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RESEARCH ARTICLE

RAT MENACE CONTROL FOR SAFE EXECUTION OF LABORATORY EXPERIMENT IN CROP PLANTS

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Abstract

Rodents, as one of the major important vertebrate pests are directly related to production, storage and processing of the agricultural crops. Unlike the insects and fungi, which infest the storage, rodents plunder places whatever the temperature or moisture content of the grain or air. Carrying in vitro experiments on crop plants in their presence is a challenging task and protecting the experiment from rats required methods for their control. Various methods: rat trap, poison, trubble gum, ultrasonic vibrator etc. failed in front of them. Finally a physical protection became successful in curbing the rat menace for pilot crop plant production in laboratory.

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Introduction

Rats are major vertebrate pests related to production, storage and processing of the agricultural crops (Advani 1987). Unlike the insects and fungi which infest the storage, rodents plunder places whatever the temperature or moisture content of the grain or air hence are considered to be the most harmful ones. In tropical countries rodents pose a continuous problem because of the climatic conditions, uninterrupted food supply and relatively open structures. Proximity to humans protects them from many natural enemies. Therefore rats and mice can always be found near man. Rat infestation patterns are as unpredictable as the climate. These filthy creatures are also carriers of diseases which are harmful to man. Control of a rat infestation is rarely completely successful; but if it is, it is usually only for a very short period. Therefore there is an urgency for continuous monitoring even after a successful control campaign regardless of the techniques and bait used. Despite the advances, rodent problems have not gone away, partly because rats are highly adaptable and often refuse to eat the bait or seem to eat it endlessly without suffering any ill effects.

In vitro studies serve as the better method as these reduce costs, more directly assess product performance and offer benefits in terms of ethical considerations (Polli 2008). Carrying out in vitro experiments in laboratory for large number of genotypes with greater sample size require space, the limiting factor in most laboratories. For carrying out work on crop plants successfully, rats were a big menace. Although growth chamber is a safety option but it cannot hold a large number of samples in one go. So experiments on crop seeds are carried out in laboratory in open. The article describes various rat control methods used for the success of the crop experiment. Rats are intelligent enough to protect themselves from various control strategies. Still some of the strategies used are as follows.

Identifying the source of entry

The first and foremost way to control rats is to identify the source of their entry. Repairs to gutters, doors and floors help restrict access. Equally, removing rubbish and scrub for about a meter around the experiment removes local rat harborage and discourages their approach. It was difficult as well as expensive to close all the entries which included the sink pipes, broken windows, exhaust fans etc. With rats being able to get through a hole the size of a man's thumb and mice through even smaller openings, total exclusion isn't practical.

Rat trap

The second simplest solution that comes to mind is to use a rat trap (Figure 1 a). Keeping sweet eatables or ghee applied food act as a magnet for them and rats can be caught easily but after a few days thorough washing is required to remove the smell as it makes them aware of the trap.

Use of poison

Another method is to use poisonous substances (Figure 1 b) (mortein and roban) to kill the rats and be free of them. If bait is placed directly on the ground, it may be approached relatively quickly, but it will not be readily eaten until the rats are sure that it is safe to eat. They will eat small quantities at first, which, if followed by unpleasant symptoms, will deter them from eating any more. Rats need to eat the poison regularly each day in order to ingest sufficient quantities of rat poison to cause death. This is accompanied with the problem of finding dead rats in the working place.

Additional innovative control methods

Trubble gum/glue pad

Contact was made with my fellow mates, teachers and pest control people who gave information about a glue pad which acts as a trouble (trubble) gum (Figure 1 c) for the rats. Rats come looking for food and get stuck on the pad and it becomes difficult for them to get off from there. This also worked for a short time.

Ultrasonic vibrator

Ultrasonic vibrator (Figure 1 d) releases sound waves which cause rats to run away from the place and helps protecting the experiment. This device gave relief for few days but rats become used to this noise after sometime.

Iron and nylon net: an effective design

The physical protection was the only way left. The trays having the crop seed material kept on the shelf were covered with iron net on the sides along with nylon net covering them from top and sides (Figure 1 e). The rats were unable to cut and enter into the setup. This has proven to be an effective design against rats till now.

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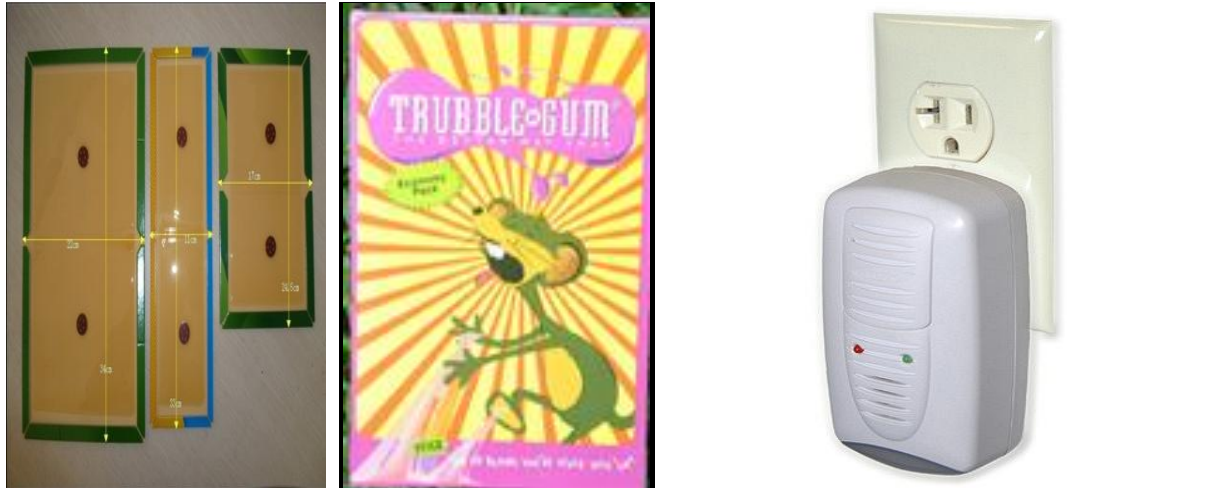
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a) Rat trap

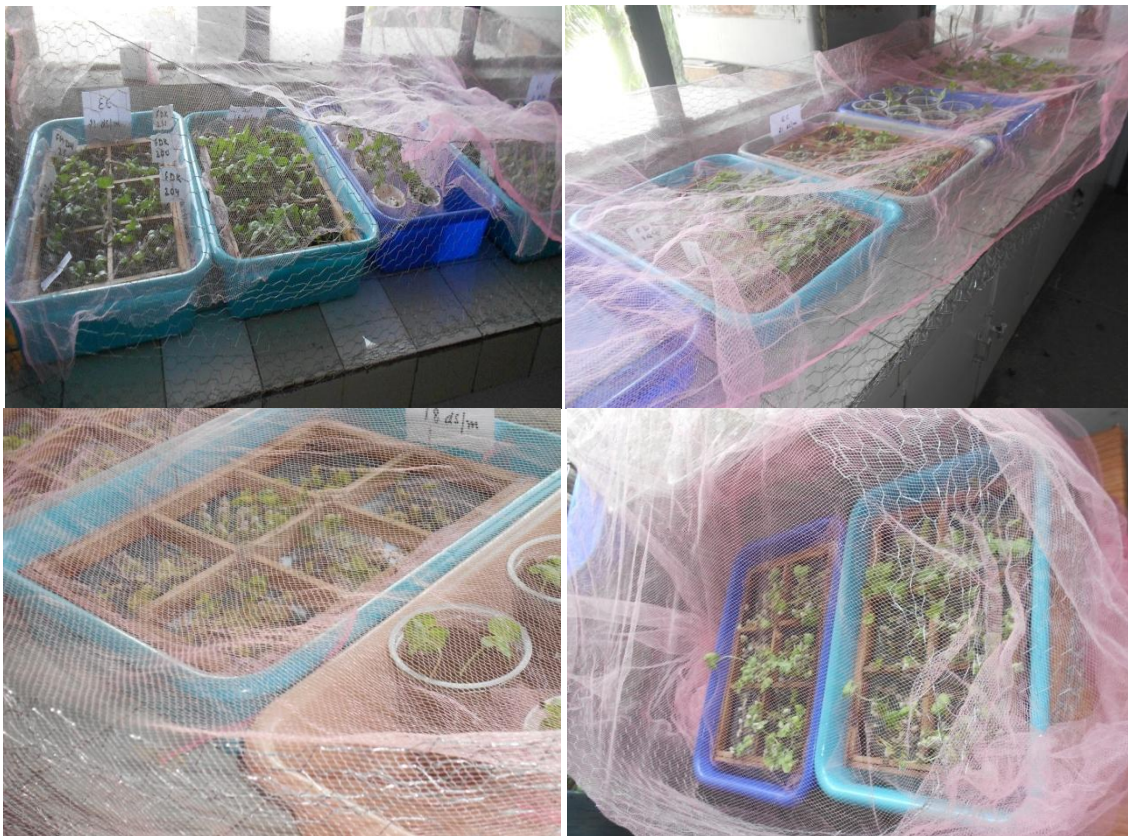


b) Rat poisons



c) Trubble gum/Glue pad

d) Ultrasonic vibrator



e) Nylon and iron net

Figure 1: Various rat control methods in the laboratory