Pest of crops & stored grains and their management

PEST OF RICE

Major Pests

Common name	bot. name	family	order	Damage symptom	host range	Management
1) Thrips	Stenchaetothrips biformis	Thripidae	Thysanoptera	• both nymphs & adults suck the plant sap. • Terminal rolling & drying of leaves from tip to base. • both in nursery & main field.	Echinochloa sp.	1) Spray Endosulfan 35 EC 80 ml / 800 m^2 nursery. 2) Spray Endosulfan 35 EC 1 l in 500 l water / ha. 3) grow resistant cultivars like PTB-12, PTB-20, PTB-321, H4.
2) Green leaf hopper	Nephotettix virescens N. nigropictus N. cincticeps	Cicadellidae	Hemiptera	• both nymphs & adults desap the leaves & cause "hopper burn" due to heavy infestation. • yellowing of leaves from tip to downwards. • transmits tungro virus.	rice millets grasses.	1) resistant varieties like IR-20, IR-50, Vikramarka, nidhi, lalit. 2) apply neem cake @ 1.25 kg / 800 m^2 nursery as basal dose. 3) Spray Endosulfan 35 EC 1 l in 500 l water / ha.
3) BPH (Brown Plant Hopper)	Nilaparvata lugens	Delphacidae	Hemiptera	• nymphs & adults such the sap from tillers • affected plant dries up and gives scorched appearance "hopper burn". • Circular patches of drying and lodging of matured plants.	rice sugarcane grasses.	1) resistant varieties like CO-46, CO-42, Divya, Neela, MTU1249, Shyraksha, Chaitanya. 2) spray Imidaclopid 17.8 SL 125 ml / ha. 3) ~~me~~ neem oil (2%) (10 l / ha)

common name	Bot. name	family	order	Damage symptom	host range	Management
4) Mealy Bug.	Brevennia rehi.	Pseudococcidae	Hemiptera	• affect plants in circular patches. • insect remains in leaf sheath & suck sap • plants become weak, yellow & stunted. • white waxy fluff in leaf sheath.	-rice -graminaceous weeds.	1) Spray Dimethoate 30 EC @ 500 ml/ha. 2) rouging 3) parasitoid such as Adelencyrtus sp.
Minor Pests						
5) White rice leaf hopper.	Cofana spectra	Cicadellidae	Hemiptera	• nymps & adults such sap • causing yellowing of leaves and ~~tillers~~ stunting of tillers.		1) Endosulfan 35 EC.
6) Rice Earhead Bug / Rice gundhi Bug.	~~Lepto~~ Leptocorisa acuta	Alydidae	Hemiptera	• nymps & adults such sap from individual grains at milky stage • grains become chaffy with black spots at site of feeding. • obnoxious odour on disturbing bugs.		1) Endosulfan 35 EC

PEST OF WHEAT

Major Pests

Common name	Bot name	family	order	Damage symptoms	host range	Management
1) Wheat aphid	Macrosiphum miscanthi	Aphididae	Hemiptera	• nymphs & adults suck the sap from ears during cold & cloudy weather.	wheat, barley, oats, Cynodon dactylon.	• monocrotophos 36SL in 500 l water/ha.
2) Gram pod borer.	Helicoverpa armigera	Noctuidae	lepidoptera	• attacks wheat at maturity • feeds on grains in ear heads • damage is more where wheat follows cotton.	wheat, barley, oat, gram.	• spray 3kg of Carbaryl 50 WP in 500 l water/ha.
3) Molya nematode/ cyst nematode	Heterodera avenae	Heteroderidae	Tylenchida	• attached plants remain stunted and gives shriveled unhealthy appearance • formation of branched rootlets. • main root is short, bunchy & have galls.	wheat barley oats rye.	• apply Carbofuran @ 45 kg/ha • plough 2-3 times in summer • Resistant variety wheat Raj MR-1 • Crop rotation

PEST OF MAIZE (ZEA MAYS)

Major Pests

Common name	bot. name	family	order	Damage symptom	host range	Management
1) Maize Shootfly.	Atherigona orientalis	Muscidae	Diptera	• maggot feeds on young growing shoots causing "dead hearts".	maize Sorghum ragi bajra.	1) resistant cultivars DMR-5, NCD, VC-80. 2) furrow application of Lindane 6g 25kg/ha.
2) Stem borer	Chilo partellus	Crambidae	Lepidoptera	• causes "dead hearts". • bore holes are visible on stem near nodes • young larvae feeds on tender folded leaves causing "shot hole".	jowar bajra sugarcane rice.	1) resistant cultivars like Him-123, Decan 101, Decan-103, ganga 4, 5, 7, 9, ganga safed-2. 2) light trap, intercrop, chemical combination. 3) sow lab-lab or cowpea as an intercrop.
3) Corn worm/ Ear worm/ Gram pod borer.	Helicoverpa armigera	Noctuidae	Lepidoptera	• larva feeds on silk and developing grains.		1) apply at silk drying stage Carbaryl 10 D 25 kg/ha. in 500 lg water Repeat after 15 days.

Minor Pest

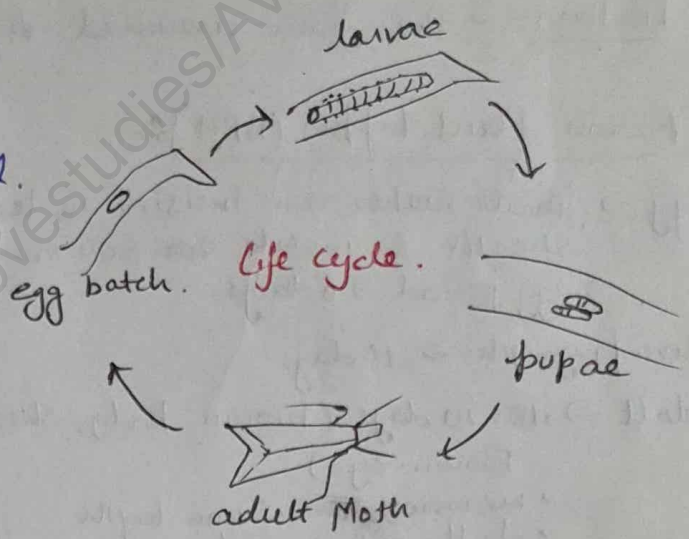
4) leaf hopper.	Pyrilla Perpusilla	Lophopidae	Hemiptera	

BIONOMICS OF INSECTS

1) Stem borer (34-77 days)

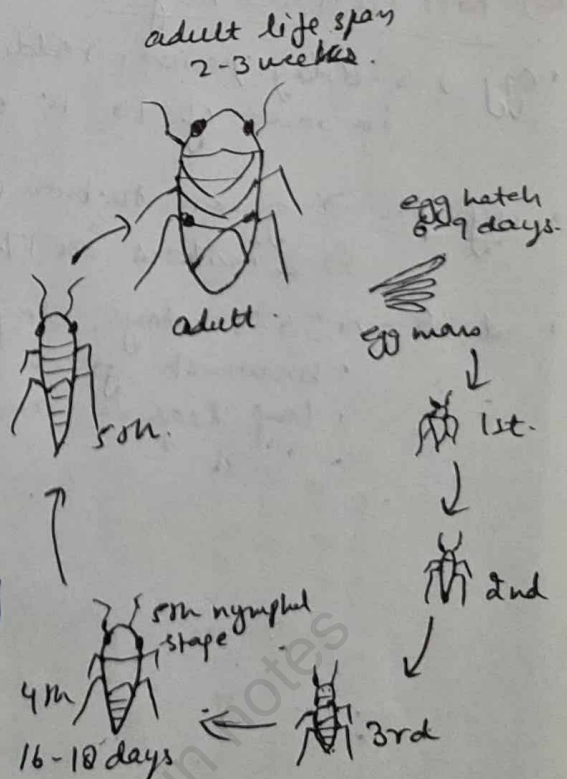
Chilo partellus

- adult moth → medium size & straw coloured.
- lays flat oval eggs in batches on under surface of leaves
- 25 eggs / female.
- 2-5 days - incubation period.
- Larva - yellow-brown + brown head eats midrib by mines and enter stem feed on internal tissues.
- larva period → 25-80 days with 7 instars.
- Pupates in stem for 2-15 days.
- adult → for 2-12 days.



2) Paddy stem borer (60-70 days)

- eggs → · long whitish egg (100-200 eggs) in clusters
  · 80-150 eggs / cluster. near tip on upper surface of leaves
  · covered by brownish hair.
- larvae → hatch in 1 week (7 days → incubate)
  · feed on leaves & then bore into stem.
  → · Period for 4-5 weeks.
  · hibernates in stubbles.
- Pupa → in stem for 8-10 days.
- Adult → for 2 months (yellow brown colour)



3) Green leaf hopper (Nephotettix virescens)

- eggs → female inserts eggs on two rows on either side of midrib of leaf sheath
  → female lays 420 eggs in 44 egg masses
  → incubation - 4-8 days.
- larvae / nymph → into adult in 15-20 days passing through 4 to 5 nymphal instars.
- adult → one generation completes in 18-25 days
- There are about 6 overlapping generations from March to November.
- over winters in adult stage.

(37-53 days)

Stadium – The time interval b/w two subsequent moths

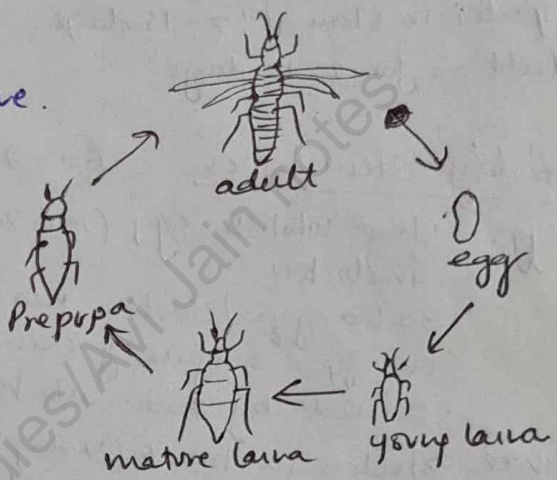
Instars – The form assumed by insect in any stadium.

4.) Brown Plant hopper (BPH) :-

- egg → female makes an incision in leaf sheath & inserts 200-350 small eggs
  → egg period → 6 days.
- larva/nymph → 15 days
- adult → 10-20 days (brown body, chestnut brown eye)
  - measures 4-4.5 mm length
  - drift with wind
  - forms → macropterous (long winged)
    → brachypterous (short winged)

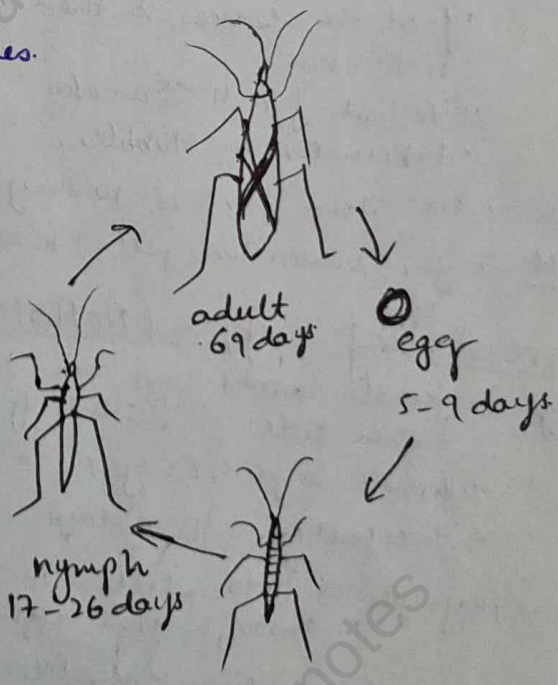
5.) Thrips

- eggs → female inserts eggs singly within leaf tissue in young leaves
  → 3-5 days egg period.
- adults → dark brown
- life cycle → 13-19 days



6) Rice earhead bug

- egg → 5-8 days period, reddish brown in rows of 10-15 on leaves/panicles.
- nymph → green to brown
  → 5 instars in 17-27 days.
- adults → 30-50 days, long lived
  - brownish green adults
  - long legs & antennae

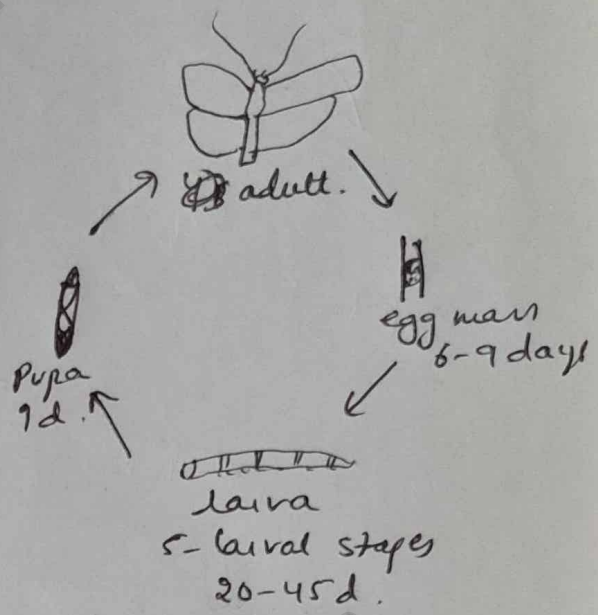


7) Yellow stem borer 6 –

- eggs → 170 - 200 eggs by each female
  - 15-80 egg mass on upper surface of leaf tips covered with buff coloured hairs.

6-9 days

- adults → female → bright yellowish-brown forewings with black spot & tuft of yellow anal hairs. and
  - → male → smaller with pale yellow forewings without black spot.
- larva → pale yellow, dark brown head.
  - migrates to other tillers also.
  - 20 - 45 days.
- pupa → in white silken coccoon.
  - pupa dark brown
  - 6 - 10 days period.



8) Leaf folder / leaf roller :-

- eggs - flat, oval, yellowish-white colour
  - 4-7 days period.
  - lays eggs in batches of 10-12 linear rows in lower leaf surface.
- larvae - 15-20 mm long, pale green, translucent, active
  - 15-20 days period,
  - pupates inside leaf fold.
- Pupa - greenish brown, 6-8 days.
- Adult - seen in day time, brownish (dark wavy lines in centre) dark band of margin of wings

total life cycle → 25-35 days.