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## **Impact of Rodent Infestation on Availability, Safety and Nutritional value of Maize Stored On-farm in Lowland Tropical Zone of Kenya**

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Rodents are the second most important storage problem after insects during on-farm maize storage in Kenya, and the greatest storage problem in the lowland tropical agro-ecological zone. However, there is limited information on the actual magnitudes of food lost, and food safety issues associated with rodent grain damage. Such information would help to improve maize postharvest management. Farmer stores were monitored over 3 months under natural infestation conditions to quantify actual weight losses due to rodents. Rodent trapping was also carried out to determine rodent species associated with the losses and their population. Additionally, samples of rodent-damaged and non-damaged grain were analysed for total mould count (CFU/g), mould incidence, total aflatoxin contamination, proximate content, and amino-acid and fatty acid profiles. Cumulative weight losses ranged from 2.2 to 6.9% in shelled maize grain, and from 5.2 to 18.3% in dehusked cobs during 3 months of storage. *Rattus rattus* was the only rodent species captured over the whole trapping period with a trap success rate of 0.62 -10%. Total mould count and *Fusarium* spp. incidence were significantly higher in rodent-damaged grains than in the non-damaged ones ( $P=0.001$ ;  $P=0.011$ , respectively), whereas no significant difference was observed for *Aspergillus* spp. incidence ( $P=0.239$ ) and total aflatoxin contamination ( $P=0.077$ ). Contents of methionine, valine, proline and all fatty acids were significantly lower in the rodent-damaged grains.

## **Postharvest losses of agricultural commodities in Trincomalee, Sri Lanka**

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## Abstract

In Sri Lanka, postharvest losses vary with the geographical area; higher losses are reported in warmer areas. A survey was conducted in Trincomalee district, one of the hottest areas in Sri Lanka, to ascertain the status of crop cultivation and postharvest losses of cultivated crops. Farming is the main livelihood of the people in the area. The main crops cultivated are paddy, red onion, chili, brinjal, tobacco and manioc; the average land extent possessed by a farmer family and the yield varies with the crop. Paddy, onion, and tobacco are stored for 6, 3, and 12 months, respectively. Paddy is stored indoor in bags, onion as racks (indoor), and tobacco as piles (indoor and outdoor) under shade conditions. During harvest, drying and storage losses occur in paddy and onion. *Sitophilus oryzae*, *Rhyzopertha dominica*, *Sitotroga cerealella*, and rats are the major problems during paddy storage. Pesticides are not used regularly by the farmers. Instead they practice traditional pest management methods.

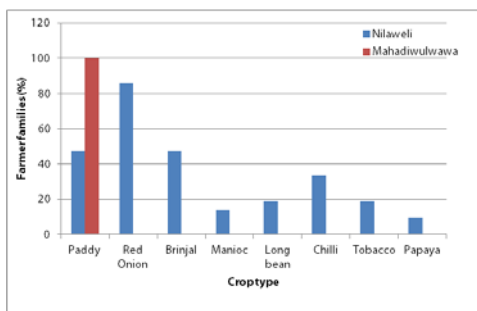
## 1. Introduction

Postharvest losses of agricultural commodities are much higher in the tropics (Wijayaratne et al., 2018). Insects are major cause for these losses (Hill, 1990). Trincomalee is located in the northeast area of Sri Lanka, and belongs to the dry zone. Due to the limited availability of water, crop cultivation in this region is mainly seasonal. The harvested yield is stored for consumption during the off seasons. Despite the high postharvest losses of agricultural commodities in Sri Lanka, a detailed study has not been conducted recently in Trincomalee area. Therefore, this survey was conducted to determine the status of crop cultivation and postharvest losses of cultivated crops in two cropping areas in Trincomalee, Sri Lanka.

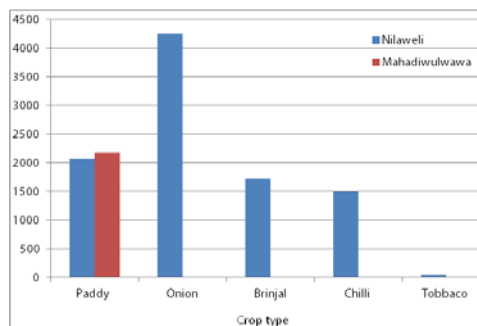
## 2. Materials and methods

Two geographical areas in Trincomalee district having storage practices, Nilaweli and Mahadiwulwawa, were selected for the study. From each location, 21 families were selected. Using a questionnaire, information on crop growth and postharvest practices were gathered.

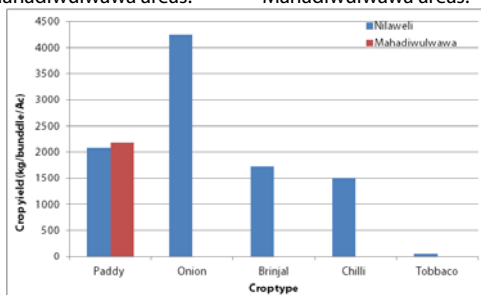
## 3. Results



**Fig. 1.** Crop cultivation (as a percentage of all families) in Nilaweli and Mahadiwulwawa areas.



**Fig. 2.** Annual crop yield (kg) in Nilaweli and Mahadiwulwawa areas.



**Fig. 3.** Post-harvest losses in Nilaweli and Mahadiwulwawa areas.

Several economically-valuable crops are grown in Nilaweli area whereas paddy is the only economically valuable crop in Mahadiwulwewa area. Most of the families in Nilaweli area tend to grow red onion. As a crop grown in the two areas surveyed, the highest annual yield is obtained from onion cultivation. Yield losses during storage happen due to stored-product insects, rodents, and unfavorable conditions of food stores.

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### Abundance of insects in rice mills in Polonnaruwa, Sri Lanka

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### Abstract

Monitoring of insect population is a prerequisite for integrated pest management attempts. The complex structures/machines in rice milling facilities, however, limit surveying attempts aggravating the ignorance of insect fauna associated with such facilities. Furthermore, insect surveys conducted in Sri Lanka are very rare. The objective of the current study was to determine the presence, diversity, and abundance of insects in rice mills of varying capacity as found in a major rice processing area in Sri Lanka. A group of large-, medium-, and small-scale mills were used for the survey. Samples were collected from different locations in the mills, and the density of insects at each location was determined. Insect species and their abundance varied with the type of mill as well as with the location in the mill. This information is useful to design and implement pest management for the mills.

**Keywords:** small scale, medium scale, large scale, abundance, insect

### 1. Introduction

Rice is the staple food of Sri Lankans. In Sri Lanka, the annual paddy production in 2015 in one season was 1.9 million MT. Of this production 14% is from Polonnaruwa district (Department of Census and Statistics, 2015). Furthermore, rice milling is popular in Polonnaruwa area. Insects in rice mills are a challenge as they cause quantitative and qualitative losses in the milling products (Hagstrum and Subramanyam, 2006; Wijayarathne et al., 2018). However, lack of information on insect pest populations and their diversity in rice milling facilities restrict the development of integrated pest management programs. No proper survey has been conducted in rice mills in Sri Lanka on the presence of insects. Therefore, this survey was carried out to determine the presence, diversity, and abundance of insects in rice mills in Polonnaruwa district, Sri Lanka.

### 2. Materials and Methods

Using a questionnaire, information was collected from large-scale, medium-scale and small-scale rice mills on the abundance of insects and their diversity. Samples from different parts of the mill were collected: store house, rice polishers, destoner, dehusker, separator, silky machine, grader,