

Lecture 29: IPM (Integrated Pest Management) for Rice

1. Avoid use of excess nitrogenous fertilizer which induces BPH and leaf folder
2. Remove/destroy stubbles after harvest
3. Trim field bunds and keep field free from weeds
4. Control irrigation by intermittent draining to manage BPH (Alternate wetting and drying of field)
5. Avoid close planting, especially in BPH and leaf folder prone areas/seasons
6. Provide rogue spacing of 30 cm at every 2.5 m interval to take up plant protection operation
7. Use light traps to monitor incidence of pests
8. Avoid resurgence inducing chemicals against BPH like Methyl parathion and quinalphos
9. Remove stem borer egg masses by dipping off tip of rice seedling during transplanting
10. Select and use resistant varieties against major pests
11. Manage caseworm by passing rope on crop and draining water
12. Release egg parasitoid *Trichogramma japonicum* on 30 and 37th day after planting against stem borer
13. Release egg parasitoid *T. chilonis* and bacteria *Bacillus thuringiensis* against leaf folder
14. Use of Neem Seed Kernel Extract 5% (NSKE 5%) or Neem oil 2% against Earhead bug
15. Use insecticides as need based application if pest reaches ETL

| S.No. | Pest (on rice) | ETL |
|-------|--------------------------|--|
| 1. | Thrips | 25/5 passes of wet palm |
| 2. | Stem borer | 10% Dead heart or 2% white ear |
| 3. | Gall midge | 10% Silver shoot |
| 4. | Leaf folder | 10% leaf damage (at vegetative stage) 5% leaf damage (at Bootleaf stage) |
| 5. | GLH | 5/hill at vegetative stage, 10/hill flowering stage, 2/hill in RTV endemic areas |
| 6. | BPH (Brown Plant Hopper) | 1/tiller; 2/tiller when spider present at 1/hill |
| 7. | Earhead bug | 5 bugs/100 panicle - Flowering stage 16 bugs/100 panicle - Milky stage |

IPM FOR COTTON

1. Selection and use of resistant/tolerant varieties against major pests
2. Use of light trap to monitor hoppers, bollworms, cutworm
3. Use of pheromone traps for monitoring/mass trapping bollworms
4. Collection and destruction of infested plant parts, squares and bolls
5. Growing trap crop (e.g.) Castor for *Spodoptera litura*
6. Manual collection and removal of egg masses of *S. litura*
7. Hand picking of bollworm larvae
8. Use of insect viruses SINPV and HaNPV against *Spodoptera litura* and *Helicoverpa armigera* respectively
9. Avoid ratoon and double cotton crop
10. Avoid staking of stalks in the field
11. Synchronise sowing time at village level
12. Follow crop rotation with unrelated crops
13. Removal of alternate hosts
14. Judicious use of nitrogen and water to manage hoppers and white flies
15. Use of yellow sticky traps for whiteflies
16. Observe IRM (Insecticide Resistance Management) practices like
 - a. Treat seeds with Imidacloprid 7.5 g/kg seed of cotton to manage early stage sucking pests
 - b. Use of predators like *Chrysoperla carnea*
 - c. Use of egg parasitoid *Trichogramma* sp. against bollworms
17. Apply insecticides only based on need, when pest population/damage reaches ETL

| S.No. | Cotton pest | ETL |
|-------|--------------------------|----------------------------------|
| 1. | Leaf hopper/thrips | 50 nos./50 leaves (or 1/leaf) |
| 2. | Whitefly | 5 nymphs/leaf |
| 3. | Bollworms | 10% damage of reproductive parts |
| 4. | Stem weevil | 10% infested plants |
| 5. | <i>Spodoptera litura</i> | 8 egg masses/100 m row |