

# **INSECT PEST CONTROL & INTEGRATED PEST MANAGEMENT**

**By**

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# INTRODUCTION

.Any small air breathing arthropod of the class insecta having a body divided into head, thorax, & abdomen, three pairs of legs , and two pair of wings ,two anteny is called insect.

Amongst 20 phylum of animal kingdom, Arthropoda is the biggest one and comprises the class insecta, which is the largest and complicated group of insect. It is estimated that there are more then 12 lakhs animal species exit in the world and out of these species nearly 7- 8 lakhs fall under the class insecta.

Insecta are causing damage to seeds , nurseries ,plantation, natural forest and stored timber in various ways, including defoliation, phloem and wood boring to seed, cone, buds, shoots, roots, gall formation. All of these separately and cumulatively affect the forest productivity and great degrees of economic losses.

# INSECT PEST

This little critters usually eat more then you and me put together. Mulching is one way to help control them. The best way that helps control pests are to rotate your crops to different areas. Checking out your plants daily will help you learn to recognize a lot of pests. ....



# INSECT PEST CONTROL

With the management of forests systematically through sound silvicultural forestry practices and scientifically evolved control strategies against various forest pest, the term 'pest control' in forestry (as also in allied agricultural and horticultural sciences) has undergone a great deal of metamorphosis both in concept and scope and has been defined variously by different authorities within the framework of their perceivment.

# CLASSIFICATION OF FOREST INSECT PEST CONTROL

## A. Natural control

### Components

1. Climatic control

Meteorological factors:- Temperature, rainfall, atmospheric pressure wind, topographic features

2. Biotic control

Competition, predators, parasitoids and pathogens.

## B. Artificial control

### Components

1. Silvicultural control

natural and artificial forest , choice of silvicultural system, clear felling, mixed crops, monocultures.

2. Mechanical control

Collecting, trapping, barriers, tree bands, debarking, pruning.

3. Biological control

Utilizing predators, parasitoids, pathogen both indigenous and introduced, pheromones.

4. Chemical control

Insecticides, repellants, attractants, insect growth regulators, wood preservation.

5. Integrated pest management

# INSECT PEST OF STANDING TREES

## ❖ SAL HEARTWOOD BORER:-

Hoplocerambyx spinicornis

(order- Coleoptera Family- Cerambycidae),  
is the most injurious forest insect in India.

### ➤ Distribution:-

Assam, west Bengal, Orissa,  
M.P, U.P, H.P, & Punjab.

### ➤ Food plants:-

Mainly Shoera robusta but other food plants  
are Shorea obtusa, Shorea assamica,  
Havea braziliensis.

### ➤ Damage:-

The young grubs feed under the bark,  
and then in the sapwood, and finally  
they enter into the heartwood.



# Control measures:-

- a) **Silvicultural:-** The stocking of the Sal forest should not be allowed to become too dense, particularly in older crops.
- b) **Felling :-** Felling operation should be completed between October to March, i.e. well before the emergence of beetles.
- c) **Patrolling :-** Regular patrolling operation must be carried out throughout the winters to find out the standing attack Sal trees, wind falls etc.
- d) **Trapping:-** some trees are felled and left to act as traps for ovipositor.
- e) **Contact insecticides :-** The insecticides 5% Aldrin may be applied on the ground under the trees of active infestation.

# TEAK DEFOLIATORS

S. N. :- Hyblaea puera ,

order :- Lepidopera

Family :- Hyblaeidae

## ❑ Distribution :-

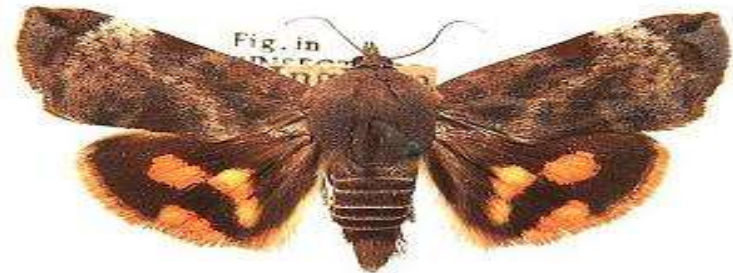
Through out indo – malayan rigion,  
south africa , westy india , it is  
found is all teakv growing area.

## ❑ Food plant :-

Mainly Tactona grandis ,  
other spp. Vitex negundo ,  
Premna latifolia, Callicarpa arborea.

## ❑ Damage :-

The young larva feeds on soft tissue  
by making depression on the surface  
of leaf , protecting itself with some of silk .





# CONTROL MEASURES

- a) *Light traps are not effective .*
- b) *Silvi cum-biological control*
- c) *To control the menace of teak defoliators, the parasites*
- d) *Chemical control: - This control is usually done in nurseries open forest areas also, in case of epidemic out-berks. Indosalfon, & systemic insecticides etc.*

# SHISHAM DEFOLIATOR

S.N. :- Plecoptera reflexa,

ORDER :-Lepidoptera

Family :- Noctuidae

❑ Distribution :-

Through out shisham growing areas of India .

❑ Food plant :-

Besides sisham ( DALBERGIA SISSOO),

Dalbergia latifolia & Pterocarpus marsupium.

❑ DAMAGE:- It is caused by caterpillar . The young caterpillar eats the lower epidermis and inner tissues of the leaf leaving the upper epidermis intact .The later instars eat the whole leaf, even the petioles and green shoot . However, larvae prefer to feed on young leaves. In epidemic defoliation, large number of caterpillars march on the ground in search of wood.

# Control measures:-

## I. Silviculture control:-

- a) Locality
- b) Irrigation
- c) Tree-stripping

## II. Mechanical control

- a) Sticky bands
- b) Insecticides

## III. Biological control

Various important predators and parasites of plecoptera reflexa can be introduced, e.g.

Anthia sexugutatta as predator and Disophrys sissoo etc.



# POPLAR STEM AND ROOT BORER

S.N. – Apriona cinerea

Order- Coleoptera, Family- Cerambycidae

Distribution:-

Jammu & Kashmir, H.P, U.P.

Food plants:-

Besides Populus spp., Ficus spp.,  
Morus indica, & Salix spp. Etc.

Damage:-

Larva bore to build a gallery in a branch. The larva tunnel in young trees runs from several feet up and down the centre of the heart and often extends into the main roots.



# Control measures

- (i) Collateral host of the stem and root borer should be removed from the vicinity of the popular plantations.
- (ii) pruning of effect branches in September-October and fumigation with para-trichlorobenzene or other fumigation successfully control the borer population.

# INSECT PEST OF NURSERIES

## 1. White grubs:- Holotrichia spp.

Order- Coleoptera, Family- Scarabaeidae

## Host plants:-

Teak, Bamboo, & grasses

besides agricultural crops.

## Control measures:-

- i) The beetles prefer sandy soil for egg laying.
- ii) The beetles are attracted towards light at night during premonsoon rains in June, light traps may be used to collect these beetles.
- iii) phorate 10 G @200 gms per bed & Nuvacron 36 E.C. @ 0.03% may be sprayed on the host trees.





# Termite

S.N — Odontotermes spp.

Order- Isoptera, Family- Termitidae

Host plants:-

Eucalyptus spp. Popular spp.

Teak, Sal etc.

Control measures:-

(i) application of Chloropyrifos

20 E.C. @ 0.03% (75 ml/ Bed).

(ii) Endossulfan 4% Dust @ 30 kg/hect.

(iii) Heptachlor 3% @ dust 35 kg/hect.

(iv) It is recommended to mix 750 ml Chloropyrifos in 50 lit of water for one cubic meter of dry soil, which is sufficient for nearly 1000 polythene bags of approximately 20 x 10 cm size.



# Cut worm

S.N- Agrotis ippsilon Huf.

Order- Lepidoptera, Family- Noctuidae

Host plants-

Eucalyptus spp. Pines etc.

Control measures-

(i) Irrigation also brings the caterpillars to the surface then birds destroy them.

(ii) Mixing Aldrin dust 10% in soil @ 40 kg /hec.

Can kill the larva.





# Grass-hopper

S.N- Hieroglyphus banian Fab.

Order- Orthoptera, Family- Acrididae

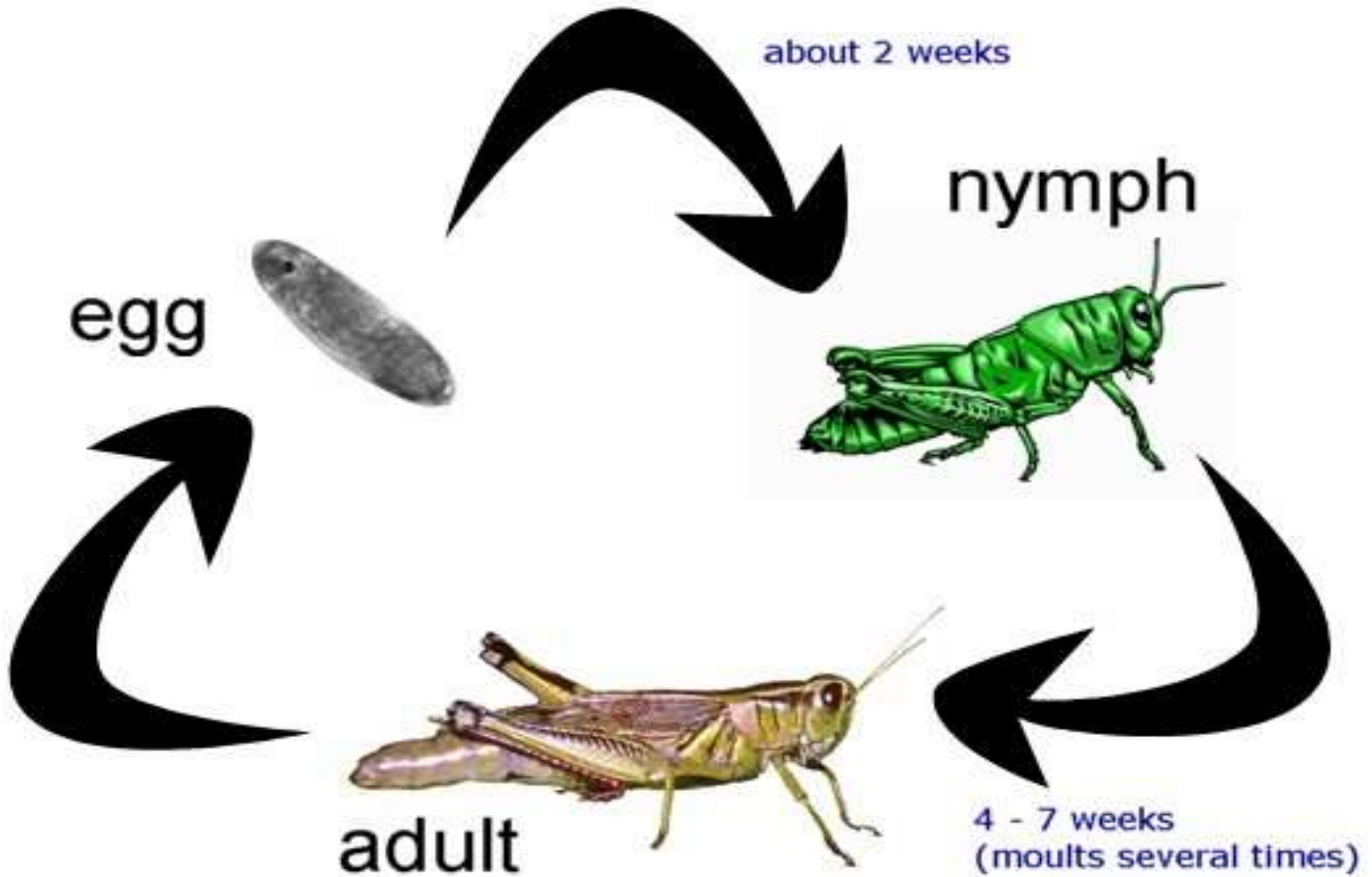
Host plants-

bamboo and Teak.

Control measures-

- (i) ploughing the field s for distribution of egg masses.
- (ii) Foliar spraying of malathion 50 E.C. @ 0.2% water emulsion spray is effective.





# Cricket

S.N- Brachytrypes portentosus Litch.

Order- Orthoptera, Family- Gryllidae

Host plants-

shisham, Eucalyptus, Teak.

Control measures-

- (i) picces of pumpkin attract crickets and hence can be used as traps.
- (ii) Flooding the tunnels with water and then pouring some kerosene which can be killed mechanically.



# INTEGRATED PEST MANAGEMENT

Integrated pest management (IPM) in a forest ecosystem is the process of managing a forest with all available tools so that potentially destructive organisms, such as insects and diseases, are maintain at a level that is below an economic or damage threshold. These tools are used in conjunction with forest management practices that are designed to meet the overall goals of the forest manager



# Concept

The concept of integrated pest control was introduced originally as a proposition to combine chemical control and Biological control procedures in response awareness about the harmful effects of synthetic organic chemical pesticides.





# Tools of IPM:

## 1. Cultural methods:

- a. Plant rotation
- b. Trap trees.
- c. Tillage
- d. Altered timings
- e. Clean cultures
- f. Soil manuring and fertilizers
- g. Pruning and thinning
- h. Growing resistant plant varieties

## 2. Mechanical Methods:

- a. Hand picking
- b. Shaking and beating of branches
- c. Binding
- d. Wire gauge screens
- e. Trapping



# 3. Physical Methods

- a. Cooling
- b. Heating
- c. Radiant energies

## 4. Legal Methods

- a. Plant quarantine Laws
- b. Insect passion Laws

## 5. Biological Methods

## 6. Chemical Methods

- a. Insecticides
- b. Chemoserilants
- c. Attractants
- d. Insect Growth Regulators



# SUGGESTED PRIORITIZATION OF PROCEDURES FOR IPM PROGRAMME OF FOREST INSECTS PESTS

- **Silvicultural measures** :- Suitable site, appropriate species, provenance suitable to the site, monoculture, mixed plantation.
- **Cultural measure** : Silvicultural practices, particularly forest nursery, weeding at regular intervals, pruning, thinning
- **Survey & detection** :- Conduct regular survey
- **Regular measures** :- To implement the regulatory measures with regard to export & import.



# Cont.....

- **Silvicultural method :-**

selective fellings, Trap tree methods.

- **Bioremediation methods :-**

Bioremediation through parasitoids/  
predators and where possible ,microbial  
control with pathogen.

- **Chemical control methods :-**

Last unavoidable procedure, principally.  
available for nursery pest problem

# conclusion

- Forest is the basic need for balancing environment.
- population of human being depend on it for fuel fodder timber and manly wood.
- many disease cause in forest done to the insect which cause great damage in forest.
- so the insect pest management and control is the best way to control and prevention form diseases in forest/plants.

# Nature Friends

