the roads of Minicoy during night hours, one can often hear the cracking sounds of nuts by rats and it is not strange if one hears such sounds even during day time as there is no fear of any predatory animals. Cats, however, are found in good numbers but their activities are mainly on the ground level, hence cannot be a deterrent for rats which seldom come to the ground for foraging. Crows are also found in abundance in Minicoy, but they have not become effective predators of rats and very often they were busy in pecking the leftover kernel in rat-damaged nuts on the crown rather than hunting rats.

Non Involvement of Farmers in Rat Control Operations

In Minicoy Island, the farmers feel that the government should take

primary responsibility for the management of pests and diseases in their coconut gardens. Hence, unlike in the mainland where the farmers themselves take up the initiative for plant protection operations in their garden, the farmers in Minicoy do not involve themselves in any such operations including that of rat control. With the limited manpower in most of the government departments, it is very difficult to control rats effectively in the entire area without the active involvement of the farmers in rat control operations. If each farmer himself takes up the primary responsibility of rat control in his own garden with the guidance of the government departments, it is easier to manage rats in the entire island.

Summary

Thus, it can be summarized that rat menace in Minicoy is for certain extent due to improper cultural management of gardens and also due to the ecological imbalance caused by the absence of predators. It will be easier and more economical to manage this pest if the above conditions are improved and individual farmer takes up primary responsibility for the

rodent control with the guidance and support from government.

References

- Advani, R. 1984. Ecology, biology and control of black rat, *Rattus rattus* in Minicoy island. *J. Plantn. Crops*, **12** : 11-16.
- Advani, R 1985. Rodent pest management in the coconut plantations of India and its islands. *Indian Cocon. J.* **16** (2) : 3-9.
- Bhat, S. K., Advani, R., Sukumaran, A.S. and Vidyasagar, P.S.P.V 1995. Ecology, biology, economic status and control of economically important rodents in plantation crops. In : *CPCRI Annual Report for 1994-'95* pp. 168-178.
- Bhat, S. K. and Sujatha, A. 1986. A study of the species of small mammals in mixed coconut - cocoa gardens in Kerala. *Planter*, **62** : 428-432.
- Jacob, P. M., Bhat, S. K. and Vasanth- asenan, R. 2002. Increasing production and productivity in the existing coconut gardens of Lakshadweep islands. *Indian Cocon. J.* **33** : (5) : 2-4.
- Lenton, G. 1983. Wise owls flourish among oil palms. *New Scientists* (Feb. 1983) : 436-437.
- Muralidharan, A. 1999. Effect of crowding and competition on growth and yield of coconut in Lakshadweep. *Indian. Cocon. J* **30** (3) : 1-2.



Fig. 9. Coconut palms grown along with other wild trees