

Insect Pests of Cotton

Ent-202

SPOTTED BOLLWORM

Technical names: *Earias insulana*

Earias vitella

Family: Noctuidae

Order: Lepidoptera

Identification

Earias insulana

- The eggs are light green
- Larva - greenish white with black marks on the body
- Adult moths - forewings completely green



Earias vitella

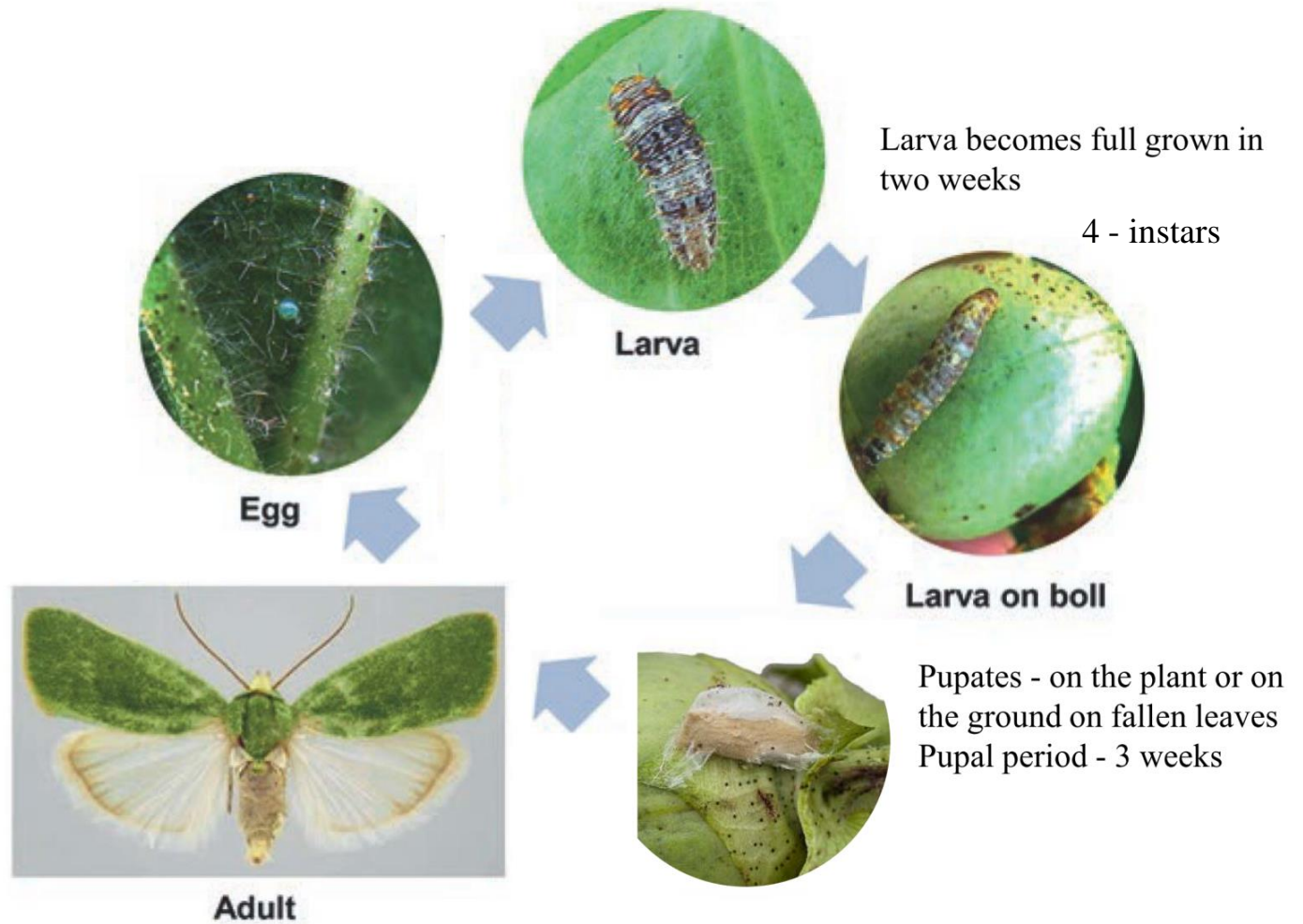
- The eggs are green.
- Larvae - brownish.
- Longitudinal green band in the middle of fore wing



Earias insulana

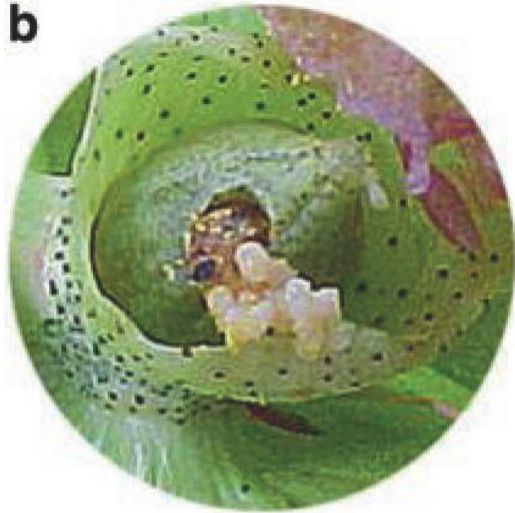
Hatching - 1 week

200-400 eggs – leaves,
Square, flowers



Earias vitella

b



Damage symptom



Egg



5 instars

Larva



Pupae



Adult

Pupate in soil
up to 30 cm depth

Damage

- Firstly, the larva bore into the terminal portion of the young shoots which wither away and dry up
- Then they bore the squares, flowers and buds and eat the internal contents
- Lot of shedding of these parts
- Lint is also of poor quality

Control

- Clean cultivation and destruction of alternate host plants
- Early sowing of crops
- Use of resistant varieties
- Natural enemies of the pest (predators, parasitoids) should be promoted in the field
- Application of insecticides
 - Cypermethrin EC 200-250 ml/acre
 - Spinosad SC 80 ml/acre
 - Emamectin benzoate EC 75ml/acre

Pink Bollworm

Technical Name: *Pectinophora gossypiella*

Family: Gelechiidae

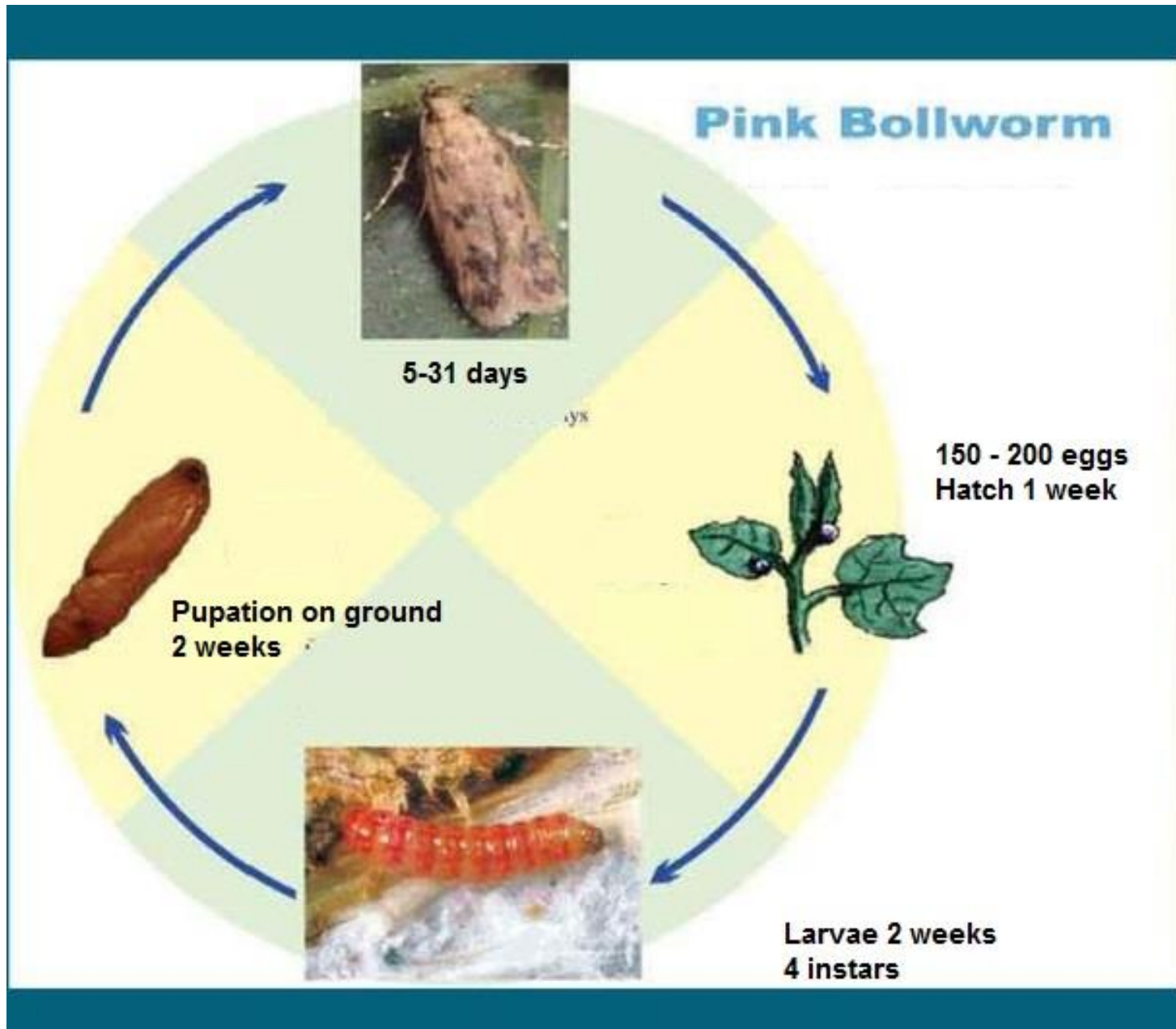
Order: Lepidoptera

Identification

- Eggs - oval and white
- Larva - pink color
- Adults - dark brown with blackish spots on forewings



Life Cycle



Damage

- Larva bore the squares, flowers and bolls and eats the internal contents
- Two adjoining seeds join and form “Double Seed”.
- Hibernating larvae lie in the double seed for many months and pass winter
- If the larvae enter in the squares, such squares do not open properly and called “Rosette Flowers”
- After attack on bolls the larvae close its entrance
- Lot of shedding of these parts
- Lint is of lower quality





Control

1. Clean cultivation and destruction of sticks, fallen bolls
2. After picking, grazing of sheep on the unwanted bolls in the field
3. Natural enemies of the pest (predators and parasitoids) should be promoted in the field
4. Application of triazophos EC 1000ml/acre

American Bollworms

- Technical name: *Helicoverpa armigera*
- Family: Noctuidae
- Order: Lepidoptera

Identification

- Larvae – greenish with dark grey lines on body
- Moth – yellowish brown with black kidney shaped mark on underside of forewings



Life cycle

- Female lay egg singly on fruiting parts, leaves
- Eggs - round, greenish yellow
- Pupate in soil
- Pupae – dark brown, sharp spine at end
- 8 generation per year
- Cannibalism

Helicoverpa armigera



7 days
500-3000 eggs



14 days
6 instars

Eggs



Feeding behavior and
damage symptoms



Adult

10-20 days



Pupa

10 days

Damage

- Larvae – polyphagous
- Feed on foliage, bolls – reduce yield
- Bolls show prominent hole
- Dirty faeces accumulate on the boll surface
- Damage is not uniform – in patches



Control

- Avoid cultivation of alternate host like okra, tomato, tobacco
- Resistant cultivars
- Biological control agents; Ichneumonid wasp – larval parasitoid
- Spray profenofos EC 800 ml/acre

Armyworm

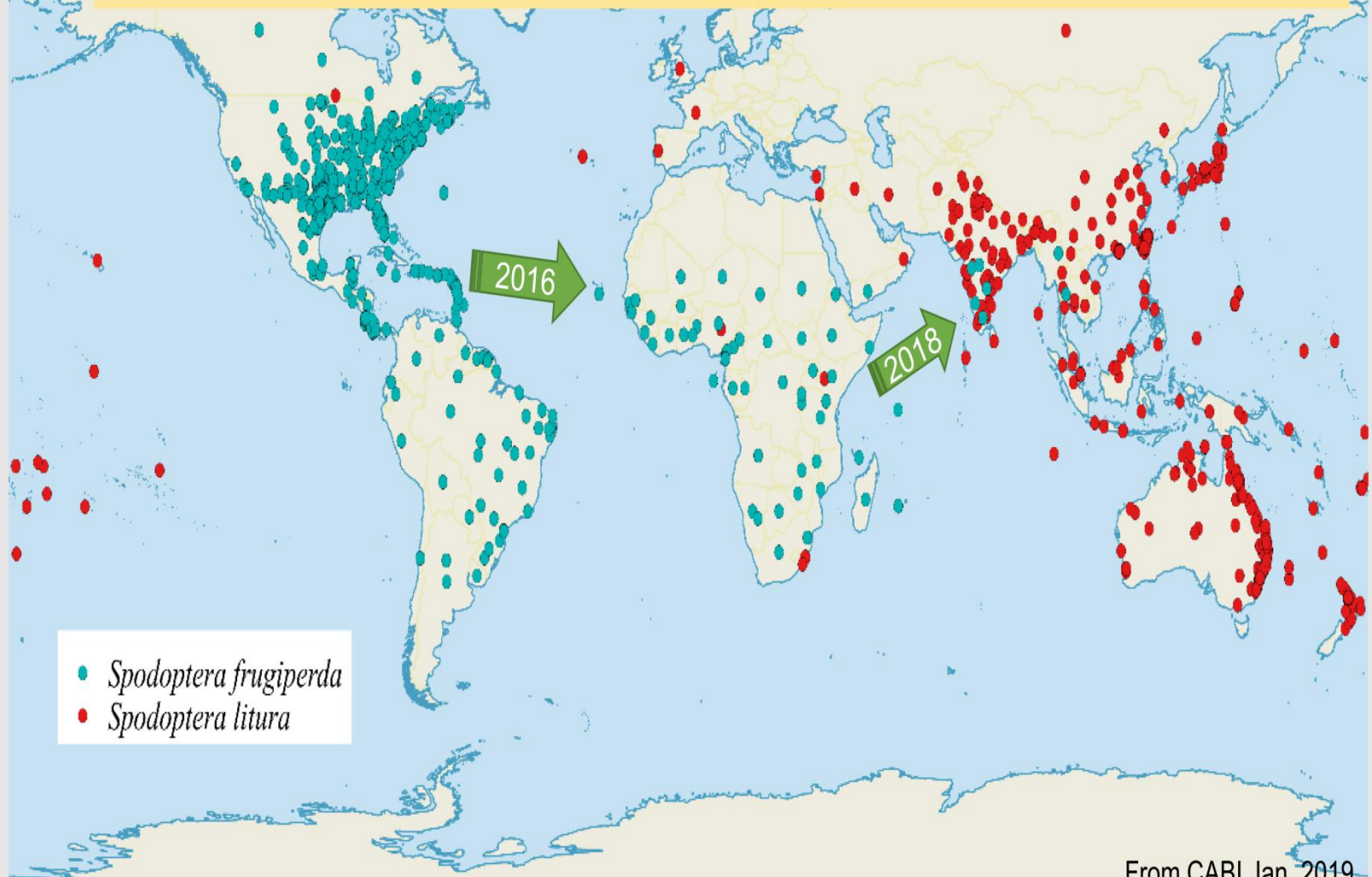
- T.N: *Spodoptera litura*
- Family: Noctuidae
- Order: Lepidoptera





• The spread of *S. frugiperda* & *S. litura* worldwide

(No *Spodoptera frugiperda* reported in the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu – yet)



Identification

- Eggs: round, green color then turn yellow to black

Eggs



Egg mass



Egg mass with early instars emerging

- Larvae: dull brown – later turn green

Identification: larvae



Fourth and fifth instar larvae



- Adult: pale brown

Identification: adults



female (left) and a male (right)



male

Note: Positive identification requires dissection of adult.

Life cycle

Hatching 1 week March-May
2-3 weeks Dec-Jan



Larvae pass through six instars
Spring: 2 weeks
Winter: 2-3 months



Pre-pupal stage : 1 week, cocoon formation



Pupae: 2 weeks in May
6-8 weeks in Winter months



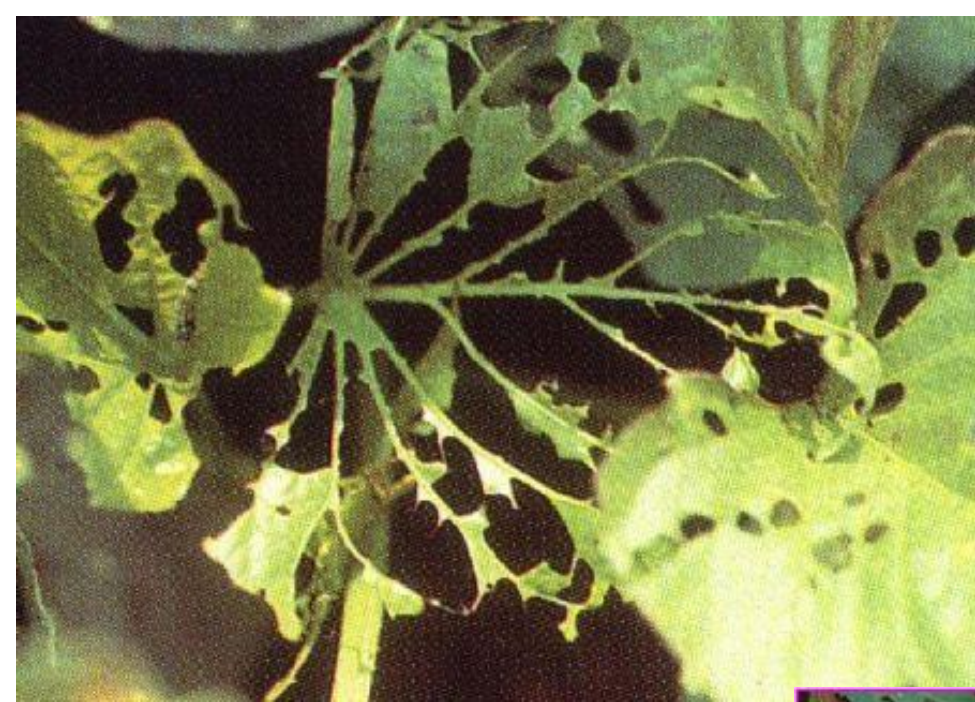
Adults can live for 8 to 10 days



Armyworm

Damage

- Freshly emerged larvae – feed on tender leaves,
- Mature larvae – feed on older leaves, skeletonize them
- Fecal pellets are quite prominent
- In case of sever attack – whole leaves including midrib consumed – looks like grazed by cattle





Case Study - Controlling *Spodoptera litura*

S. litura

(Tobacco cutworm, Armyworm)

- Order: Lepidoptera
- Family: Noctuidae
- Genus: *Spodoptera*



Control

- Sticky traps and light traps
- Biological control
- Insecticides
 - Lufenuron EC 800ml/acre



Biological control agents

- Parasitoids
 - *Snellenius manilae* (Ashmead)
 - *Charops bicolor* (Szepliget)
- Fungus
 - *Beauveria brongniartii*
 - *Metarhizium anisopliae*
- Bacteria (Commercial application)
 - *Bacillus thuringiensis*
- Virus
 - NPV
- Entomopathogenic nematodes (thread worms)



Recorded Natural Enemy in the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu	
Hemiptera	<i>Andrallus spinidens</i> (Fabricius) <i>Cantheconidea farcellafa</i> (Walf) <i>Eocanthecona furcellata</i> (Wolff) <i>Orius strigicollis</i> (Poppus) <i>Zicrona caerulea</i> (Linneus)
Neuroptera	<i>Mallada basalis</i> (Walker) <i>Mallada desjardinsi</i> (Navás)
Hymenoptera	<i>Apanteles ruficrus</i> (Haliday) <i>Campoletis chlorideae</i> (Uchida) <i>Charops bicolor</i> (Szepliget) <i>Chelonus formosanus</i> (Sonan) <i>Cotesia plutellae</i> (Kurdjumov) <i>Cotesia ruficrus</i> (Haliday) <i>Euplectrus</i> sp. <i>Meteorus</i> sp. <i>Metopius rufus browni</i> (Ashmead) <i>Microplitis pallidipes</i> (Szepliget) <i>Microplitis tuberculifer</i> (Wesmael) <i>Snellenius manilae</i> (Ashmead) <i>Telenomus remus</i> (Nixon) <i>Trichogramma dendrolimi</i> (Matsumura)
Coleoptera	<i>Calleida splendidula</i> (Fabricius) <i>Chlaenius naeviger</i> (Moraritz) <i>Paederus fuscipes</i> (Curtis) <i>Pheropsophus javanus</i> (Dejean)
Diptera	<i>Pseudogonia rufifrons</i> (Wiedemann)

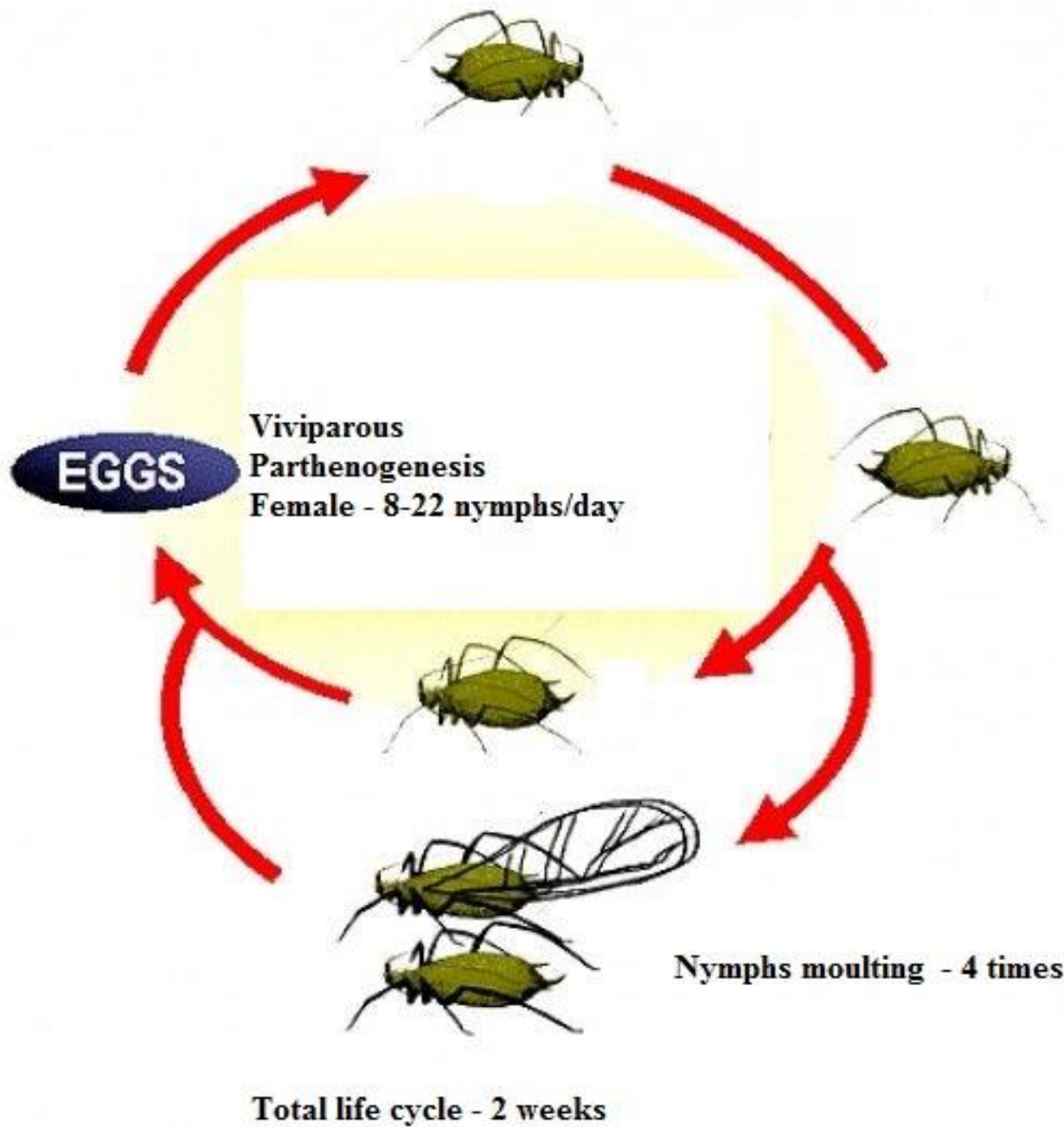
Cotton Aphid

- T.N. *Aphis gossypii*
- Family: Aphididae
- Order: Hemiptera

Identification

- Adult: small and greenish-brown in color
- Both winged and wingless
- Found in colonies in soft and tender plant parts





Damage

- Found in colonies on soft and tender plant parts
- Suck cell sap
- In case of sever infestation – plant weak, stunted, leaves curled and wither
- Damage is more on younger plants
- Secrete honeydews which promotes sooty mold growth



Control

- Coccinellid – predators
- *Aphelinus* sp. – parasitoids
- When honeydew appear on 50% plants spray
 - Bifenthrin EC 150 ml/acre
 - Imidacloprid SL 80ml/acre



Cotton Thrips

- T.N. *Thrips tabaci*
- Family: Thripidae
- Order: Thysanoptera

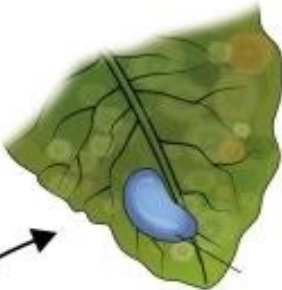


Identification

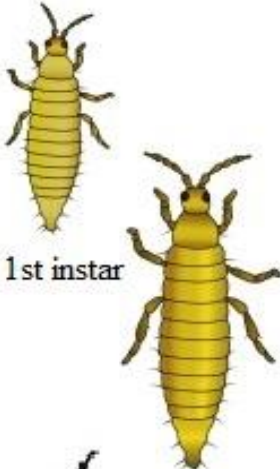
- **Adults:** slender – yellowish brown – 1mm length
- **Males** – Apterous
- **Female** – winged (long, narrow wings having long hairs on hind margins)
- **Nymphs** resemble with adults but smaller and wingless



Active throughout the year



50-60 eggs
singly on foliage
Kidney shape



1st instar

2nd instar

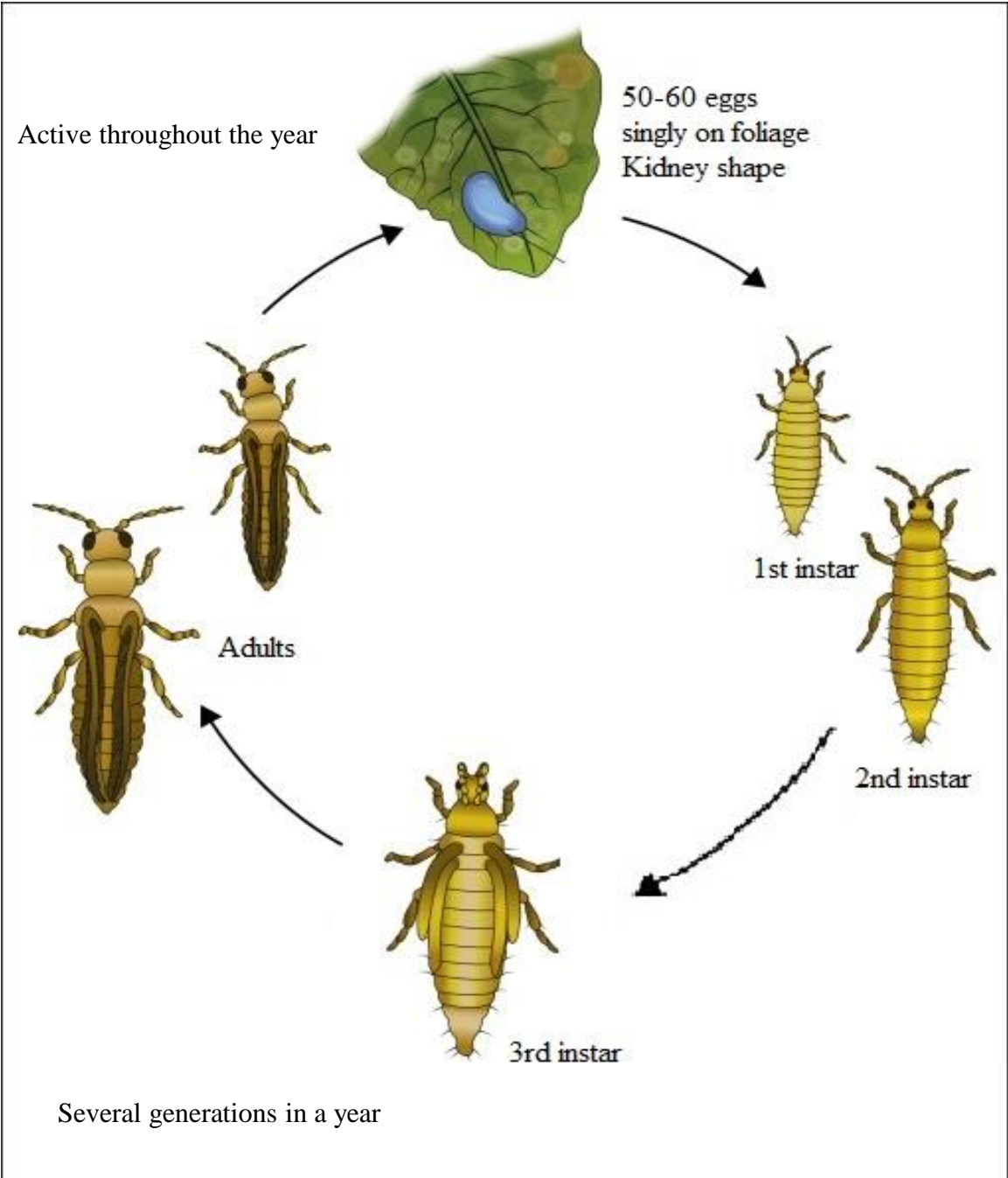


Adults



3rd instar

Several generations in a year



Damage

- Both adults and nymph feed
- Leaves become silvery white, wrinkled and fall off
- Plants bear very few bolls
- Cotton production reduce



Control

- Spray
 - Imidacloprid SL 75ml/acre
 - Spinosad SC 40 ml/acre

Cotton Jassid

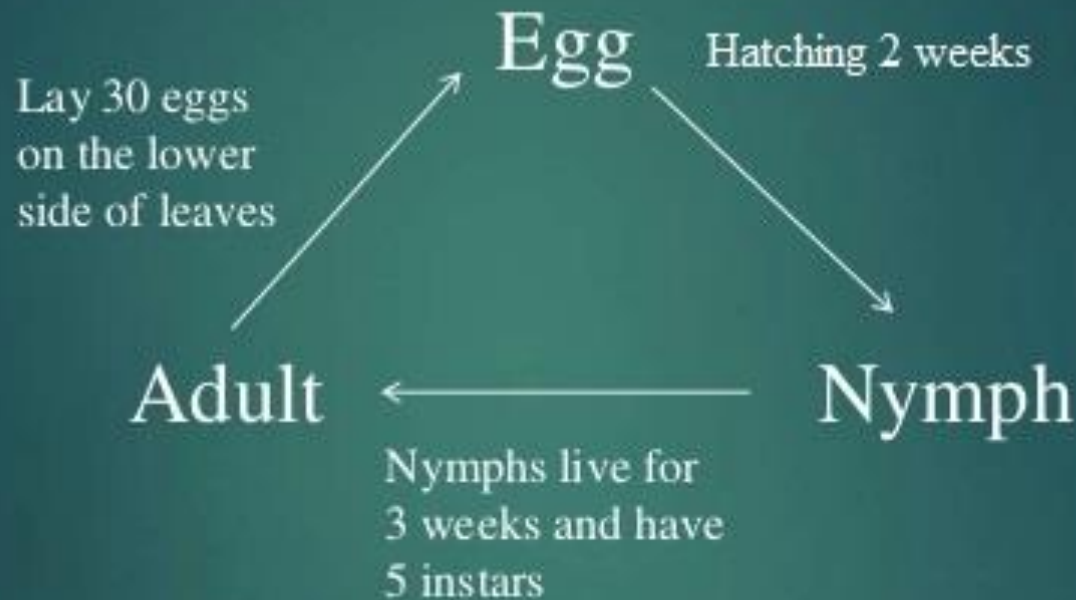
- T.N. *Amrasca biguttula*
- Family: Cicadellidae
- Order: Homoptera

Identification

- Eggs – yellowish white
- Both adults and nymphs –
greenish yellow with black spot
on tip of forewing



Life Cycle of Cotton Jassid:



There are 7 generations of this pest in a year

Damage

- Both adults and nymphs suck cell sap
- Leaves show – yellow and later reddish spots
- Attacked leaves turn downward, dry, and fall
- Leaves become weak and fruit fall



Control

- Clean cultivation
- Destruction of alternate host
- Hairy cotton varieties
- Predator – green lacewing
- Spray
 - Acetamiprid SP 125 gm/acre



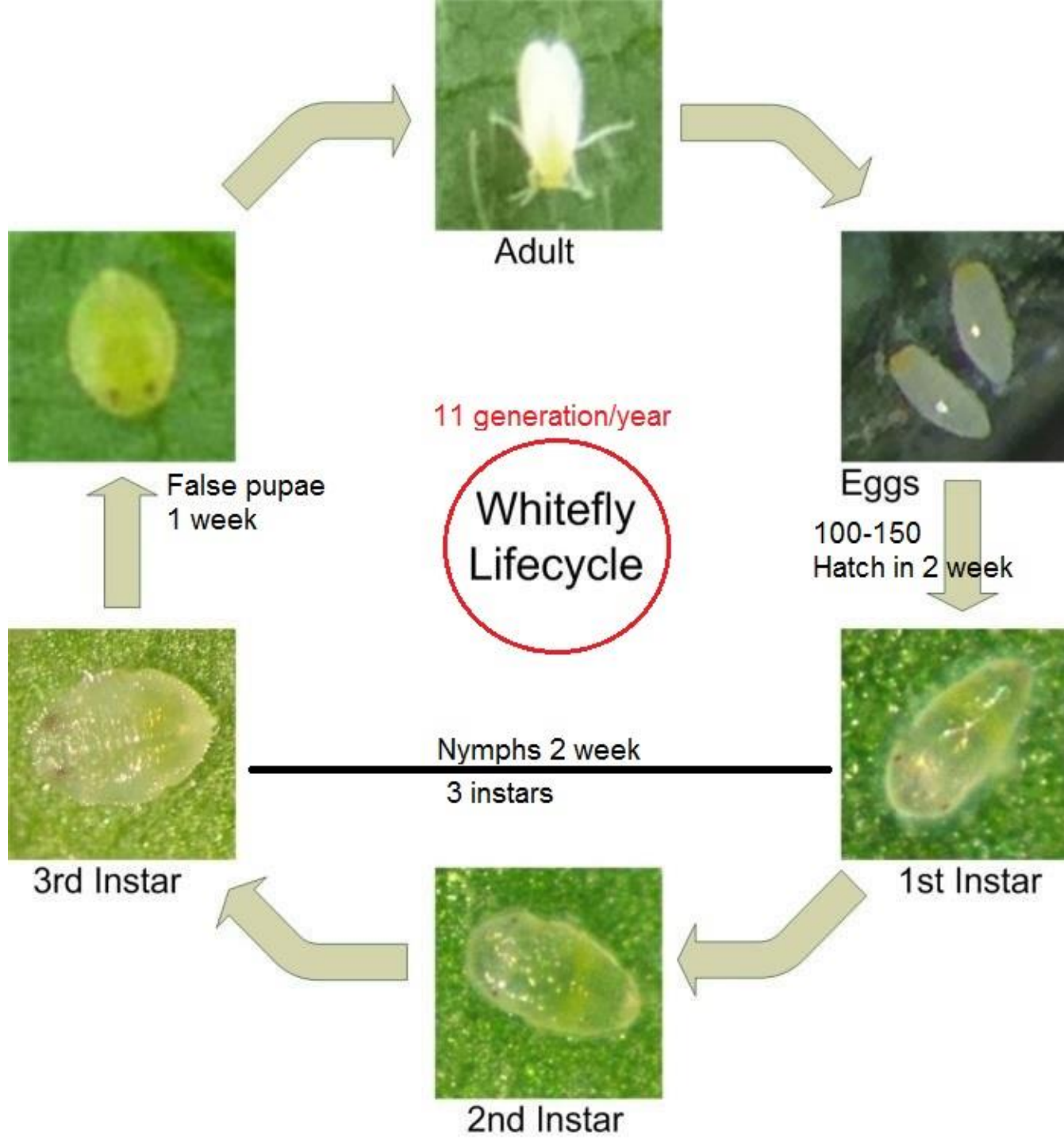
Cotton whitefly

- T.N. *Bemisia tabaci*
- Family: Aleyrodidae
- Order: Homoptera

Identification

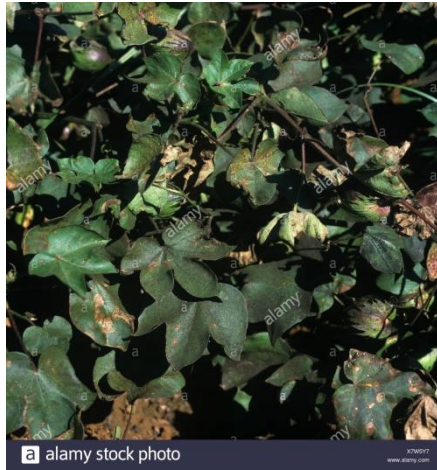
- Eggs – creamy white
- Nymphs - pale yellow
- Adults – pure white wings





Damage

- Nymphs and adults suck cell sap
- Leaves – yellowish spot, dry and fall
- Plant become stunted
- Secrete honeydew on plant – black mold grow
- CLCV



Control

- Destruction of alternate host plants
- Avoid over irrigation in cotton
- Predators – green lacewings, coccinellids
- Parasitoids - *Encarsia* spp.
- Insecticides
- Acetamiprid 125 gm/acre
- Imidacloprid 250 ml/acre

