



## Optimizing Groundnut Pest Management: Effective Sampling Techniques for Key Insect Pests

(\*Chaitanya B. Police Patil and Kishore S. M.)

Ph.D. Scholar, Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shivamogga

\*Corresponding Author's email: [chavento@gmail.com](mailto:chavento@gmail.com)

In India, groundnut (*Arachis hypogea*) is a vital crop, contributing significantly to the agricultural economy and serving as an essential source of food, oil, and feed. However, groundnut cultivation faces numerous challenges, with insect pests being among the most significant threats. These pests not only diminish crop yields but also adversely affect the overall health and vitality of the plants. Insects such as aphids, thrips, jassids, leaf miners, caterpillars, and pod borers can cause extensive damage if left unmanaged, leading to substantial economic losses for farmers. Given the critical importance of groundnut as a crop, effective pest management strategies are essential. Such strategies depend on accurate and systematic monitoring of pest populations and the extent of crop damage. Without precise data, it is challenging to determine the appropriate timing and methods for pest control, leading to either under-treatment, which allows pests to proliferate, or over-treatment, which can be costly and harmful to the environment. The need for targeted pest management has become more urgent as agricultural practices evolve and climatic conditions change, potentially altering pest behavior and population dynamics. This highlights the necessity of adopting robust sampling methods that can accurately assess the presence and severity of pest infestations, enabling farmers to implement timely and effective control measures.

### Key Pests and Their Impact

1. **Aphids (*Aphis craccivora*):** Aphids are small sap-sucking insects that can cause considerable damage to groundnut plants. They feed on the plant's sap, leading to stunted growth, curled, and distorted foliage, which in turn affects the plant's ability to photosynthesize effectively, reducing overall vigour and yield.

#### Sampling method:

- **Number of plants infested:** Count the number of aphid infested plants out of 10 plants in the selected spot and record.
- **Severity of infestation:** Assess the severity of infestation by selecting one of the maximum infested plants among the 10 observed plants in the spot on a 0-3 scale based on the approximate number of aphids present on the plant.

Scale	Number of aphids
0	Nil
1	1-25
2	26-50
3	>50

2. **Thrips (*Scirtothrips dorsalis*, *Thrips palmi*):** Thrips feed by puncturing plant cells and sucking out their contents, leading to silvering or browning of leaves, distorted growth,

and scarring on the plant surfaces. This damage can severely affect the photosynthetic efficiency of the plant.

**Sampling method**

**Number of insects:** Count the number of nymphs and adults present in top three open leaves of one plant in the selected spot.

**Number of plants with feeding patches:** Count the number of thrips infested plants out of 10 plants of a spot showing whitish or greenish yellow patches or dark brown patches on upper surface and dark brown necrotic patches on lower leaf surface.

3. **Jassids (*Empoasca kerri*):** Jassids, or leafhoppers, cause a condition known as "hopper burn," where the leaves turn yellow, curl, and eventually dry up. This can lead to significant reductions in plant vigour and yield.

**Sampling method**

**Number of insects:** Count the number of nymphs and adults present in top three open leaves of any one plant in each selected spot.

**Number of plants with yellowing:** Count the number of plants showing yellowing on leaf tips with typical V shaped mark/ severe yellowing/hopper burn" out of the 10 plants of each selected spot and record.

4. **Leaf Miners (*Proaerema modicella*):** Leaf miners burrow into the leaves, creating visible trails or mines that can reduce the plant's photosynthetic area, weakening the plant and making it more susceptible to other stressors.

**Sampling method:** To track leaf miner populations, count the number of live larvae within the leaf mines and record the number of plants showing signs of infestation.

5. **Tobacco Caterpillars (*Spodoptera litura*):** Tobacco caterpillars are highly destructive, feeding on the leaves and causing extensive defoliation, which can lead to severe yield losses if not controlled.

**Sampling method:**

**Egg mass and gregarious larvae:** Count the number of egg masses as well as gregarious larvae together on all 10 plants in a spot and record.

**Solitary larvae:** Count the number of solitary larvae on all 10 plants in a spot (Look at the base of the plants and also on soil surface, while recording solitary larvae).

**Number of infested plants:** Count the number of damaged plants per spot out of 10 plants on which infestation and damage due to *Spodoptera* are seen.

6. **Red Hairy Caterpillars (*Amsacta albistriga*, *A. moorei*) and Semi-loopers:** These caterpillars also contribute to defoliation, feeding on the leaves and sometimes the pods, reducing the plant's ability to produce and store energy.

**Sampling method:** Count the number of larvae present on the plants and assess the extent of leaf damage to determine if control measures are necessary.

7. **Pod Borers (*Helicoverpa armigera*):** Pod borers attack both the flowers and the pods, leading to significant yield losses. They are particularly damaging because they can directly affect the part of the plant that produces the crop.

**Sampling method:** Monitor the crop for the presence of pod borer larvae, especially on flowers and developing pods, and document the level of infestation.

**Importance of Monitoring Natural Enemies:**

In addition to monitoring pest populations, it is crucial to track the presence of natural enemies, such as coccinellids (lady beetles) and spiders, which play a vital role in biological control. These natural predators can help keep pest populations in check, reducing the need for chemical interventions.

## Conclusion

The success of groundnut cultivation in India hinges on the ability to manage insect pests effectively. The diversity and complexity of pest species affecting groundnut crops necessitate a detailed and methodical approach to monitoring and management. By utilizing precise sampling techniques to assess pest populations and damage severity, farmers can make informed decisions about pest control, ensuring both the protection of their crops and the sustainability of their farming practices. Effective pest management is not just about reducing the immediate threat posed by insects; it also involves maintaining a balance within the ecosystem by monitoring and preserving natural enemies, such as coccinellids and spiders, which contribute to biological control. This integrated approach not only helps in mitigating the impact of pests but also promotes a healthier and more resilient agricultural environment. Ultimately, the adoption of accurate pest monitoring and management practices is crucial for safeguarding groundnut yields, securing farmers' livelihoods, and supporting the broader agricultural economy. By prioritizing data-driven pest management strategies, the groundnut industry in India can continue to thrive, even in the face of growing environmental and economic challenges.