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Short Communication

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Cross border technology transfer-A case study with TNAU trapping technologies in Gondar, Ethiopia, Africa for the management of stored product insects

Amsalu Debebe[1], S.Mohan[2]*, S.Kuttalam[2], Raja Nagappan[1]

[1]Department of Applied Biology, University of Gondar, Ethiopia, Africa

[2]Department of Agricultural Entomology, Tamil Nadu Agricultural University, Coimbatore-641 003, Tamil Nadu (INDIA)

E-mail : sarmamohan@hotmail.com

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ABSTRACT

Timely detection of stored grain insects using behavioural tools like probe traps, pit fall traps, pulse beetle traps etc., play a great role in managing these insects. Tamil Nadu Agricultural University, Coimbatore, India being one of the pioneering institutes in the world, made attempt to introduce these tools in Ehtiopia, Africa where these insects are considered to be important in the food and nutritional security. The results showed the usefulness of these tools in monitoring and management of stored grain insects in Ethiopia farms too.

KEYWORDS

Rice weevil;
Pulse beetle;
TNAU traps;
Management;
Gondar;
Ethiopia.

INTRODUCTION

Stored product insects cause both quantitative and qualitative loss to harvested grains during storage with losses higher in developing and under developed countries[3,5]. Many stored product insects are good fliers. Hence they fly from store houses and infest the crops in the field during pre-harvest stage itself. As a result harvested produce contain immature stages of insects which emerge as adults during storage. Timely detection of these adults in storage is important to take up appropriate management strategies, as these field carried over population form the potential source of inoculum for further build up in storage. In this context attempts were made earlier to develop suitable devices which can help in predicting the timely emergence of insects using insect wandering behaviour[4,6,7]. Tamil Nadu Agricultural University (TNAU) Coimbatore, India under TNAU–McGill Canadian International Development Agency Project on "Consolidation of food security in South India" attempted to transfer the technologies on TNAU Insect traps for stored product insects in the African continent where the stored product insects are of serious concern in the food and nutritional security[1,2]. Though the products (TNAU traps) were a great hit among Indian farmers, an international application for the same was not explored so far. Hence the present attempt. Two tests were conducted one laboratory test and one on farm test as detailed below in the Gondar region of Ethiopia.

1. Laboratory Test

Place – Department of Applied Biology, University of Gondar, Ethiopia, Africa

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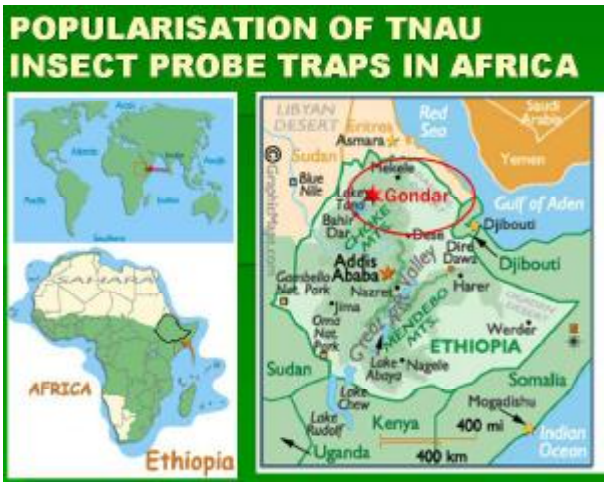

Commodity – Wheat

Test Insect – granary weevil or maize weevil or wheat weevil *Sitophilus granarius* (Linnaeus)
(Coleoptera : Curculionidae)

Environmental conditions – Altitude – 2100mt a.s.l.
Max. temp. – 24°C
Min. temp. – 10°C

Study Period – 60 days

Design of the experiment

Factors- 2 Traps and Density (damage)
1. Traps – Probe trap – Long (12 inch) and Short (6 inch)
2. Density – 10, 20, 30 insects/bag
(Contents of each bag = 20 kg wheat)

Replications - Three

Treatment details

T1 - Probe trap long : 10, 20, 30 insects / bag
T2 - Probe trap short : 10, 20, 30 insects / bag
T3 - Control (without trap) : 10, 20, 30 insects / bag

Data recorded- At the end of the experiment damage by weevil was estimated and expressed as percent damage in all the treatments.

Treatment Details	Mean per cent damage*
Probe trap long : 10 insects / bag	0.3933[a]
Probe trap long : 20 insects / bag	0.4867[a]
Probe trap long : 30 insects / bag	0.9100 [b]
Probe trap short : 10 insects / bag	0.1800[a]
Probe trap short : 20 insects / bag	0.3633[a]
Probe trap short : 30 insects / bag	1.1233[b]
Control (without trap) : 10 insects / bag	3.3933[c]
Control (without trap) : 20 insects / bag	4.4233[d]
Control (without trap) : 30 insects / bag	6.9400[e]

***Means followed by different letters are significantly different by Duncan's multiple range test (P = 0.05)**

Inference

Probe traps long (or) short proved to be good management strategy for insect control in stored wheat.

2. Field (On-farm) test

Type of trap : Two-in-one model pulse beetle trap
Commodity : Pulses (Chickpea, peas, beans)
Pest species : Bruchids
Premises considered : Farmers - 3
: Retailers - 3
Period of study : 45 days
Damage (%) : Recorded in the holdings at the end of the experiment

Observation

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TNAU Traps in African farmers' holdings

Particulars	% damage by bruchid after experimental period (Mean)*
Farmers (with traps)	5.5
Farmer (control without trapping)	13.1
Retailers (with traps)	1.5
Retailers (control without trapping)	5.5

***Simple percentage analysis**

Inference

TNAU two in one model pulse beetle trap proved to be a good indicator for timely detection of bruchids in stored pulses at farm/retail outlet level. There is also a reduced damage by pulse beetle in the TNAU trapping experiments to a tune of 7.6% at farm level and 4.0% at retailer level.

On observing the above results TNAU had decided to examine the possibility of extending the use of the TNAU-developed stored grain insect trapping technologies across the world wherever stored grain insects are of serious concern for food security as well as nutritional security.

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