

**DIRECTORATE OF ADVANCED STUDIES
EVENT CATALOGUE
2021**

19TH SEMINAR OF DAS EVENTS CALENDAR – 2021

**URBAN INSECT PEST PROBLEMS AND THEIR
MANAGEMENT**



19th Seminar (Online through ZOOM) of DAS Events Calendar - 2021

URBAN INSECT PEST PROBLEMS AND THEIR MANAGEMENT

Presenter: Dr. Munir Ahmad

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Thursday, August 12th, 2021, Time: 02:00 p.m. - PKT GMT+5

ZOOM MEETING ID: 955 408 3170 - PASSCODE: 67890

Organized By: Directorate of Advance Studies, PMAS-AAUR

ACTIVITIES

Focal areas of urban insect pests

- Household insect pests
- Kitchen gardening insect pests
- Ornamental plants insect pests
- Structural insect pests
- Stored grain insect pests

Principles and Methods of Pest Management

Insect classification and life history

Knowledge of insect classification, growth and development, and life cycle is requisite

Introduced pests

Many insect pests travel from one country to another through transportation for food supply (unintentional), through introduction of insect biocontrol agents (intentional), carried with passengers (parasites), introduction of new cultivars

Survey and Detection

Personnel competency is important factor for detection of low level pest detection

Early detection of potential pests to delimit outbreaks (fruit fly)

Preventive Control

A regular pest requires to be controlled in early stage compared to maximum destruction stage

Curative Control

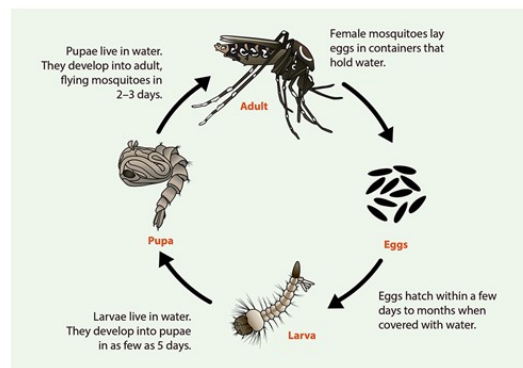
Utilization of synthetic insecticides and bio-rational new chemistry insecticides
Biological, cultural, mechanical and chemical control methods are common

Household insect pests

- Mosquitoes
- Cockroaches
- Flies
- Bed bugs
- House Cricket
- Ants

Mosquitoes

- Most dangerous insect pest as disease vector
- Most common species belong to genus: *Aedes*, *Anopheles*, *Culex*
- Vector of many diseases in humans and animals like malaria, dengue fever, yellow fever etc
- Favor humid and hot weather, shortest life cycle
- Screening, removal of stagnant water sources, wet debris, chemical control



Cockroaches

Indoor resident species

- Sanitation, food containment, moisture management
- Gel baits

Outdoor invader species

- Exclusion: door sweeps!
- Landscape / habitat / moisture management
- Tolerance?
- Granular baits? Sprays?



Flies and their Management

Most fly management is host/site-centric with key disease/problems being the management objective(s)

- e.g. Livestock fly management focuses on stable/face/horn flies, cattle grubs
- e.g. Urban fly management focuses on mosquitoes & human disease reduction
- Hospital fly management focuses on filth/house fly exclusion & elimination

Different approaches for flies control

- Personal Protection
- Exclusion (buildings, small areas)
- Insecticides
 - Residual
 - Non-residual
- Other
 - Trapping in sensitive areas
 - Mating Disruption



Bed bugs

Life cycle: egg, 5 nymphal instars, adults

- All obligate blood feeders
- Nest parasites (harborages within ~6' from host)
- NOT KNOWN to vector human pathogens
- Most important is: Identify the problem

Non-chemical control

- Disposal of infested items (clearly marked)
- Barriers (encasements, interceptors)
- Laundering (heat is most important)
- Vacuum (provide HEPA filter)
- Steam
- Heat ($> 45^{\circ}\text{C}$ or $> 115^{\circ}\text{F}$, 2 – 4 hours min.)
- Cold (below freezing, at least five days)

Chemical Control

Pyrethroids, Ops and IGRs with special care



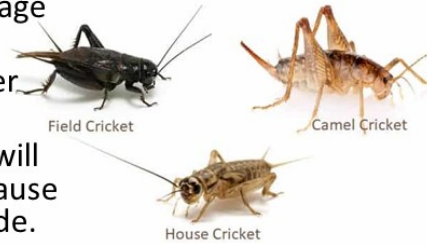
Ants

- Ants invade usually during hot and dry periods or during cold and wet periods, to escape such environmental extremes and to access unprotected resources
- Exclude ants from invading by properly sealing structures
- Wipe up ants and their trails indoors
- Use baits and bait stations
- (Allow up to two weeks for complete control)
- Sprays will not keep ants out of your home
- Outdoor spray residues can contaminate



House crickets

- House crickets are nocturnal or active at night and usually hide in dark warm places during the day
- Typically live outdoors during the warmer seasons and are especially fond of garbage dumps
- Often attracted to electric lights in larger numbers
- During cold weather approaches, they will move indoors to houses and sheds because of the moisture and warmth they provide.
- Cause damage to property specifically clothing, carpets and areas covered in fabric
- Favorite fabrics include wool, cotton, silk and synthetics
- It's important to get rid of crickets as soon as possible.



Kitchen gardening insect pests

Most common insect pests are:

Aphids

Whiteflies

Thrips

Mealybugs

Leaf worm

Fruit worm

Stem feeders

Root feeders

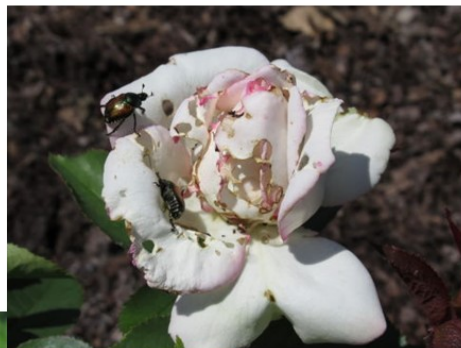


Ornamental plants insect pests

- Leaf miners
- Leaf hoppers
- Mealybugs
- Leaf beetles
- Bark beetles
- Stem borers
- Root weevils
- Scale insects
- Aphids
- Thrips



Japanese beetle damage



Leaf hoppers damage



Leaf beetle damage



Stem borer damage



Stored grain insect pests

- a) Khapra Beetle (*Trogoderma granarium*)
- b) Lesser Grain Borer (*Rhyzopertha dominica*)
- c) Red Flour Beetle (*Tribolium castaneum*)
- d) Saw Toothed Grain Beetle (*Oryzophilus surinamensis*)
- e) Maize Weevil. (*Sitophilus zeamais*)
- f) Grain Weevil. (*Sitophilus granarius*)
- g) Rice Weevil. ...
- h) Flat Grain Beetle (*Cryptolestes furrigenius*)



Stored grain insect pests Management

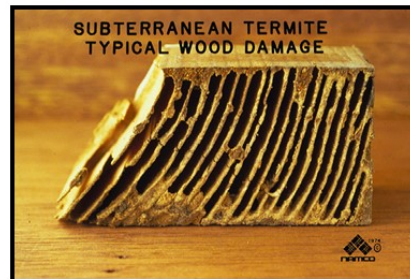
1. Sanitation of stores
2. Chemical control (Fumigation tablets)
3. Biological control (Bio-insecticides)
4. Controlled Atmosphere
5. Resistant varieties
6. Use of heat and cold environments

Structural insect pests

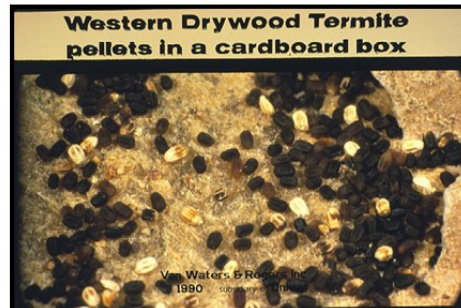
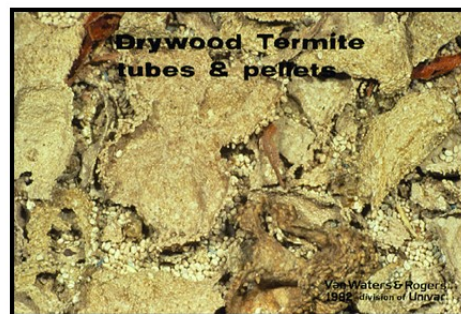
- Attack our homes, furnishings, out-buildings
 - Termites
 - Powder post beetles
 - Carpenter ants

Termites

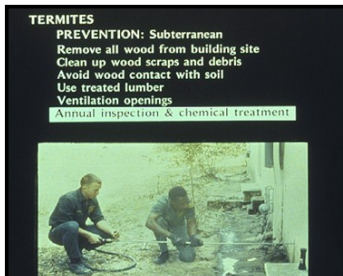
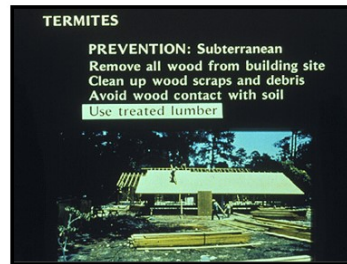
- Most important structural pest group
- \$1-3 billion/year in US
- More common in warm/humid situations
- Feed on cellulose - chief substance of wood
- Have division of labor
- Specific reproductives - most are “workers”
- Termites
 - Reproductives
 - Soldiers
 - workers



Termites feed on cellulose



How to prevent termite damage?



Powder post beetles

- Powder post beetles are second only to termites in their ability to damage dry, seasoned wood
- May cause considerable confusion for homeowners, wood suppliers, manufacturers, builders, and even pest control companies

Major species of powder post beetles and their damage



Active versus inactive damage by powder post beetles



Localized replacement of wood, humidity maintenance are major factors in control

Carpenter ants

- Nest in wood - do not feed on it
- Common worldwide
- More of a pest in temperate areas
- Social structure much like termites
- Beneficial in nature - important decomposers
- Predators
- Soil contact not needed
- Always associated with wood
- Can be very difficult to locate the main colony

