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Review Article

The most importantmethods used to estimatethe population densityofrodents

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Abstract

This papersummarizesthe most importantmethod of estimatingthe population densityfor rodents. These methodsarewire-box traps, Active burrows method,Food consumption methodandby examining theeffects ofrodent andcan be used toevaluatethe efficiency ofrodent control. Methods of estimating the density of rodents vary depending on the nature and location.

Introduction

Worldwide, there are about 1700 species of rodents, but only%10–5are major pest species in agricultural and urban environments, and even fewer cause problems over larger geographic areas. Some of these consume substantial amounts of agricultural produce, and in many developing countries, farmers consider rodents the main impediment to higher yields (Makundi*et al.,* 1999). Every year, rats in Asia consume food crops that could feed 200 million people for an entire year (Singleton 2003).

In Indonesia, rodents are the most important pre-harvest pests in economic terms, causing on average at least 15% annual losses of rice (Geddes 1992). In Africa, the numbers are similar. Damage due to rodents in Tanzania causes an estimated annual yield loss of 5–15% of maize (corn), corresponding to about $45million, and food

which could feed about 2 million people (Leirs 2003). In parts of South America, native rodents cause crop damage varying between 5–90% of total production (Rodriquez 1993). Obviously, we need better pest control strategies than we have today.

The design of rodent control strategies has both an ecological dimension, relating to the interaction of the pest population and its resources and enemies (Singleton *et al*., 1999) and an economic dimension, relating to crop damage, which affects yield, and the use of pesticides, which in turn affects production costs (Carlson and Wetzenstein1993). Bio-economic analysis of pest control has been related primarily to invertebrate pests and weeds, whereas vertebrate pests have been largely ignored. Here we show how ecological and economic factors may be incorporated in bio-economic models aimed at improving control strategies of agricultural rodent pests(Stenseth*et al.*, 2003).

.The main objectives of this studies aim to summarizethe most importantmethod of estimatingthe population densityfor rodents for implementation of rodent management programs.

1-Trapping method:

Wire-box traps are one of thebest methodsthat are used insurvey,classificationandestimatethe population densityofrodents.Also, can be usedin the evaluation ofrodenticidesefficientand sometimescan be usedas a methodtorodent control.

Example: numbers of wire-box traps were baited and distributed twice every 15 days at 6pm and collected at 7am.

The captured rodents were classified and recorded. The Percentage of every species was estimated as a percent from total rodents captured during the study period as follows.

Population density = Number of rodent species / Total rodents captured×100

Trap index = No. rodent captured / Total traps distributed

These results with agreement with Howrad (1985); Asran*et al*.,(1985);Asran (1994); El-Deeb*et al*.,(1999) and Baghdadi (2006).

2-Active burrows method:

This method can be used in difficult areas such as modern land reclamation and desert and is characterized by burrows active presence of fecal talk as well as the existence of modern soil at the entrance to the burrow by footprints and the presence of traces of food in their burrows and can identify burrows active lock all burrows at night and examined in the morning and see the active burrows and when measuring the efficiency of pesticide active burrows being counted before and after treatment.

The number of active burrows was counted during study period by using the sand to close all burrows then count the opened ones at the next day during four consecutive days every month. The population of active burrows percentage in the area was estimated as follows.

Population of active burrows% = Number of active burrows /Total burrows examined all over × 100.

These results with agreement with Jackson (1979); Abdel-Gawad& Maher Ali (1982);Dowing&Murphy (1994); Feliciano *et al*., (2002) andDesoky (2007).

3-Food consumption method:

This methodsummarizes`of the increase or decrease from the rodents population was estimated as percent from the initial food distributed as follows:

The distributed amounts of bait in stations or on a mattress plastic weights 250 gram in station, for example, in the presence places of rats and placed for a limited period.

Total number of rodent = consumer of stations a day /1÷10 rodentdominant weight in the region.

Population density= Total food consumption (gm) during month/ Total food consumption (gm) allover the year× 100.

So, on the basis that the mouse eats 1÷10 of weight per day and can be used this way in public places such as schools and important buildings, hotels, hospitals, for example, ... etc.
This method is a process when measuring the efficiency of any pesticide mice where the consumer is calculated from the bait before treatment in a limited period and then the taste of the consumer after the transaction during this period and which can calculate the efficiency of the pesticide.

The efficiency of pesticide = consumer taste before treatment -consumption of bait after the transaction / consumer of bait before treatment x 100.

These result agreements with Tabeni& Ojeda (2005) and Desoky (2007).

4. Examine the effects ofthe rats:

4.1.Squares method

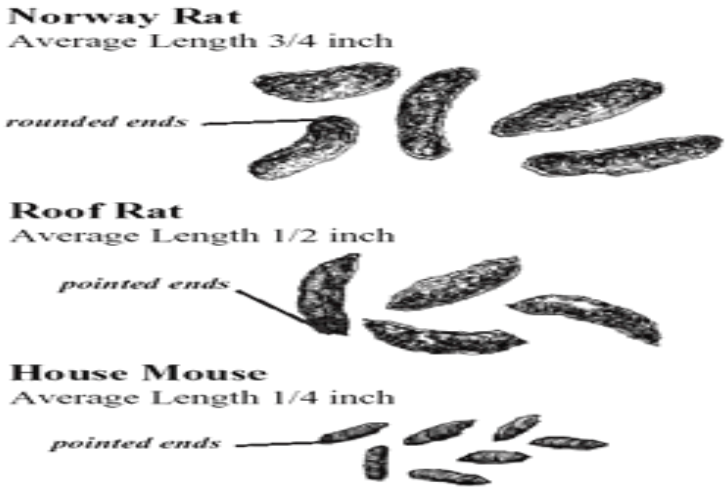
Affects thatsuchfootprintsmiceandratstailscan be seen inthe softlandorsand.Weworksquares inthe area tomeasure theintensityof eachsquare feetandthese squares coveredwith limeorsandorthe softpowderandthatwhenratsroamleavetheir impact onthosesquaresandsocanthe population densitycalculationfollowsas. If we assume40 squaresworkedin one areaandwerefootprintsinmice10squares calculateddensity, *10/40x 100*.These result agreement with Tabeni& Ojeda (2005).

4-2-Feces method

The wilted mice of the key things to deduce the presence of rats in burrows or in the region,usingthesefeces can find out if the burrows active or inactive. If the feces soft and shiny shows that mice are still living in these burrows if either stool dry and dark color indicates that burrows inactive and the presence of different sizes of feces of the same shape indicates the presence of different ages of mice.

Example: In each site, feces in three square meters were collected and counted as an index for the changes in rodent population at each inspected date (once monthly).The percent of feces was estimated as a percent for overall year total as follows:

Rodent numbers = Total number of feces / Number of feces of rodent dominant individual per day x100.
Population density %= Number of feces in area unit during month / Total number of feces during yearx 100.
This method canbe usedin the classification ofmice .These results with agreement with Ahmed (2001);El-Deeb*et al*., (1996) and Desoky (2007).



Important Note:
all methods to estimate the density of rats indicates the density of virtual or approximate density and not the truth. Is a discretionary process demonstrates the preparation of almost mice.

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