

INSECT PESTS OF TOBACCO



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MAJOR PESTS OF NATIONAL SIGNIFICANCE

Sl. No.	Common Name	Scientific Name	Family	Order
1	Leaf eating caterpillar	<i>Spodoptera litura</i>	Noctuidae	Lepidoptera
2	Whitefly	<i>Bemisia tabaci</i>	Aleyrododae	Hemiptera
3	Stem borer	<i>Scrobipalpa heliopa</i>	Gelechiidae	Lepidoptera
4	Gram pod borer/ Bud worm/ Capsule borer	<i>Helicoverpa armigera</i>	Noctuidae	Lepidoptera
5	Tobacco aphid	<i>Myzus nicotianae</i>	Aphididae	Hemiptera

MAJOR PESTS OF REGIONAL SIGNIFICANCE

Sl. No.	Common Name	Scientific Name	Family	Order
1	Cut worm	<i>Agrotis ipsilon</i>	Noctuidae	Lepidoptera
2	White grub	<i>Holotrichia spp.</i> <i>Phyllophaga spp.</i>	Scarabaeidae	Coleoptera
3	Tenebrionid beetle	<i>Mesomorphus viliger</i>	Tenebrionidae	Coleoptera
4	Rove beetle	<i>Bledius gracillicornis</i>	Staphylinidae	Coleoptera
5	Grasshoppers	<i>Acrida exultate,</i> <i>Atractomorpha crenulata</i>	Acrididae	Orthoptera
6	Cotton mealybug	<i>Phenacoccus solenopsis</i>	Pseudococcidae	Hemiptera

1. Tobacco cut worm

S.N: *Spodoptera litura*

(Noctuidae: Lepidoptera)

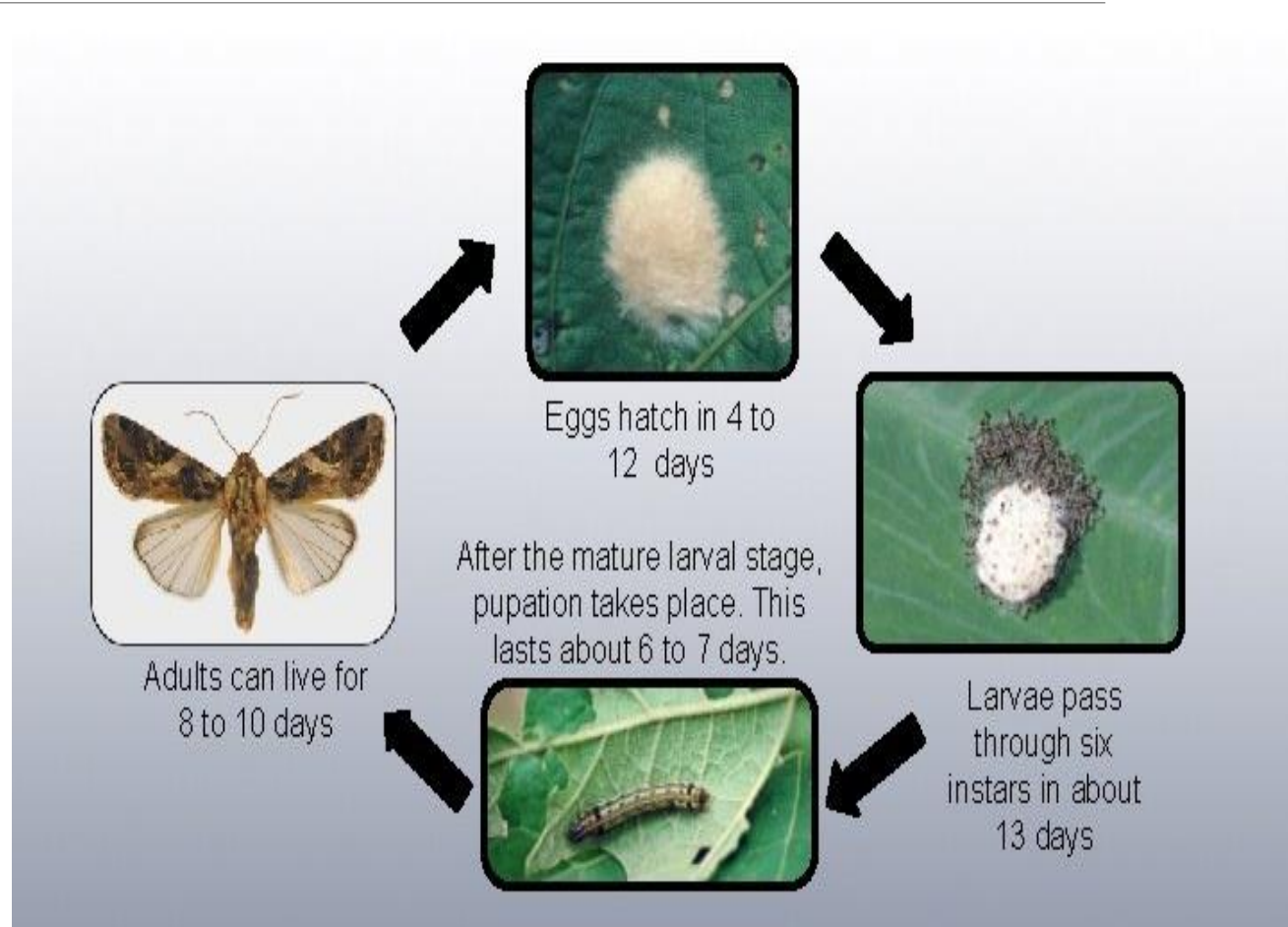
- This is commonly known as **tobacco caterpillar** or **tobacco cut worm**
- It is the most dangerous pest in tobacco nurseries, some time causes damage in the main field also.
- **Distribution** : It has wide distribution and besides India it is present in Vietnam, Indonesia, Australia, China and Fiji
- **Adult** is a medium sized, stout bodied moth
- **FW:** are dark brown or greyish brown colored with zigzag white markings
- **HW:** are white with out markings with a brown border

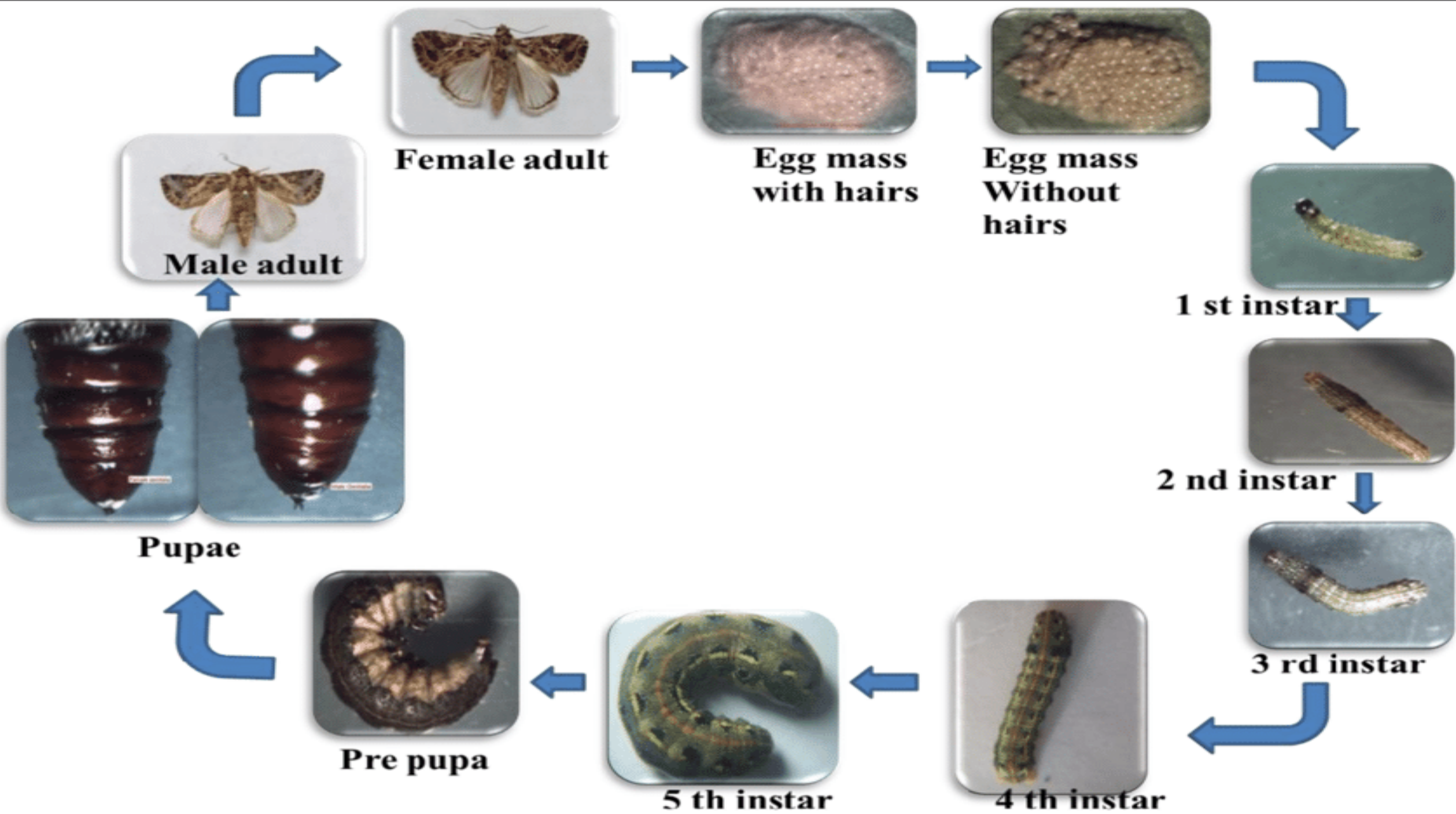




Biology

- Eggs are laid in batches and covered with brown coloured hairs on the tender leaves
- A single female can lay on an average 2000 eggs. (I.P- 7-10 days)
- There are 5 larval instars.
- The full grown caterpillar is about 3.5 cm long and pale green to brown colour with dark marks on the body. (L.P- 15-20 days)
- It pupates in the soil. (P.P – 7-10 days).
- Total life cycle takes place for 32-49 days.





Nature of Damage

- **When seedling are small they cut the seedlings at ground level and feeds on leaves hence they also known as cut worms.**
- **They voraciously feed on the leaves when the seedlings are grown up.**
- **3rd and 4th instar larvae are particularly voracious feeders and if no measures are taken entire seed beds will be defoliated within a week.**
- **During day time hide under soil.**
- **In severe case the plants are completely destroyed.**
- **In main field they cause skeletonization of leaves.**





Damage of *S. litura* in field crop

Management

- **Deep ploughing of nursery during April – May will facilitate the exposure of pupae to high temperature and natural enemies.**
- **Sow Castor as a trap crop around tobacco so that the castor puts up sufficient foliage by the time *Spodoptera* infestation builds up**
- **The Castor seedlings attract female moths for egg laying, clip of the leaves having egg masses and tiny caterpillars and destroy them**
- **Install pheromone traps @ 4 traps / acre at 2 weeks after germination**
- **If the catch of male *Spodoptera* moths is more than 5 / trap, Spray 1 % NSKE on 3 weeks old seedlings and 2 % NSKE on 4 weeks old seedlings or**
- **1125 liters of NPV solution prepared from 250 NPV infected larva by mixing with 250gm of rice powder or starch powder during evening hours or**

Management

- *Bt* var. kurstaki @ 1 kg in 1125lit. of water / ha for the control the pests.
- If the number of seedlings damaged by *S. litura* exceeds 6/m² area, spray any one of the following insecticides from 4 weeks on wards

Emamectin benzoate 5 SG @ 5gm in 10 lit. of water

Novaluron 10EC @ 10ml in 10 lit. of water

- During Cyclonic weather, tobacco caterpillar can be controlled by putting **poison bait**.
- This is prepared by dissolving **6.25 kg of Jaggery in 12.5 lit. of water** and adding to this **chlorpyriphos 20% i.e. 2 liters**.
- To this **25kg rice bran** is slowly added by mixing it thoroughly with a smooth stick so that the bait is made in to small balls
- These balls is broad casted on the nursery beds during evening hours.

2. Black caterpillar/ cut worm S.N: *Agrotis ipsilon* (Noctuidae: Lepidoptera)

- This pest mostly occurs in Gangetic plains and occasionally in AP.
- The adult is fairly larger in size, with a wingspan of 40 to 55 mm
- Fore wing is pale brown with dark purplish brown along costal end.
- Hind wing is white with brown tinge.
- Males have bipectinate antenna and females have filiform antenna.





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Egg



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Larvae



T. Baute

Pupa

Nature of Damage

- **Caterpillar cuts the stalk of seedlings as well as transplanted plants at ground level.**
- **They feed only at night and may be found in the day time either just below soil level or under leaves.**



3. Beet Armyworm

S.N: *Spodoptera exigua*

(Noctuidae: Lepidoptera)

- The caterpillar is a pest of tobacco in AP
- A female moth lays up to 1300 eggs in batches.
- Egg, Larval and Pupal stages lasts for 2, 15 and 16-17 days respectively under south Indian conditions
- The caterpillar pupates on the surface of soil or rarely at depths of 5-10cm
- The larvae remove mesophyll from the lower surface of leaves and destroy completely the first formed leaves of seedlings
- They do not attack the plants that are over a month old.



4. Green semilooper

S.N: *Plusia signata*
(Noctuidae: Lepidoptera)

- **Adult – medium sized, brown coloured moth with white streaks on the forewing.**
- **Due to larval feeding, tender leaves have large irregular holes and finally defoliated completely.**



Caterpillar Management

- **These caterpillars some times infest tobacco nurseries can also controlled by spraying any one of the following insecticides**

Monocrotophos 36 SL @ 15 ml

or

Chlorpyriphos 20 EC @ 25 ml

or

Quinalphos 25EC @ 15 ml

or

Acephate 75SP @ 10 gm

or

Methomyl 24L @ 18 ml



in 10 lit. of water

5. Tobacco stem borer

S.N: *Scrobipalpa heliopa*

(Gelechiidae: Lepidoptera)

- The tobacco stem borer is an important pest in many parts of India especially on **VFC tobacco** (Virginia flue cured tobacco) and **Natu tobacco** in AP, **FCV tobacco** in Karnataka and **Bedi tobacco** in Gujarat
- It is also reported from various Countries such as Malaysia, Indonesia, Australia, New Guinea, Philippines
- **Adult is a small dark brown coloured moth with fringed wings**



Biology

- **Eggs:** In bedi tobacco the **female moth lays cylindrical eggs singly more on the upper surface of the leaves of seedlings.** Fecundity – 50-80 eggs/ female. (I.P – 4-6 days)
- **Larva:** there are 4-5 larval instars
- The caterpillar slender, measures 7-9 mm in length, pale greyish in colour with brown coloured head and prothoracic shield. (L.P – 15-20 days)
- **Pupa:** **Pupation takes place within the swellings or galls after making exit hole.** (P.P- 9-10 days)
- The adults after emergence survive for 2-14 days.
- Total life cycle extends over 4-5 weeks

Nature of Damage

- **Newly hatched caterpillar will mines the leaves for a while**
- **Later bore in the midrib, leaf stalk and finally reaches main stem, feed on internal tissues causing the formation of swellings on the stem.**
- **The gall formation leads to stunting of the plants and unusual branching of the infested seedlings at the tip.**





**Damaged seedlings of VFC
tobacco**
(Virgin flue cured tobacco)

Management

- **To remove infested seedlings and destroy them at the time of planting.**
- **Split open the galls on the stem and crushed the larvae.**
- **Treat the nursery with carbofuron 3 G before sowing @ 5gm / m²**
- **In tobacco nurseries – chlorpyrifos 20 EC @ 0.05 % conc. (20 ml in 10lit. of water) at 30 and 40 days after germination.**
- **Final spray should be given before pulling out seedlings**
- **Deep ploughing of left over nursery beds and removing all crop stubbles in the field and burning them to prevent carry over of infestation to the next season.**

6. Whitefly

S.N: *Bemisia tabaci*

(Aleyrodidae: Hemiptera)

- The white fly is distributed widely and is an important pest of tobacco.
- **The importance of white fly is that it is a vector “leaf curl disease of tobacco” in India.**
- The adult female differs from male in having stout abdomen and longer wings and pupa is bigger than male pupa.
- **It attacks the crop in nursery and main field**
- more than 100 host plants are recorded in India alone, of which 12 shows disease symptoms similar to tomato leaf curl virus.



Nature of Damage

- **Leaves of affected plants are curled, twisted, ruffled (disturb smoothness) or wrinkled, punctured and thickened with abnormal prominent veins.**
- **The attacked plants are stunted, both yield and quality are reduced.**
- **The diseased leaves are still suitable for chewing or snuff making but not suitable for flue curing.**
- **White fly is the important vector of leaf curl virus.**



b



Management

- **Remove and destroy alternate hosts around nurseries and main field.**
- **Avoid leaf infected seedlings for transplantation.**
- **Remove and destroy leaf curl infected plants (if there population is less than 2 % in transplanted crop).**
- **Avoid cultivation of Brinjal and Sunflower in the vicinity of tobacco.**
- **Setting up of yellow sticky trap made out of GI sheet of 12cm X 15cm size and 2mm thickness coated with castor oil @ 12 traps/ ha. for monitoring.**
- **When trap reach 100 white flies/ trap adopt the following spray schedule commencing from 4th week after germination in nursery or 10 days after transplanting in main field at weekly intervals**

Management

- **1st spray – Chlorpyrifos @ 25 ml in 10 lit. of water**
- **2nd spray – Acephate @ 10gm in 10 lit. of water**
- **3rd spray – Monocrotophos @ 15 ml in 10 lit. of water**
- **4th spray – Oxydemeton methyl @ 15 ml in 10 lit. of water**
- **1000 litres spray solution required / ha**

7. Grasshoppers

S.N: *Atractomorpha crenulata*
(Acrididae : Orthoptera)

- These are green or brown jumping insects commonly noticed in tobacco nurseries.
- Nymphs and adults feed on leaves making circular holes.
- Cultural practices like keeping the nursery area clean, free of weeds and grasses helps to keep away the grasshoppers
- Spray the surrounding vegetation with chlorpyrifos 20 EC @ 25 ml in 10 lit. of water or dust the area with malathion 5 % D @ 40gm/ 10m² area



Atractomorpha crenulate (above) and *Cyrtacanthacris tatarica* (below)

8. Mealy bug

S.N: *Phenacoccus solenopsis*

(Pseudococcidae : Hemiptera)

- **Nymph and adult feed on phloem and excrete honey dew which encourages the development of sooty mould that reduces plant photosynthetic abilities which ruins the plant's appearance makes the leaves unfit for curing.**



8. Tobacco Aphid

S.N: *Myzus persicae*

(Aphididae: Hemiptera)

- Aphid was first reported in AP in the year 1990 – 91 with almost 80-90 % infestation
- Crop loss due to aphids - 513 kg / ha green leaf
- - 70 kg / ha bright leaf
- This pest reported from CTRI, Rajahmundry, AP
- ETL for aphids is fixed less than 2% infestation during epidemic year and 2 % infestation level during normal years
- Aphid infestation results in reduction in quality
- These are polyphagous insects found to feed on a number of host plants



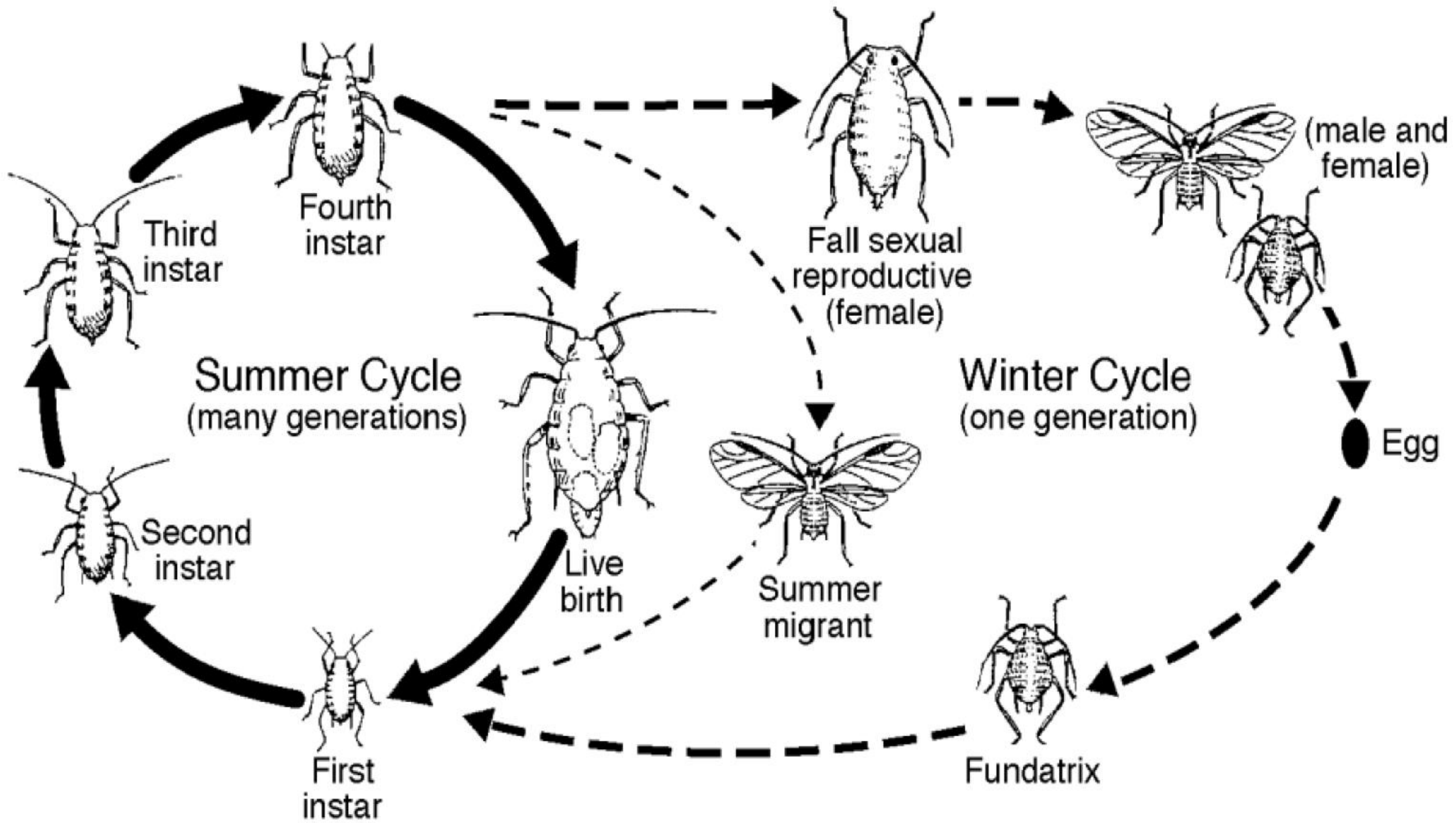
Morphology

- Aphids are pink to brown or green coloured winged or wingless insects with cornicles on the abdomen
- If the infestation is heavy, hundreds of them can be seen on lower side of the leaves and shoots
- **Host range:** More than 40 host plants have been identified.
- Tobacco, Capsicum, Sesamum, Orobanche, Brassica, Brinjal, Cabbage, Mustard etc.



Biology

- **Both apterous (wingless) and alate (winged) forms pass through 4-5 nymphal instars in their development and nymphal period ranges from 5-7 days.**
- **Both the forms mate within a day or two after the final moult and start reproducing young ones**
- **In the field generally viviparous apterous forms are observed in large number**
- **The winged forms are black or reddish with transparent wings, They are responsible for spreading the infestation from plant to plant and establish new colonies**
- **They reach peak from December and to first week of January**
- **This period is critical period for tobacco plant puts up its maximum efforts for growth and leaves get ready for priming**
- **From January end or first week of February, they start declining due to rise in temperature**



Nature of Damage

- These aphids occurs in large numbers on the under surface of the leaves and shoots and their feeding causes curling and yellowing of leaves.
- Excrete lot of honey dew and development of sooty mould and finally the attacked leaves are unfit for curing.



Nature of Damage

- Aphids are the important vectors of viral diseases of tobacco
 1. Tobacco mosaic disease
 2. Cucumber mosaic virus
 3. Rosette disease of tobacco



Management

- **Topping or removal of inflorescence/ tender shoots coupled with usage of recommended dosage of nitrogen is useful for management.**
- **Topping stimulates (Increase vigour) – the accumulation of carbohydrates in leaf and also coincides with nicotine production in leaf which known to have insecticidal properties**
- **Mulching with aluminum foil (Thin plate of metal) of 61cm width and also using wheat straw as a mulch to reduce the aphid population by more than 50%.**
- **Using aluminum – because of reflection of light**
- **Using green lace wing @ 6 larvae/ plant and release 2nd instar larva to reduce the infestation by more than 50% release should be at the beginning of infestation.**
- ***Coccinella transversgatus* @ 16 larvae / plant up to 54 % reduction under green house condition.**

Management

- *Chelomenes sexmaculatus*, Syrphids – *Ischiodon scutellaris*, Spiders
- Fungal pathogens – *Verticillium lecanii* @ 30 X 10⁶ spores / ml
- - *Fusarium sp.* @ 1 X 10⁶ spores / ml
- Prophylactic sprays with acephate during early winter @ 10 gms / 10 lit. of water or Oxydemeton methyl 25 EC @ 20ml in 10 lit. of water.
- Subsequent sprays should be given only on infested plants 10-15 days interval.
- Do not spray 1 week before harvesting to avoid pesticide residues in cured leaves.
- **Resistance** : high levels of carboxyl esterase enzyme is responsible for insecticide resistance for almost all **OP** and **Carbamate** insecticide
- Higher enzymes activity in **pink forms** compared to green forms of aphids
- **Acephate** and **Methomyl** are effective against these aphids

9. Tobacco bud worm or Capsule borer

S.N: *Helicoverpa armigera*
(Noctuidae: Lepidoptera)

- **Adult** is a medium sized stout bodied moth with fore wings light brown with black spots and hind wings are creamy white with black patch along the margin.
- **Eggs:** are laid singly on tender leaves, shoot and inflorescence. (I.P – 3-4 days).
- **Larva:** Larva passes 5-6 instars, measures 3.5 to 4.0 cm in length, variously coloured / different colour morphs, pale green, dark green, pale brown, dark brown and can be recognized by a yellowish line on either side of the body (L.P – 20-30 days)
- **Pupa:** in the earthen cocoon in the soil. (P.P – 17-24 days)



Nature of Damage

- **The crop is 30 to 40 days old – The larva feed on tender shoots, leaves/ inflorescence/ buds**
- **Later bores in to the capsules and feeds on developing seeds.**
- **The pest is active during early morning hours**
- **While feeding on capsule it thrust head and thorax inside and remaining body outside**
- **It is active during the early hours of the morning.**
- **For management refer cotton**





Bored capsules of tobacco

10. Tobacco hornworm

S.N: *Manduca sexta*

(Sphingidae: Lepidoptera)

- **Hornworms feed primarily on solanaceous plants (those in the potato family).**
- **They include tobacco, tomato, eggplant, pepper and some weedy plants.**
- **Tobacco and tomato plants are more preferred**





1cm

Nature of Damage

- **Caterpillars feeds on leaves causes severe defoliation**
- **Control measures**
- **Spray the crop with contact insecticides**





Thank
You!