NOVEL APPROACHES IN THE MANAGEMENT OF STORED PRODUCT INSECTS

Dr. S. MOHAN M.Sc.(Ag.), Ph.D.,
Professor of Agrl. Entomology
Tamil Nadu Agricultural University
Coimbatore – 641003, Tamil Nadu, India

- INTRODUCTION
- LOSS BY STORED PRODUCT INSECTS
- NOVEL METHODS
- IMPACT
- CONCLUSION

INTRODUCTION

Stored product Pests

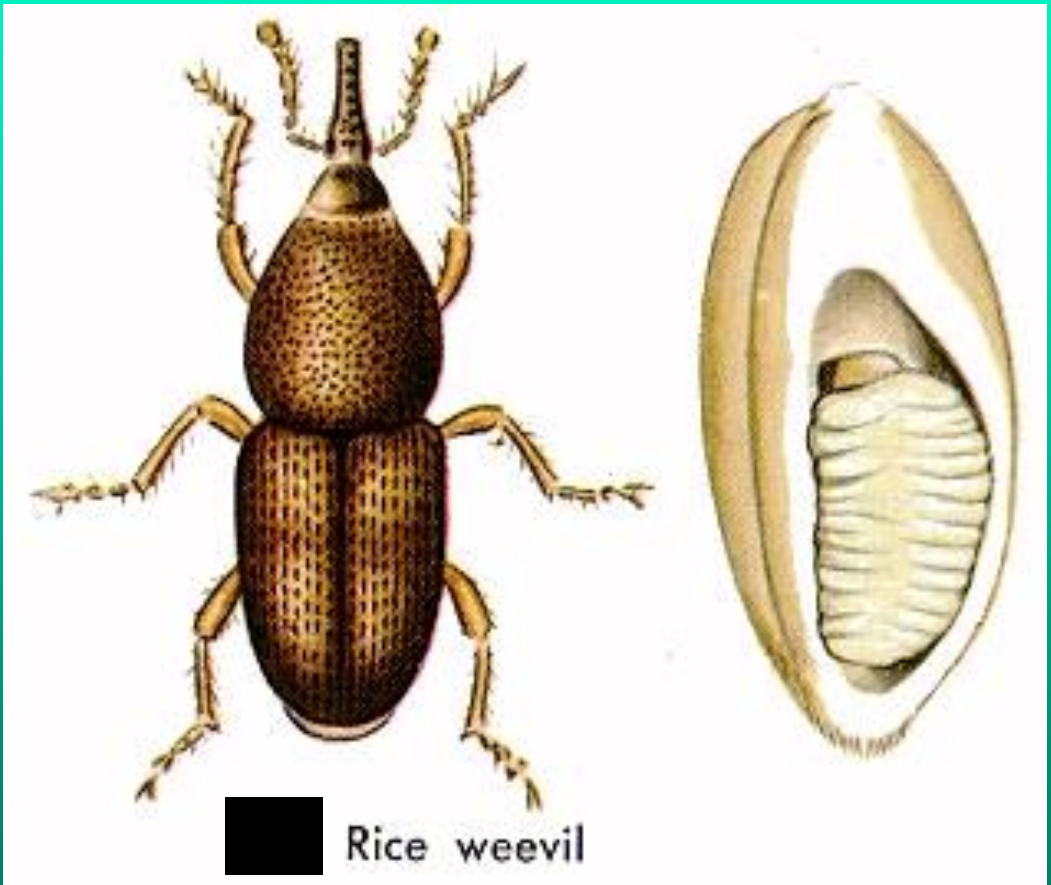
- **Internal feeders**
- **External feeders**

Storage losses in food grains

Insects	2.50 %
Rodents	2.50 %
Birds	0.85 %
Moisture	0.68 %
Total	6.53 %

(Maseeh, 1990)

Rice weevil (*Sitophilus oryzae*) Curculionidae, Coleoptera



Rice weevil (*Sitophilus oryzae*) Curculionidae, Coleoptera

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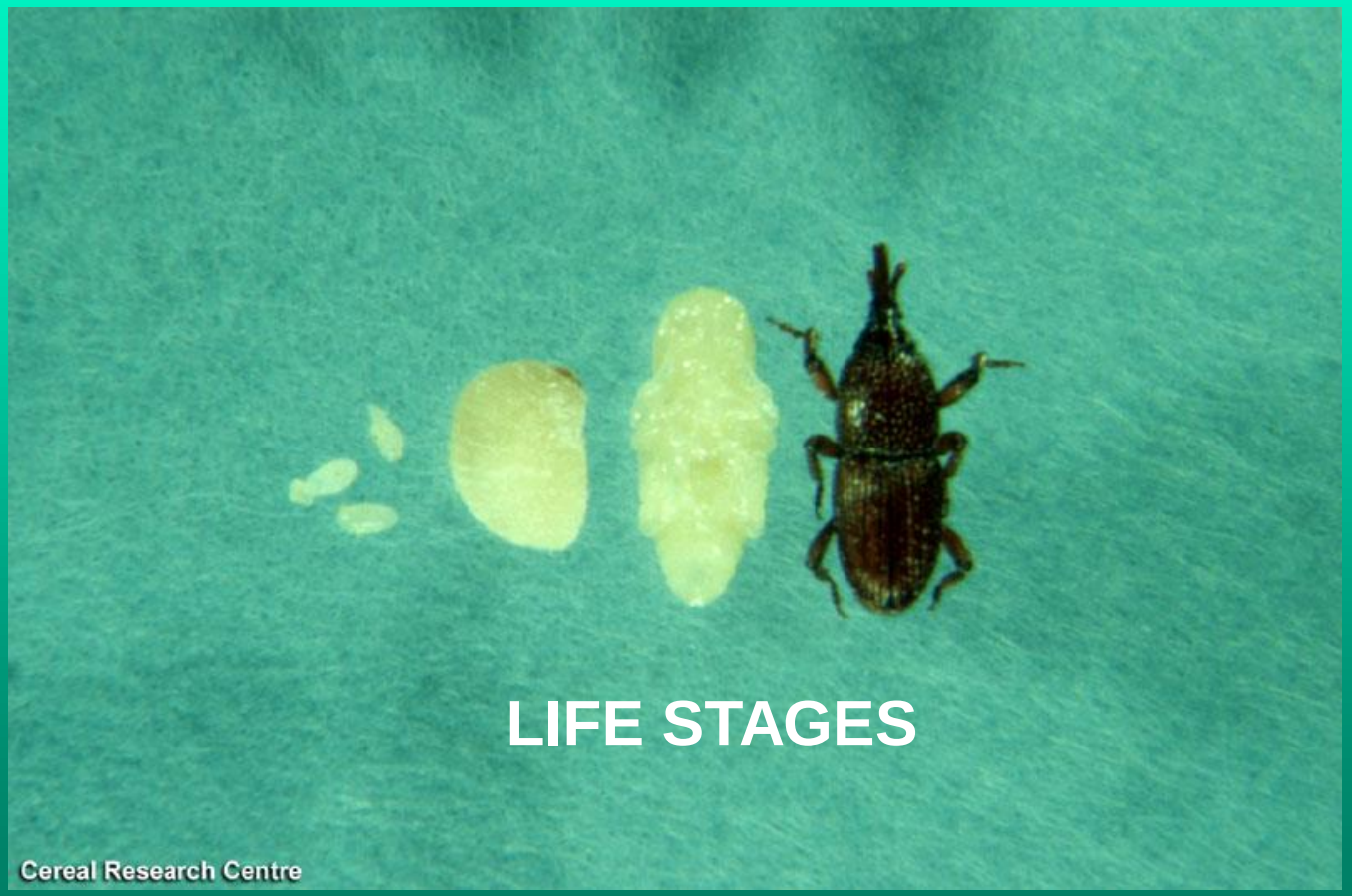
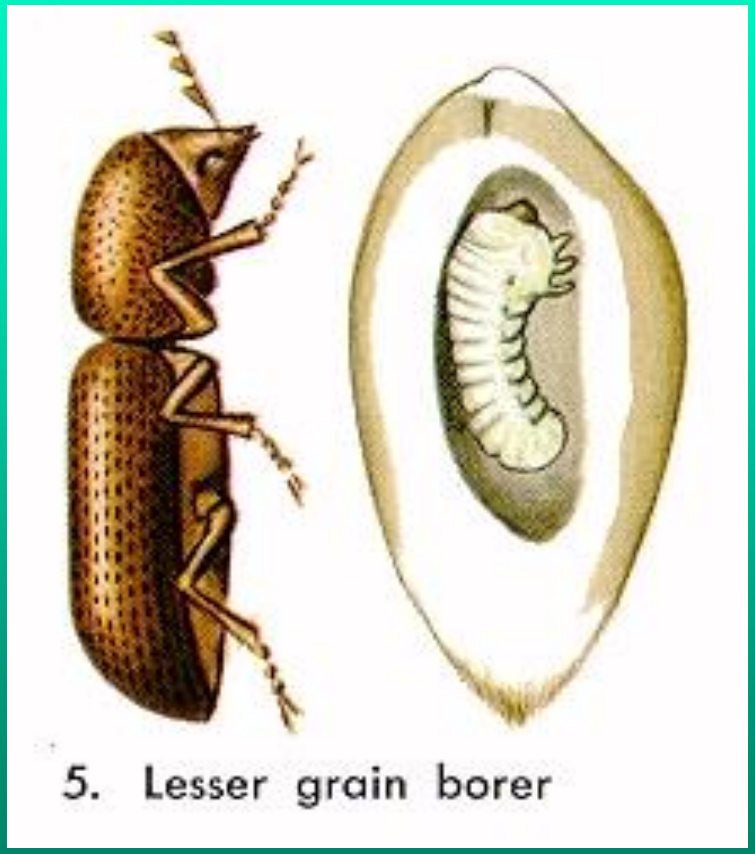


Lesser grain borer, (*Rhizopertha dominica*) Bostrychidae, Coleoptera



5. Lesser grain borer

Lesser grain borer, (*Rhizopertha dominica*) Bostrychidae, Coleoptera

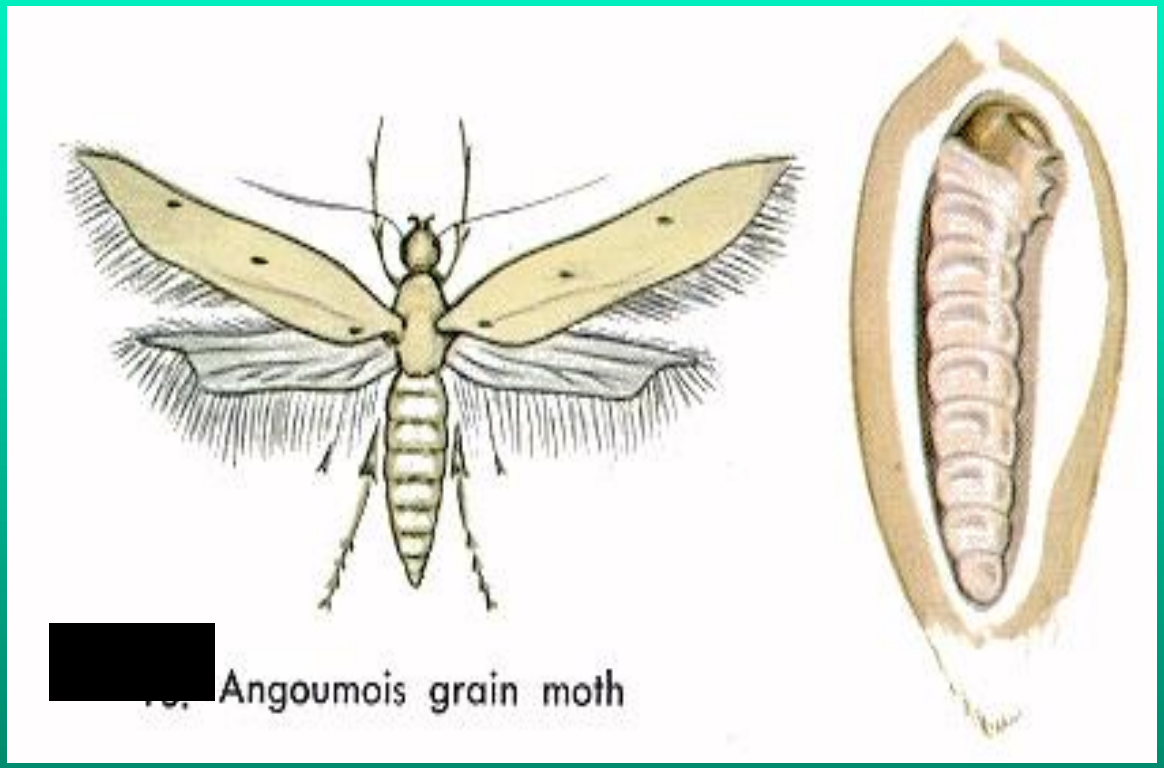
Lesser grain borer, (*Rhizopertha dominica*) Bostrychidae, Coleoptera

Pulse beetle, (*Callosbruchus chinensis*, *C.maculatus*), Bruchidae, Coleoptera

Drug store beetle (Stegobium paniceum), Anobiidae, Coleoptera

Groundnut bruchid (*Caryedon serratus*) Bruchidae, Coleoptera

Angoumois grain moth (*Sitotroga cerealella*, Gelechiidae, Lepidoptera)



Red flour beetle (*Tribolium castaneum*, *T.confusum*, Tenebrionidae, Coleoptera)

Saw toothed grain beetle (*Oryzaephilus surinamensis*, Silvanidae, Coleoptera)

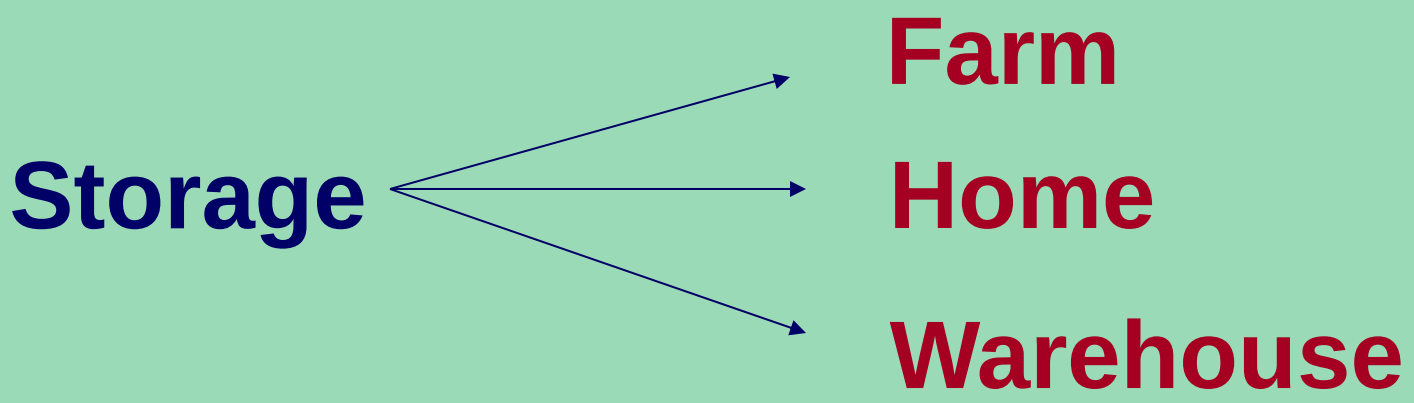
Rice moth (*Corcyra cephalonica*, Galleridae, Lepidoptera)

CURRENT STATUS

“No Granaries can be filled with grain without insect in country like ours” - because of

- **Field carry over infestation**
- **Cross infestation**

What is happening now ?



- Traditional practice at farm level - Sun drying
- Two-third of our grain production in farm and one-third only to Public Distribution System

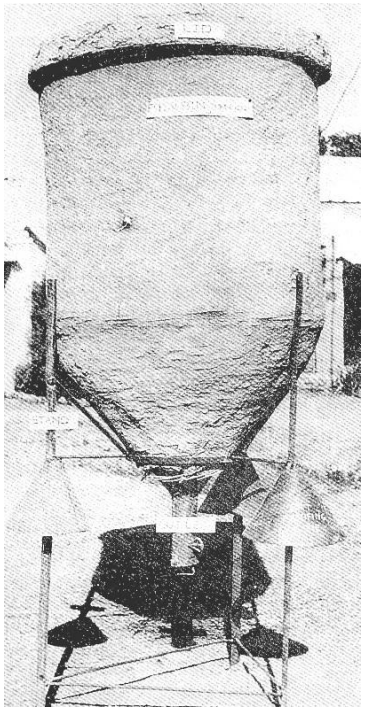
Chittore bin

Made of stone slabs

Bamboo bin

Double walled

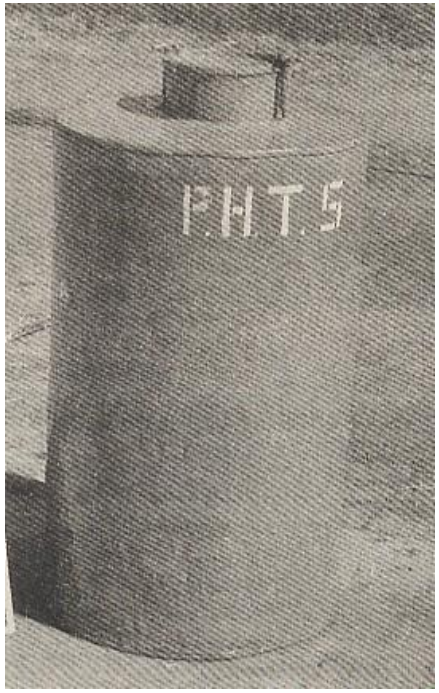
Polythene lined

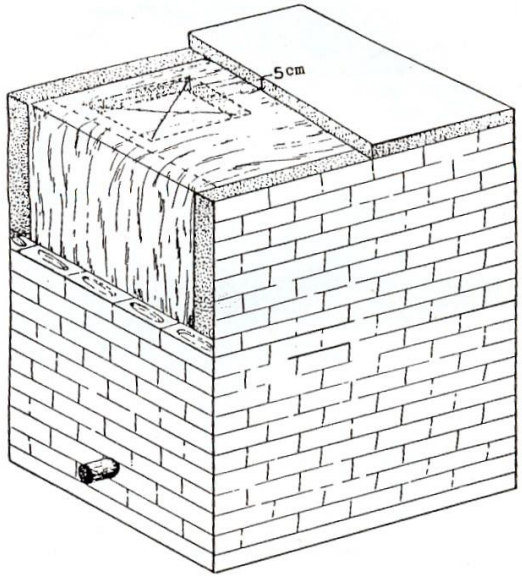


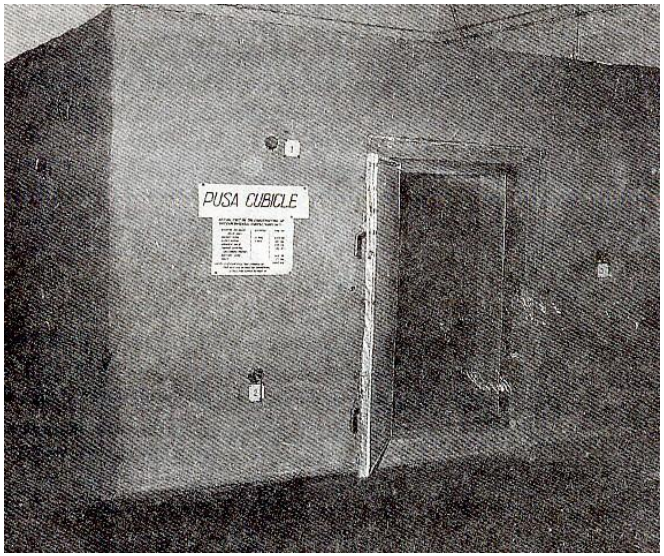
Improved PKV bin

Green bamboo splits +

Mud plastering







Udaipur Coal tar Drum bin

Pusa bin

Pusa Cubicle

Gunny bag storage

Storing in wooden and metal bins

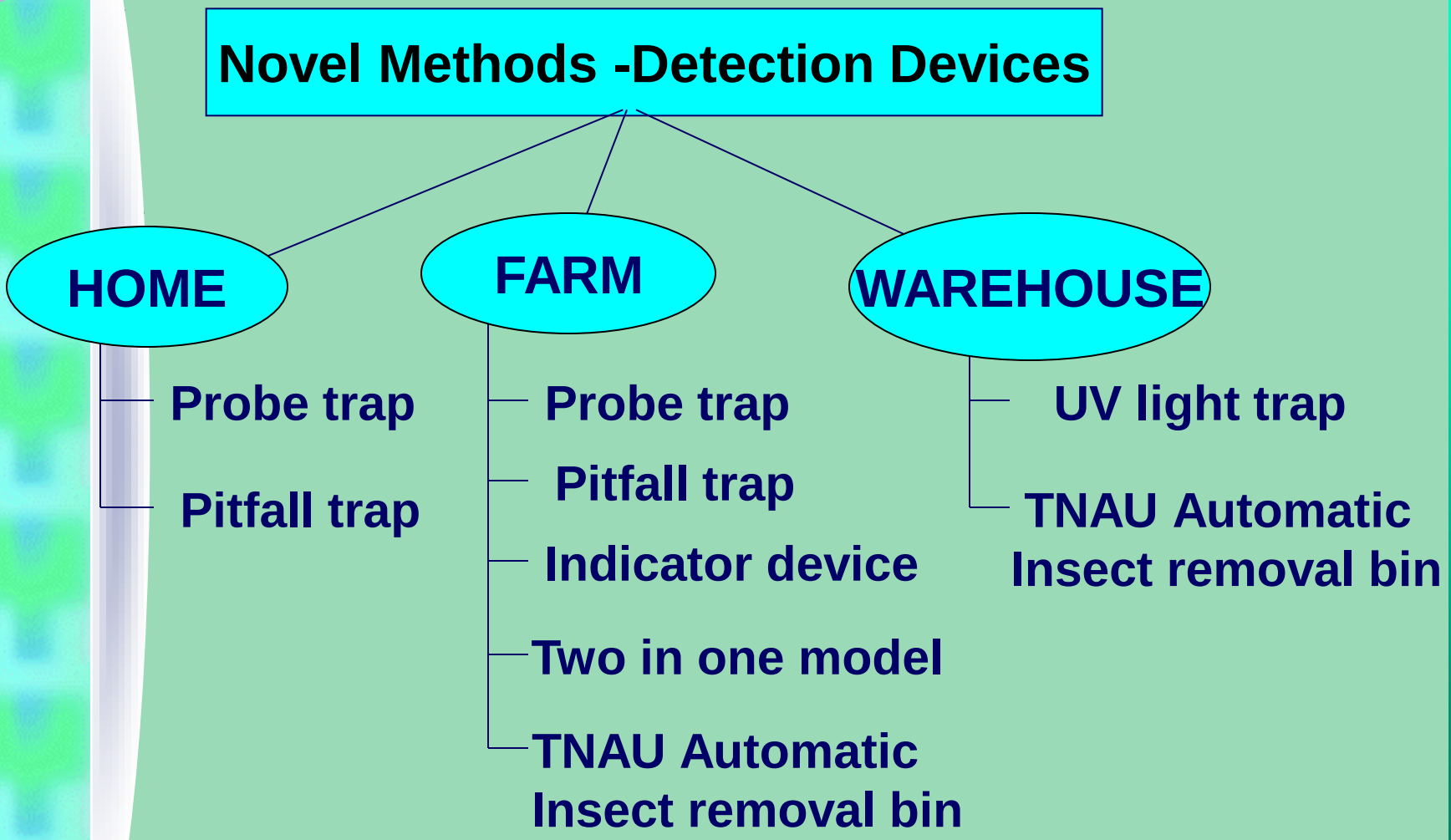
Mud pots for storage of minimum quantities like seeds

Wooden boxes for storing grains

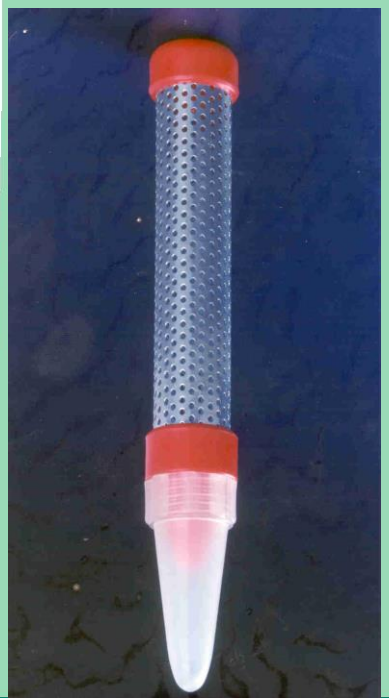
Importance of early detection of insect infestation in food grains

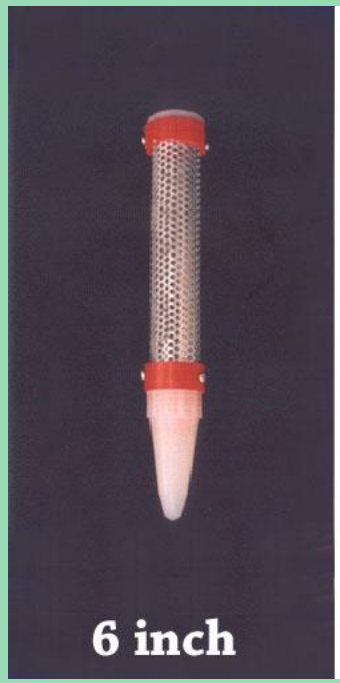
- Insect population density greater than 1/kg = serious potential risk in storage
- Zero Tolerance Limit
- If not detected early total loss within 4 months of storage

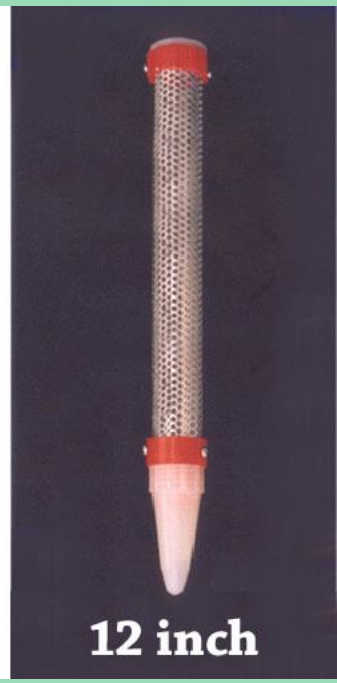
Novel Methods -Detection Devices



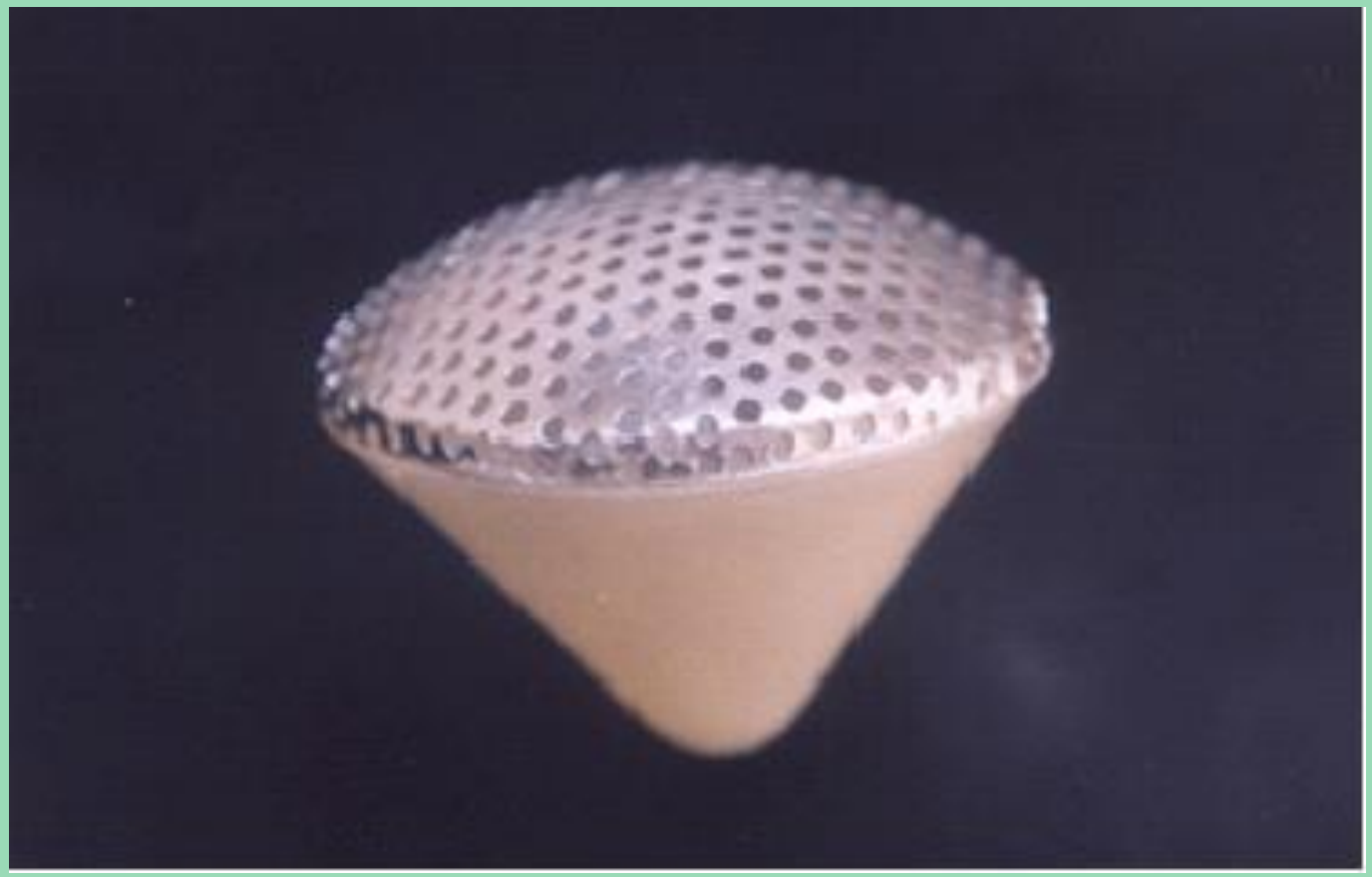
TNAU Probe Traps



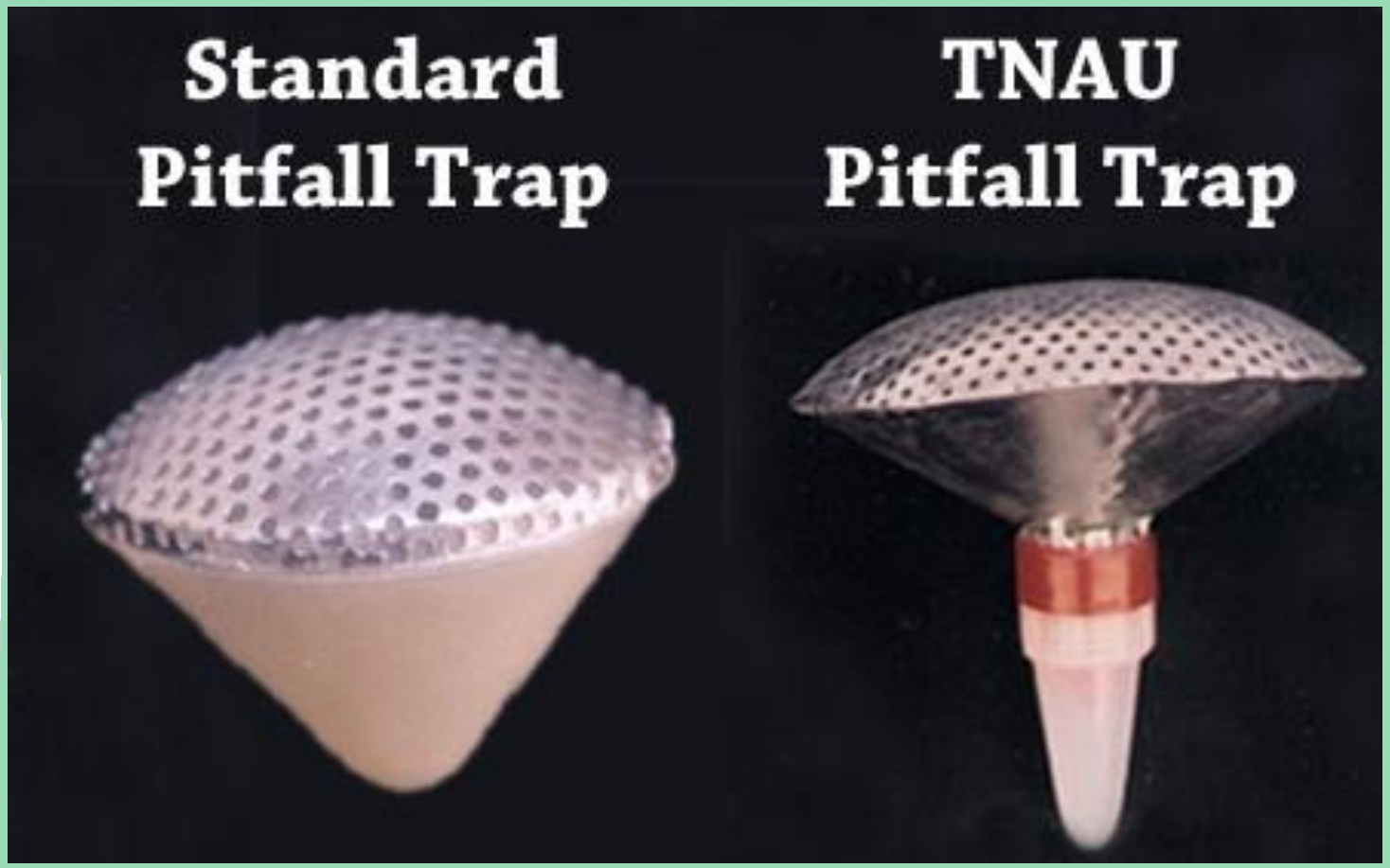




PITFALL TRAP

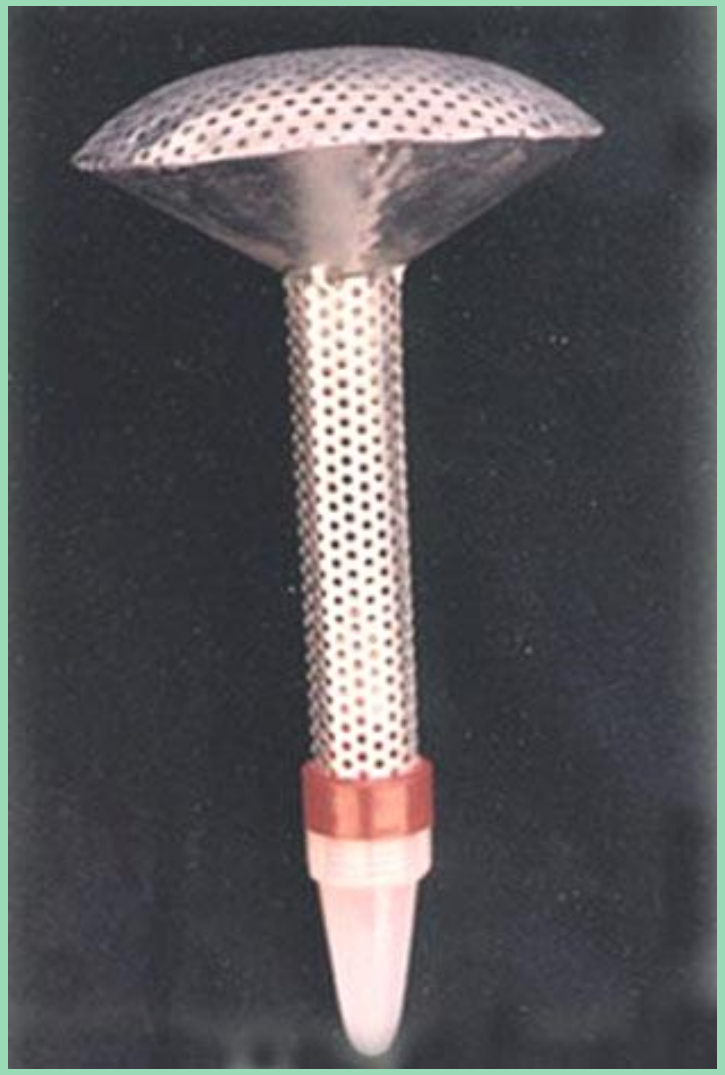


PITFALL TRAP



TNAU PITFALL TRAP – Commercial Model

TWO IN ONE MODEL



INDICATOR DEVICE

TNAU AUTOMATIC INSECT REMOVAL BIN

Prototype of insect removal bin

Parts of the bin model

TNAU AUTOMATIC INSECT REMOVAL BIN

25 kg capacity

100 kg capacity

500 kg capacity

UV LIGHT TRAP

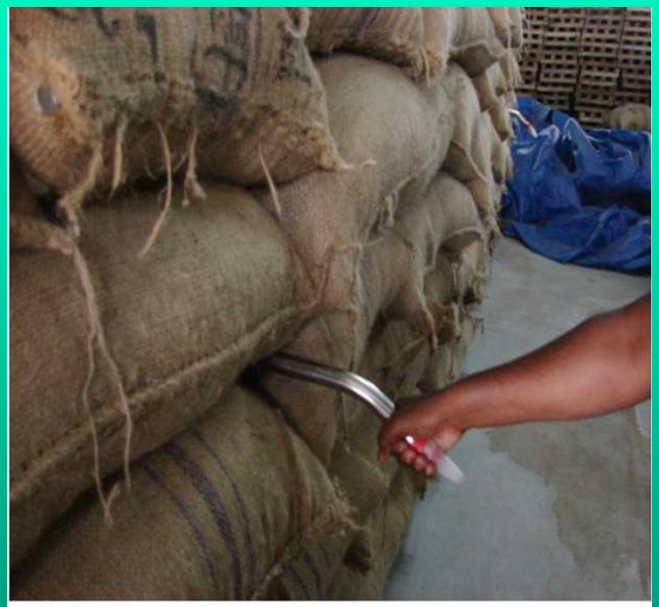
(Mohan, 1993)

New model UV light trap

b) UV light trap

TNAU stack probe trap
(India patent application No. CHE/1773/2008)

a) stack probe trap



b) Placement of stack probe trap

TNAU insect egg removal device (Indian patent 198434)

TNAU STORED GRAIN INSECT MANAGEMENT KIT (NEW VERSION)

TNAU Insect Probe Trap

Indicator Device

TNAU Pitfall Trap

UV light trap for Grain Storage Godowns

Pulse Beetle Trap (TNAU Two-in-one Model)

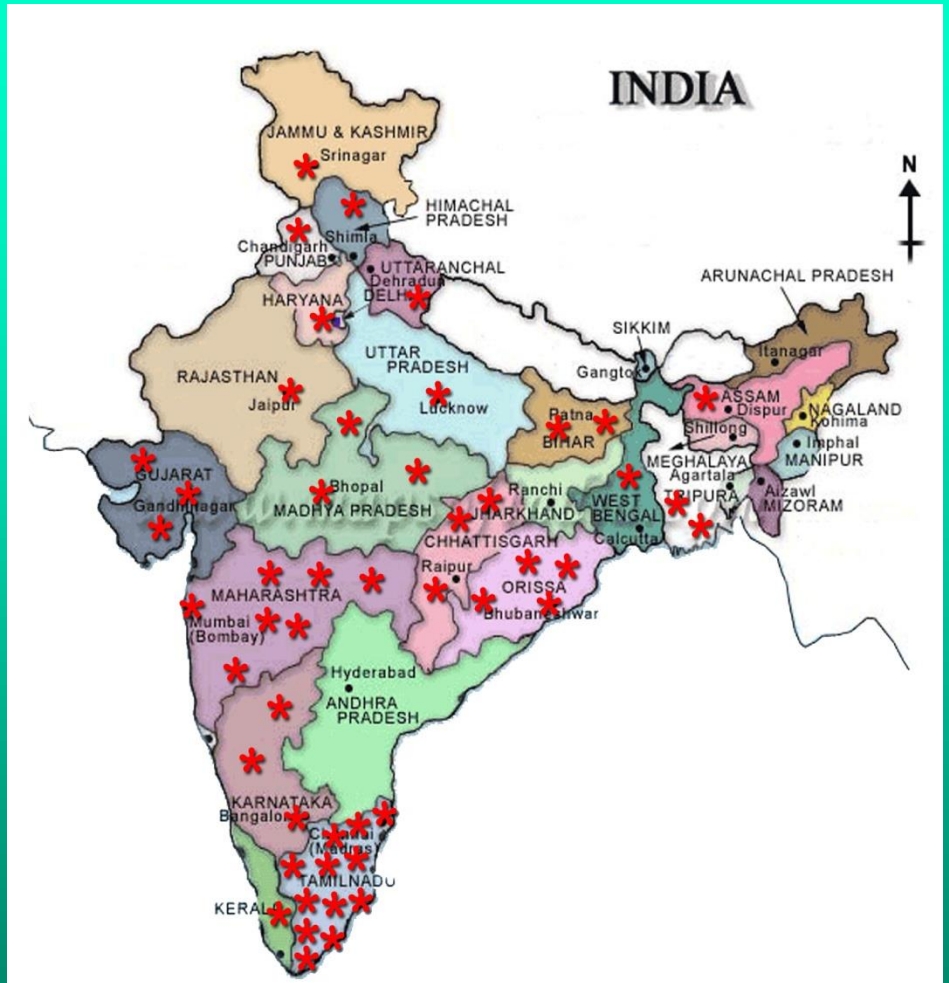
Automatic Insect Removal Bin

Stack Probe Trap

TNAU Insect Egg Remover

For technical details : The Director, **Agri-Business Development**, Tamil Nadu Agricultural University, Coimbatore – 641 003.
Phone : 0422-6611377(D), 0422-6611310(O), Fax : 0422-6611399. Email : business@tnau.ac.in, psivasubramanian2003@yahoo.co.in
Website : www.tnau.ac.in / www.agritech.tnau.ac.in
For Commercial Details : **M/s Melwin Engineering**, 18/2, Gandhi Street, Bharathi Nagar, Podanur (PO), Coimbatore – 641 023.
Email : anitathomascs10@email.com Ph : 94421 28170.

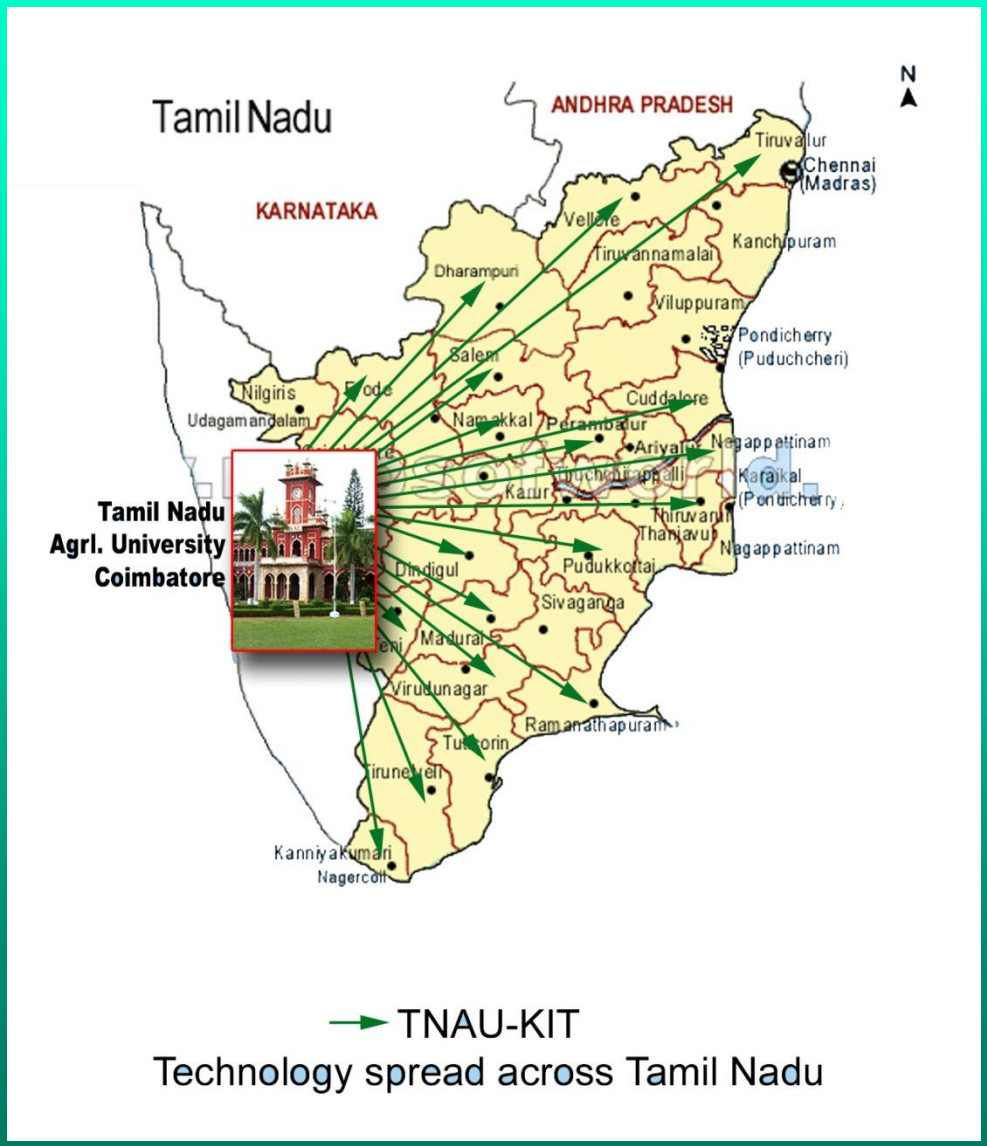
TNAU-KIT technology spread across the Country



* TNAU-KIT

Technology spread across the country

TNAU-KIT technology spread across Tamil Nadu



Recent Invention – Insect Egg Removal Device

Indian Patent No. 198434

Trap for monitoring stored product insects in warehouse (Patent Application No.1733/CHE/2008, dt.24.7.2008)

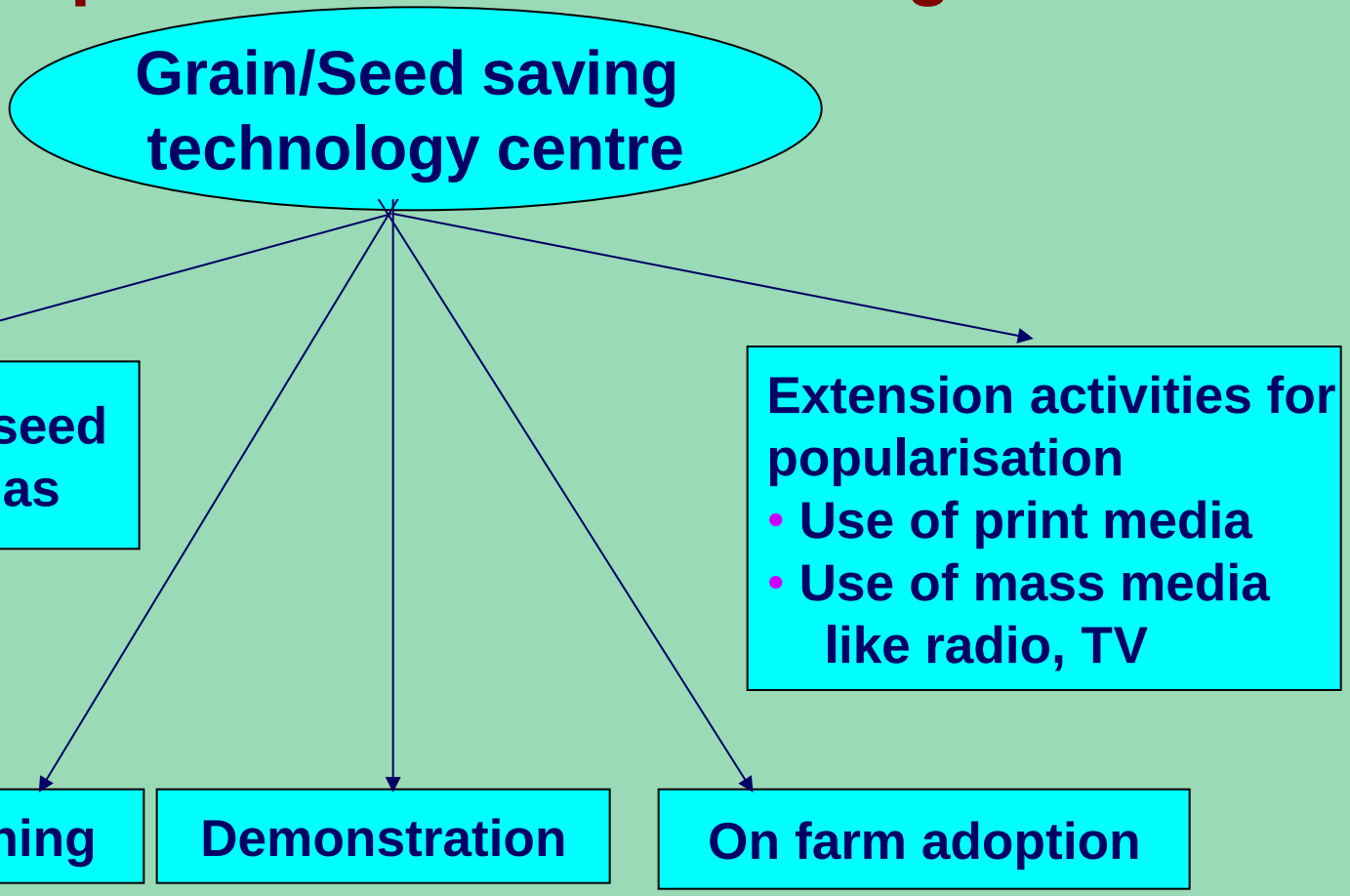
RESULT

- Timely detection using the devices will help in timely control operation
- Prevents multiplication of stored product insects at all levels of storage

TECHNOLOGIES COMMERCIALISED

- TNAU –Probe trap
- TNAU – Pitfall trap
- Two in one model trap
- TNAU -Automatic insect removal bin
- Indicator device
- UV –Light trap
- TNAU Kit Box
- Egg removal Device

Popularization of Technologies



Agencies -State Dept. of Agriculture
SAU`S, ICAR and NGOs

IMPACT OF TNAU PROBE TRAP TECHNOLOGY IN TRIBAL REGION OF ADILABAD (ANDHRA PRADESH) by NGO - BASIX

- Reduced drudgery
- Reduced wastage of grains (3-5 kg / 4 months)
- Rs.20 to 30 saved
- Cost effective – Eco friendly
- Easy tool for cleaning grains

IMPACT OF TNAU PROBE TRAP TECHNOLOGY IN GORAKHPUR Dt. of UTTAR PRADESH by TATA KRISHI VIKAS KENDRA

- Chemical free
- Long lasting
- No side effects
- Beneficial, if used from the beginning the trap can be a control device

IMPACT OF TNAU PROBE TRAP TECHNOLOGY IN COIMBATORE Dt. of TAMIL NADU by TNAU McGill CIDA Project

- Chemical free
- Long lasting
- No side effects
- The only adaptable method
- Saves 3-5 kg for four months
- Cost effective
- Highly suitable for bin storage

IMPACT OF TNAU PROBE TRAP TECHNOLOGY IN COIMBATORE Dt. of TAMIL NADU by TNAU McGill CIDA Project

IMPACT ON SOCIETY

- 2.5 lakh people using the TNAU trap
- 200 SAU's/ KVK's using the TNAU Stored product insect management kit for teaching and training.
- Introduction of TNAU Trap in Africa.
- kindering the scientific temper of school children which led them to make TNAU Traps in plastic waste water bottles, which got them National and International awards.
- Making TNAU Trap techonology as part of 11th std vocational Education curriculum in Tamil Nadu Schools which is being studied by around 25,000 students every year.

Name of the Firms/Exporters who use the trap
M/s Madaus Pharmaceuticals PVT. Ltd. Goa, India
M/s Saraf Trading Corporation PVT. LTD, Cochin, India
M/s SKM Siddha and Ayurvedic, Tamil Nadu, India.
All Maha Foods International Pvt Ltd, Jasola, New Delhi.
Cadburys India Ltd., Dharapuram, Tamil Nadu, India.

AWARDS for TNAU–TRAP TECHNOLOGY

Impact on Students

Both Myself (Dr. S. Mohan) and my student received the Jawaharlal Nehru Award for our work on stored product insect management

JAWAHARLAL NEHRU AWARD (ICAR)

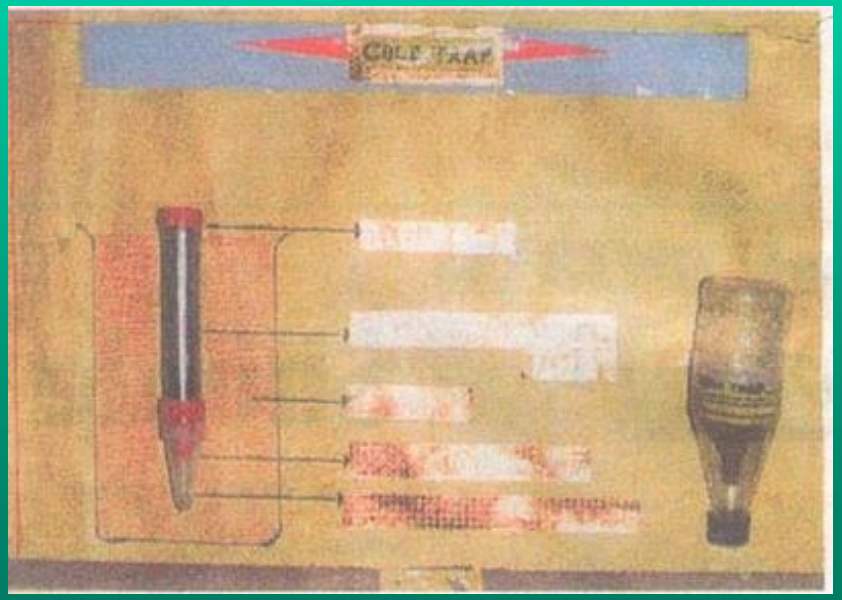
GUIDE (DR. S. MOHAN) - 1994)

HONOURED: Union Minister of State for Agriculture, Shri.Kanti Lal Bhuria, presented Jawaharlal Nehru Award to Dr. P. Pretheep Kumar at the ICAR Award Ceremony held at New Delhi on August 18, 2006

My student (Dr. P. Pratheep Kumar) - 2005)

IMPACT OF TRAP TECHNOLOGY ON SCIENTIFIC TEMPER OF SCHOOL CHILDREN

THE HIDDEN TALENTS



Farmers Innovativeness based on TNAU Probe trap

கூரிய ஊசியால் துவாரமிட பழுக்கக் காய்ச்சுதல் (மெழுகுவர்த்தி சுடரில்)
Making perforation for insect entry using needles neated up

காய்ச்சிய ஊசியின் முனையால் வரிசையாக துவாரங்களை பிளாஸ்டிக் பாட்டில்களில் ஏற்படுத்துதல்
Making perforation with heated needles

பத்தாயத்தில் நெல்லில் புதைக்கப்பட்ட பிளாஸ்டிக் பாட்டில்கள்
Placement of trap in stroage structure

கவிழ்த்து வைக்கப்பட்ட பாட்டில்களின் கூம்பு வடிவ பகுதியில்
Storage pest collect ஆனதும் வெளியில் எடுக்கப்படுதல்
Removing the trap from Patthayam

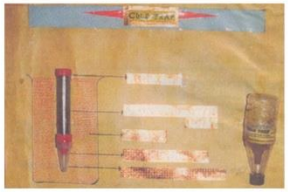
Trap செய்யப்பட்ட பூச்சி Bottle உடன்
Bottle with trapped insects

பத்தாயத்தின் அருகில் எனது பணியாளர் பூச்சிகள் trap செய்யப்பட்ட Trap உடன்
Traps ready for placing in Patthayyam

ஒரு பாட்டிலில் சேகரித்த Storage pest குவியல்
Insects trapped from a single trap

MY INVENTION KINDERED THE SCIENTIFIC / INNOVATIVE TEMPER OF SCHOOL CHILDREN

A beginning in sowing seeds of innovativeness / creativity in the minds of children for liberating them from illiteracy



School children from Dharmapuri,Tamil Nadu makes trap from waste plastic bottles (Idea came from my inventions)

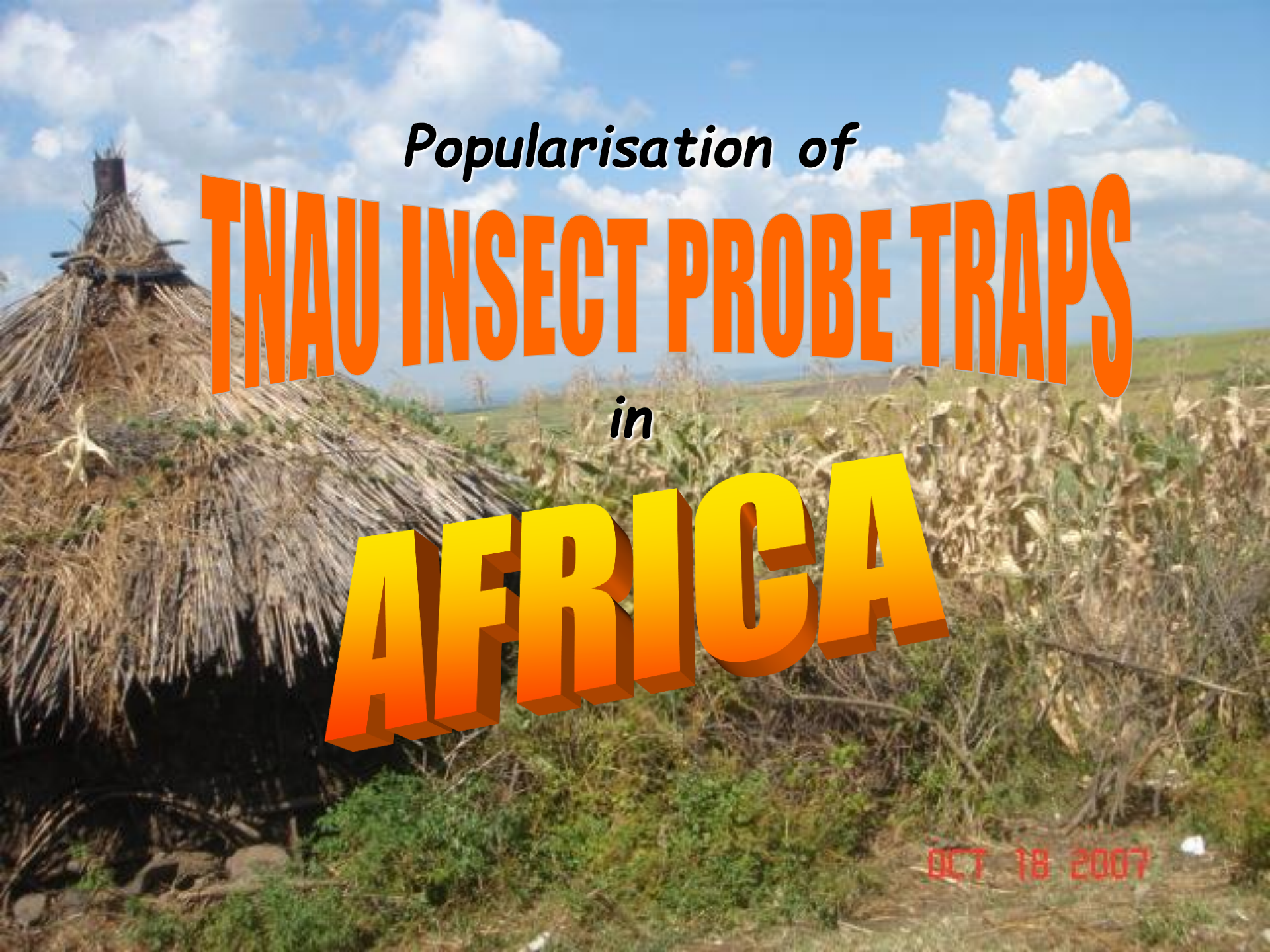
School children from Gopichettipalayam, Erode, Tamil Nadu uses my idea on traps

A school childrens from Trichy creats record by winning 2 gold medals from IRIS (Intel) competition by using waste plastics for my making traps invented by myself

CONCLUSION

FOOD WITH HUMAN DIGNITY - A SIGNIFICANT APPROACH

- A Grain/seed saved is a grain/seed produced
  Saving grain should start from every house
  Consume Good grain without contamination
- Every individual - Right to adequate healthy food &clean drinking water - basic right
- Shift of Emphasis from food security at the household level to nutritional security at the level of each individual


Popularisation of
TNAU INSECT PROBE TRAPS
in
AFRICA
OCT 18 2007

POPULARISATION OF TNAU INSECT PROBE TRAPS IN AFRICA

I. Field (On-farm) Test

Type of trap	**: Two-in-one model – Long or Short**
Commodity	**: Pulses (Chickpea, peas, beans)**
Pest species	**: *Bruchids***
Premises considered	**: Farmers – 3**
	: Retailers – 3
Period of study	**: 45 days**
Observation	**: Trapping of insects recorded every week**
Damage (%)	**: Recorded in the holdings at the end of the experiment**

TNAU Traps in African farmers' holdings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PROTECT YOUR HEALTH AGAINST URIC ACID CONTAMINATED GRAINS
TNAU
INSECT TRAP
Chemicals. No Side effects. No Battery. No Maintenance.
TAMILNADU AGRICULTURAL UNIVERSITY, COIMBATORE
AVAILABLE HERE
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On-farm Results

Premises	Total number of Bruchids trapped		Per cent Bruchid damage (Range)
	Short	Long	
Farmer 1	52	93	6.00 to 7.00
Farmer 2	33	59	5.00 to 7.00
Farmer 3	120	171	9.00 to 11.00
Retailer 1	24	35	2.00 to 4.00
Retailer 2	22	36	1.00 to 2.00
Retailer 3	36	47	3.00 to 4.00

AWARDS for TNAU-TRAP TECHNOLOGY

"A grain saved is a grain produced,
A seed saved is thousands produced".


Thank you