RAMA UNIVERSITY

www.ramauniversity.ac.in

FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Lecture-4

PESTS OF RICE – BORERS AND FOLIAGE FEEDERS

5. Rice case worm:

Nymphula depunctalis (Pyraustidae: Lepidopera)

Distribution and Status: India, South East Asia, Australia

Host plant: Rice

Damage symptoms: The caterpillars feed on green tissues of the leaves and form tubular cases around them by cutting the apical portion of leaves, which float on water. Several tubes are also seen hanging from the plants. In case of severe infestation plants are unable to grow. They damage leaf tips. The apical portion of cut leaves bear whitish papery areas since the chlorophyll is scrapped.

Bionomics:

Adult is a delicate white moth with pale brown wavy markings. Eggs are laid on leaves. Egg period is 2-6 days. Larva is pale translucent green with orange head. Larva constructs a case. Larval period is 14-20 days. Larva has filamentous gills on the sides of the body that helps to lead a semi aquatic life. It pupates in case it self for 4-7 days. The total life cycle occupies 19-37 days.

Management

1. Conserve larval parasitoids viz., *Elasmus* sp., *Apanteles* sp., *Bracon* sp.,

2. Conserve pupal parasitoids viz., *Pediobius* sp., *Apsilops* sp., *Eupteromalus parnarae*

3. Drain water from the field

4. Dislodge the cases by running a rope over the young crop

5. Spray endosulfan 35 EC or monocrotophos 36 SL 1.0 L or phenthoate 50 EC 1.0 L in 500 L water/ha.

6. Rice skipper:

Pelopidas mathias (Hesperiidae: Lepidoptera)

Distribution and status: India, South East Asia, China, Africa

Host range: Rice, Sugarcane Damage symptoms Edges of the leaves are fastened with webbing. Backward rolling of leaves, feeding from margin inwards are symptoms of damage.

Bionomics Adult butterfly has brown coloured wings and curved antennae. Eggs are laid singly on the leaf blades. Larva is pale green with constricted neck.

7. Spiny beetle / Rice hispa:

Dicladispa armigera (Chrysomelidae: Coleoptera)

Distribution and status: Bangladesh, Burma, Southern China, India, West Malaysia, Nepal, Pakistan, Sumatra, Thailand, West Iran.

Host range: Rice Damage symptoms Adults feed on chlorophyll by scraping and cause white parallel streaks (or) white patches along the long axis of leaf. Grubs mine into the leaves and make blister near leaf tips.

Bionomics: Adult is blue - black shiny beetle with spines on the thorax and elytra. It lays eggs singly on the leaf tip. Grub is minute, flat and yellow. It mines between the epidermal layers of leaf and pupates in leaf mines. Egg period: 4-5 days; Larval period: 7-12 days; Pupal period: 3-5. There are six generations / year.

Management

1. The leaf tips containing blotch mines should be plucked and destroyed.

2. Manual collection and killing of beetles with hand nets may help in reducing the population of the pest.

3. Dust the crop with 10% BHC dust @ 30 kg/ha at least two times at an interval of 40 days.

4. Spray endosulfan 1.0 L or lambda-cyhalothrin 2.5 EC 500 ml / EC 250 ml in 500 L water/ha. ays. There are six generations / year.

8. Whorl maggot:

Hydrellia sasakii (Ephydridae: Diptera)

Distribution and status: Philippines

Host range: Rice, *Cyanodon dactylon* and *Echinochloa crusgalli*

Damage symptoms: Yellowish white longitudinal marginal blotching with hole in a few places on the emerging leaves. Leaves become shriveled. Plant gets stunted and maturity is delayed. Maximum damage is observed on 30 DAT.

Bionomics: The adult is a small dull grey fly. Maggot is 2 mm in length and feeds on the tender tissue inside the whorl. It is yellowish white in colour.

Management

1. Apply carbofuran 3G 10 kg or cartap hydrochloride 4 G 18.75-25.0 kg or fipronil 0.3 G 16.70 - 25.0 kg shortly after transplanting.

2. Spray endosulfan 35 EC 1.0 L or quinalphos 25 EC 1.0 L or ethofenoprox 10 EC 500-750 ml or fipronil 5 SC 1.0 -1.5 L or in 500 L water/ha.

9. Rice horned caterpillar:

Melanitis ismene (Satyridae, Lepidoptera)

Distribution and status: Throughout India

Host range: Rice, Millets

Damage symptoms: The larva of this butterfly feeds on leaf blades of rice. Leaves are defoliated from the margin or tip irregularly.

Bionomics The butterfly lays round white eggs singly on the leaves. The caterpillar is green, slightly flattened with two red horn processes on the head and two yellow processes in the anal end. It pupates in a greenish chrysalis, which suspends from the leaf. The butterfly is dark brown with large wings having a black and yellow eye like spot one on each of the fore wings.

MINOR PESTS

11. Grasshopper:

Hieroglyphus banian (Acrididae: Orthoptera)

Damage symptoms: The nymphs and adults cause enormous loss to the crop by chewing and cutting various plant portion viz., leaves, flowers and grains. They completely defoliate the plants leaving only the mid ribs and the plant growth is affected.

Bionomics Adults are green, larger with transverse black lines on pronotum. It lays eggs in soil at a depth of 5 cm. Nymphal period is from 2.5 - 3.5 months

Management

1. Expose the eggs to be picked up by birds after ploughing and trimming the bunds

2. Egg parasitoids *Cacallus* spp., *Barycomus* spp. and *Seelio* spp., should be encouraged.

3. Dust the crop with 5-10% BHC (or) methyl parathion 2% or lindane 2 D 25-30 kg/ha (or) malathion 5 D 20 kg/ha 4. Spray dichlorvos 76 EC 500 ml/ha (or) malathion 50 EC 2.5 lit/ha.

12. Short horned grasshopper:

Oxya nitidula (Acrididae: Orthoptera)

Damage symptoms Nymphs and adults feed on leaves leaving the stalks and midribs. Irregular feeding on seedlings and cutting of stem at panicle stage are the symptoms of damage.

Bionomics: Grasshopper is green, smaller with brown band on sides. Eggs are laid in soil which hatch out in June - July and mature in August - September.

Management Expose the eggs during summer ploughing so that they are picked up by birds.

13. Blue beetle:

Halticia cyanea (Chrysomelidae: Coleoptera)

A medium sized steel blue beetle often found in large numbers on rice but is harmless as it breeds on the common weed, *Ammania* sp., found in wetlands.

14. Rice root weevil:

Echinocnemus oryzae (Curculionidae: Coleoptera)

Damage symptoms: Grubs feed on the roots of rice plants resulting in stunting and non formation of tillers. Presence of dead plants in large patches is a typical symptom.

Bionomics: The adult weevil is shiny black with oblong body covered with greyish scales. The female lays eggs in soil near the roots of grasses. The incubation period is 3-4 days. The grub is creamy white, aquatic and feeds on root hairs. The larval period lasts for 11 months. The grub over-winters in soil at a depth of 25-30 cm, after September. It pupates during May. The pupal period is 10-12 days.

15. Rice root weevil:

Hydronomidus molitar (Curculionidae: Coleoptera)

Damage symptoms: Yellowing of newly transplanted seedlings and presence of dead plants in large patches.

Bionomics: Adult is shiny black weevils with oblong body covered with greyish scales. Grub is creamy white and aquatic.

16. Rice root grub:

Arthrodeis sp., (Tenebrionidae: Coleoptera)

Damage symptoms: They feed on roots and cause yellowing and gradual wilting of entire plants. Bionomics Black coloured shiny beetle.

Integrated Pest Management in Rice

A. Cultural method

1. Remove / destroy stubbles after harvest and keep the field free from weeds.

2. Trim and plaster the bunds of rice field to expose the eggs of grasshoppers and to eliminate the bug breeding in grasses.

3. Form the bunds narrow and short to reduce the damage by rodents.

4. Use resistant varieties wherever available.

5. Provide effective drainage wherever there is problem of BPH.

6. Clip the tip of seedlings before transplanting to prevent the carry over of egg masses of rice yellow stem borer from nursery to mainfield.

7. Organise synchronized planting wherever possible.

8. Leave 30 cm rogue space at every 2.5 m to reduce damage by BPH and rodents.

9. Avoid use of excessive nitrogenous fertilizers.

10. Use irrigation water judiciously (Alternative wetting and drying reduce BPH and case worm).

11. Remove the egg masses of stem borer in the main field.

B. Mechanical methods

1. Dig out the rat burrows and destroy the rats and young ones at the beginning of the season.

2. Set up light traps to monitor and control pests.

3. Set up-bow traps to kill rodents.

C. Biological methods

1. Release *Trichogramma japonicum* twice on 30 and 37 DAT @ 5 cc/ha/release against stem borer.

2. Release *Trichogramma chilonis* on 37, 44 and 51 DAT (thrice) @ 5 cc/ha/release against leaf folder.

3. Release of *Platygaster oryzae* parasitized galls @ 1 per 10 m2 in the mainfield on 10 DAT against gall midge.

4. Set up owl perches to reduce rat damage.

D. Plant products

1. Spray neem seed kernel extract 5% (25 kg/ha), neem oil 3% (15 lit/ha) to control brown planthopper.

2. Spray botanicals viz., NSKE, Vitex negundo (Notchi), Prosopis juliflora and Ipomoea carnea leaf extract 5% to control earhead bug and black bug.

E. Chemical methods

1. In BPH prone area / season avoid use of synthetic pyrethroids, methyl parathion and quinalphos and use recommended chemical at recommended doses.

2. Use insecticides based on ETL.