RATS ARE one of the most important pests in paddy fields in tropical Asian countries. The dominant species in Peninsular Malaysia is the rice field rat (*Rattus argentiventer*).

Other species found there are the Malayan wood rat (*Rattus tiomanicus*), the house rat (*Rattus rattus diardii*), and the large bandicoot rat (*Bandicota indica*).

The barn owl (*Tyto alba*) has been found to be a very effective biological agent for controlling rats (Fig. 1). Its use not only increases farmers’ income by reducing rice losses and saving the cost of chemical ratkiller, but it also saves paddy fields from chemical pollution. An additional benefit is that farmers are less exposed to harmful chemicals.

**Reproductive rate of rats**

The female rat becomes sexually mature when it is three or four months old. In plantations and fields, a female rat can reproduce once every two months, giving birth to between four and eight offspring per litter.

At this rate, the rat population has the potential to increase 500 times each year. Due to the high reproductive rate of rats, an “explosion” of rat populations is a common occurrence in plantations, if there is not adequate control.

**Artificial nesting place for owls**

The rate of propagation of barn owls is limited mainly by the availability of nesting sites. Thus, to increase the population of barn owls, more nesting sites must be made available. This can be done by placing nest boxes at the rate of one box per 40 hectares of paddy fields. Farmers can make a nest box themselves (see Fig. 4).

Nesting materials can be put inside the box. Straw or hay should not be used, since these can support toxic fungi. Broken bark, pine needles and leaves are all suitable as nesting materials.

Owls regurgitate castings of the undigested fur and bone of their prey. These build up with the droppings into a thick deposit. Some experts recommend that these deposits should be cleaned out every year, but they accumulate in the wild with no apparent ill effects. We recommend that the nesting places are best left alone, with as little disturbance as possible.

**Feeding habits of barn owls**

Barn owls feed almost exclusively on rats in paddy areas (rats make up 99% of the diet). Owls therefore prefer to live in an environment where the rats are abundant.

An adult bird requires about 90 gm. of food a day, which is equivalent to two rats of average size (Fig. 2 and Fig 3). It is estimated that a pair of breeding birds and their chicks (usually 4 - 5 chicks) might eat as many as 3,000 rats each year.

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Controlling rats with barn owls

The Malaysian Department of Agriculture has successfully implemented a program to control rats using barn owls in paddy fields throughout Peninsula Malaysia. One nest box was placed in every 40 hectares of paddy fields.

Before the program was implemented, rice farmers lost more than 8% of their rice crop each season to rats, and about eight applications of chemical ratkiller were used each season to control rats.

The project has now been implemented over 3 - 4 cropping seasons. It is successfully controlling rats in paddy areas. Farmers find that they need to apply chemical ratkillers only once each season, and the crop losses due to rat damage have been reduced to less than 1-2%. The increase in farmers’ income from the use of barn owls is US$7.6 (RM 29) per hectare per cropping season. To this should be added the cost reduction from fewer applications of chemical ratkiller. This is estimated to be a saving of around US$30.5 (116 RM) per hectare per year.

Note: Rice field rats have a large territory. A rat may move up to 200 meters in one night. Therefore, efforts of an individual small-scale farmer to control rats on his farm by chemicals or traps are likely to end in failure.

On the other hand, one pair of barn owls can control rats in an area as large as 40 hectares. This is one of the reasons why this method is strongly recommended.