IPM IN GROUNDNUT
Insect Pests of Groundnut

- Defoliators
- Sucking pests
- Root and Pod feeder
Defoliators

Leafminer, *Aproaerema modicella* (Lepidoptera: Gelechiidae)

**Damage Symptoms**

- Young larvae mine into leaflets and form brown blotches on leaf
- Later stages web leaflets together and feed remaining within folds
- Severely attacked field looks "burnt" from a distance
Tobacco caterpillar, *Spodoptera litura* (Lepidoptera:Noctuidae)

**Damage Symptoms**

- Freshly hatched larvae feed gregariously, scraping chlorophyll
- Larvae feed by making small holes on the leaf
- Sometimes feeding is heavy - only petioles and branches

Egg  Larvae  Pupa
Bihar hairy caterpillar: *Spilosoma (Spilarctia) obliqua* (Lepidoptera: Arctiidae)

**Damage Symptoms**

- Young larvae feed gregariously on the under surface of leaves
- Feed on leaves and cause loss by defoliation
- In severe cases only stems are left behind
Gram pod borer, *Helicoverpa armigera* (Lepidoptera: Noctuidae)

**Damage Symptoms**

- Larvae feed on the foliage, prefers flowers and buds
- When tender leaf buds are eaten symmetrical holes or cuttings upon unfolding of leaflets
Red hairy caterpillar, *Amsacta albistriga, A. moorei* (Lepidoptera: Arctiidae)

**Damage Symptoms**

- Young larvae feed gregariously on under surface of leaves by scrapping
- Larvae are voracious feeders, defoliate the crop - cattle grazed field
- Feed on leaves, flowers and growing points
Sucking pests

Aphids, *Aphis craccivora* (Homoptera: Aphididae)

Damage Symptoms

- Sucks saps from young leaves, leaf buds and flowers
- Stunting and distortion of the foliage and stems
- Excrete honeydew on which sooty molds flow forming a black coating
- Vector for peanut stripe virus and groundnut rosette virus complex
Thrips, *Scirtothrips dorsalis*, *Frankliniella schultzei*, *Thrips palmi*, *Caliothrips indicus* (Thysanoptera: Thripidae)

Damage Symptoms

- Tender leaves showing yellowish green patches on the upper surface and brown necrotic areas and silvery sheen on the lower surface
- Severe infestations cause stunted plants
Primary Symptoms of PBND
Leafhopper (Jassid), *Empoasca kerri* (Homoptera: Cicadellidae)

**Damage Symptoms**

- Nymphs and adults inject toxins resulting in whitening of veins and chlorotic patches especially at the tips of leaflets
- Crop looks yellow and gives a scorched appearance known as 'hopper burn'

[Images: Adult leafhopper and Damage]
Root and pod feeders

White grub, Holotrichia consanguinea and H. serrata 
(Coleoptera: Scarabidae)

Damage Symptoms

• Grubs feed roots and damage pods

• Grubs feed on fine rootlets - wilted plants, dying in patches
Termite, *Odontotermes* sp. and *Microtermes* sp. (Isoptera: Termitidae)

**Damage Symptoms**

- Wilting of plants in patches
- Termites penetrate and hollow out tap root and stem thus kill the plant
- Bore holes into pods and damage the seed
Jewel beetle, *Sphenoptera indica* (Coleoptera: Buprestidae)

**Damage Symptoms**

- Wilting of plants in patches
- Grub burrows into stem close to soil surface and kills plant
- Infested fields show dead and dying plants, which when pulled up and examined grub/pupa can be seen in hollowed stem
Wireworms (Coleoptera: Elateridae)
False wireworms (Coleoptera: Tenebrionidae)

Damage Symptoms

- White or cream, shiny, hard bodied larvae
- Feed on roots and pods

Earwig, *Anisolabis stali* (Dermaptera: Forficulidae)

Damage Symptoms

- Nymphs and adults bores developing pods & feed on seeds
IPM in Groundnut

Cultural practices

- Use of trap crops such as cowpea/soybean (for leafminer and leafhopper) and castor (for *Spodoptera*) as border crops

- Growing tall crops like pearlmillet, sorghum or maize as border to reduce the incidence of thrips, vector for peanut stem necrosis disease

- Vegetative trapping of RHC with twigs of Jatropha or Calotropis; neem branches for trapping adult white grubs
Mechanical control

• Collection and destruction of egg masses, early instar larvae (mesh like leaves with larvae) of *Spodoptera*, *Spilosoma*; late instar larvae of *Helicoverpa* and defoliators

• Erection of bird perches @ 10-12/ac
Behavioural / Botanical and Biological Control

- Pheromone traps @ 10 traps/ha for *Spodoptera* and *Helicoverpa* and 25 traps/ha for leafminer or Light trap (RHC)

- Spraying NSKE5% or commercial neem formulations or neem oil @5 ml/l with nirma powder 1g/l – defoliators and sucking pests

- Spray Sl NPV / HaNPV 250 LE/ha or *Bacillus thuringiensis* @ 1 g/l against *Spodoptera litura* and *H. armigera*

- *Nomuraea rileyi* – spraying 2 x 10^{11} conidia/l – *Spodoptera*
## ETLs for important insect pests of groundnut

<table>
<thead>
<tr>
<th>Pest</th>
<th>ETL Description</th>
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</thead>
<tbody>
<tr>
<td>Leafmininer</td>
<td>5 mines/plant up to 30 DAS</td>
</tr>
<tr>
<td></td>
<td>10 mines/plant up to 45 DAS</td>
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<tr>
<td></td>
<td>15 mines/plant up to 55 DAS</td>
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<tr>
<td><em>Spodoptera</em> and Other defoliators</td>
<td>20-25% defoliation up to 40 DAS</td>
</tr>
<tr>
<td>Leafhopper</td>
<td>5 to 10 adults/plant up to 30 days</td>
</tr>
<tr>
<td>Thrips</td>
<td>5 adults/terminal bud</td>
</tr>
</tbody>
</table>
Chemical control

- **Leafminer, Defoliators & Hairy caterpillars**: Spraying Quinalphos 2ml/l or Chlorpyriphos 2.5ml/l or Thiodicarb 1.5g/l; Dusting Quinalphos 1.5% @ 25kg/ha

- **Sucking pests (Aphid, Jassid, thrips)**: Seed treatment with imidacloprid @ 2 ml/kg; Spray imidacloprid or acetamiprid @ 0.3ml/l

- **White grub**: Seed treatment with Chlorpyriphos20EC @ 6ml/kg; Soil treatment with phorate 10G 15 kg/ha
<table>
<thead>
<tr>
<th>Insecticides</th>
<th>Insect Pests</th>
<th>Dosage</th>
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</thead>
<tbody>
<tr>
<td>Diflubenzuron 25% WP</td>
<td>Tobacco caterpillar, Leaf webber</td>
<td>0.75 ml/l</td>
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<tr>
<td>Dichlorvos 76% EC</td>
<td>Red hairy caterpillar</td>
<td>0.75 ml/l</td>
</tr>
<tr>
<td>Quinalphos 20% AF</td>
<td><em>Spodoptera</em></td>
<td>1.8 ml/l</td>
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<tr>
<td>Malathion 50% EC</td>
<td>Leaf miner</td>
<td>1.25 ml/l</td>
</tr>
<tr>
<td>Deltamethrin 2.8% EC</td>
<td>Leaf miner</td>
<td>1 ml/l</td>
</tr>
<tr>
<td>Phosalone 35% EC</td>
<td>Leaf webber</td>
<td>1.5 ml/l</td>
</tr>
<tr>
<td>Phenthoate 50% EC</td>
<td>Leaf webber</td>
<td>1 ml/l</td>
</tr>
<tr>
<td>Quinalphos 25% EC</td>
<td>Leaf miner, Leafhopper, Thrips</td>
<td>1.4 ml/l</td>
</tr>
<tr>
<td>Lambda-Cyhalothrin 5% EC</td>
<td>Leaf miner, Thrips, Leafhopper</td>
<td>0.6 ml/l</td>
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<tr>
<td>Oxydemeton–Methyl 25% EC</td>
<td>Leaf miner, Aphid</td>
<td>1 ml/l</td>
</tr>
<tr>
<td>Insecticides</td>
<td>Insect Pests</td>
<td>Dosage</td>
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<tr>
<td>Imidacloprid 17.8% SL</td>
<td>Aphid, Jassid</td>
<td>0.3 ml/l</td>
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<tr>
<td>Dimethoate 30% EC</td>
<td>Whiteflies</td>
<td>1.7ml/l</td>
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<tr>
<td>Carbofuran 3% CG</td>
<td>Pod borer, White grub</td>
<td>33 kg/ha</td>
</tr>
<tr>
<td>Phorate 10% CG</td>
<td>Aphid, Leaf miner, White grub</td>
<td>15 kg/ha</td>
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<td></td>
<td>25 kg/ha</td>
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<tr>
<td>Phosalone 4% DP</td>
<td>Leaf Webber</td>
<td>20kg/ha</td>
</tr>
<tr>
<td>Quinalphos 1.5% DP</td>
<td>Thrips, Jassids, Red hairy Caterpillar</td>
<td>23 kg/ha</td>
</tr>
</tbody>
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Groundnut - Varieties released / Recommended

- **Kharif**: TPG-41, TG 37A, Narayani (TCGS 29), Kalahasti (TCGS 320), Kadiri 5, Vikas (GPBD 4), Kadiri 6, Kadiri 7, Kadiri 8, Kadiri 9, Prasuna (TCGS 341), Abhaya (TPT 25), GG 16 (JSP 39), ICGV 91114, AK 265, Ajeya (R 2001-3), ICGV 00348, VRI (Gn) 6, Greeshma, Mallika (ICHG 00440), JSP-39, Bheema, Rohini, ICGV-00350

- **Rabi-Summer**: Narayani (TCGS 29), Kalahasti (TCGS 320), TG 37A, Prutha (Dh 86), Abhaya (TPT 25), VRI (Gn) 6, Greeshma, Kadiri 8, JSP-39, Vijetha (R 2001-2), Bheema, Rohini, ICGV-00350