Management Strategies

a. Monitoring: Regular inspections for early detection.

b. Cultural Practices: Crop rotation, debris removal, clean cultivation, soil ploughing, and plastic mulching can reduce pest populations.

c. Chemical Control: Apply spinosad 45% SC @ 0.3 ml/L, ensuring careful use to avoid resistance and protect beneficial insects.

Leaf miner attack in leaves

Sweet potato leaf miner adult

Amorphophallus defoliator

Sphenoraia hopei a leaf beetle of the Chrysomelidae family, is found in Japan, China, Taiwan, and parts of Asia. These beetles are 5–10 mm long, typically yellowish to brown.

In recent years, they have been attacking Amorphophallus shoots in Kerala, feeding and boring into them. Severe infestations can dry out entire plants, threatening crop yields and troubling farmers.

Management Strategies

a. Cultural Control: Crop rotation, sanitation, and adjusted planting times.

b. Mechanical Control: Handpicking, yellow sticky traps, or pheromone traps.

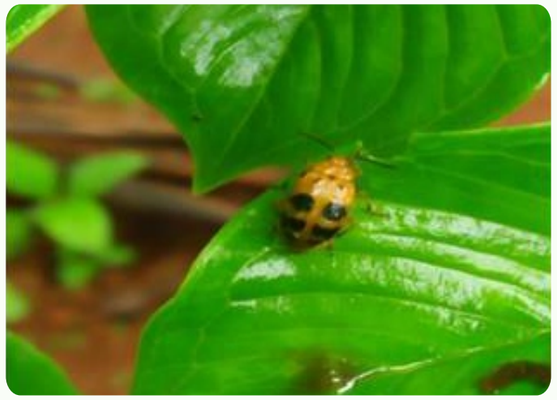
c. Biological Control: Promote natural predators (birds, spiders, wasps).

d. Entomopathogenic Nematodes: Soil application to target larvae.

e. Chemical Control: Use quinalphos 25% EC at 2 ml/L for spraying and drenching.

f. Monitoring: Regular checks and threshold-based interventions reduce excessive pesticide use.

Shoot attack by elephant foot yam defoliator



Chrysomelid beetle

Wireworm

Wireworms, the larvae of click beetles (Elateridae), are significant agricultural pests affecting crops like potatoes, corn, wheat, and yams. These slender, yellowish-brown larvae, up to 1.5 inches long, live in the soil for years, feeding on seeds, roots, and tubers. Their damage includes cylindrical holes and extensive tunnelling, leading to reduced yields, poor crop establishment, and unmarketable produce.

Adult click beetles, harmless to crops, emerge after pupation but continue the cycle by laying eggs. Wireworms bore into seeds, roots, and tubers, making plants susceptible to secondary infections.

Management Strategies:

a. Crop Rotation: Disrupts the pest's life cycle.

b. Soil Ploughing: Exposes larvae to predators and unfavourable conditions.

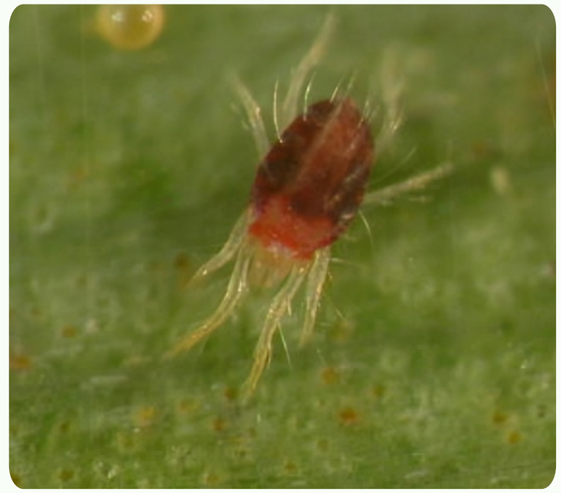
c. Biological Control: Encourages predators like birds and nematodes.

d. Chemical Control: Use fipronil 5% (1.5 ml/l) or chlorpyrifos 20% EC (2 ml/l), though with environmental caution.

e. Flooding: Soak fields for a week before planting to prevent infestations.

Attack by wireworms in amorphophallus

Kanzawa spider mite



Tetranychus kanzawai or the Kanzawa spider mite, is a pest that harms cassava in warm climates. It is small, red or reddish-brown, and around 0.4-0.5 mm long. These mites feed on plant sap, causing yellowing, bronze discoloration, and defoliation in cassava. Severe infestations lead to stunted growth and reduced tuber production.

Management Strategies

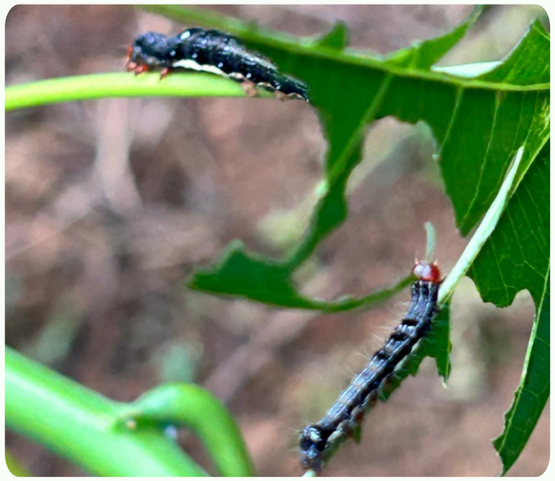
a. Cultural & Mechanical: Monitor for infestations, prune and burn affected branches, remove weeds, avoid planting from infested fields, and sanitize equipment. Spray with water and magnesium sulphate early on.

b. Biopesticides/Chemical: Use ICAR-CTCRI's biopesticide *Nanma* or neem oil with soap solution. Spray entomopathogenic fungi like *Hirsutella* or *Lecanicillium*.

c. Chemical: In severe cases, spray spiromesifen 22.9 SC.

d. Precautions: Monitor crops, sanitize materials, and avoid indiscriminate pesticide use to protect natural enemies. Follow a waiting period before releasing predators after acaricide use.

e. Community Approach: Farmers should collaborate for effective mite management.



Cassava hornworm larva

Cassava field infested with hornworm

Cassava hornworm

Tiracola plagiala, or the cassava hornworm, is a pest that damages cassava plants by feeding on their leaves, especially during its larval stage. The larvae are green or brown with a horn-like structure. Adults are medium-sized, grayish-brown moths active at night. Severe infestations can reduce photosynthesis and cause yield loss.

Management strategies

a. Biopesticides: Spray ICAR-CTCRI biopesticide *Nanma* @ 1.5% or neem oil @ 2%, or use *Bacillus thuringiensis* (Btk) @ 10 g/L or *Beauveria bassiana*/*Metarhizium anisopliae* @ 20 g/L.

b. Chemical Control: In severe cases, quinalphos 25% EC @ 2ml/L can be used. Early pest detection is key to managing hornworm infestations.

Conclusion

Surveillance and understanding of emerging pests in tropical tuber crops are crucial for effective management. By combining strategies like cultural modifications, biopesticides, natural enemies, and low-risk chemical pesticides as a last resort, pests can be controlled before causing major economic damage.

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Emerging pests of tropical tuber crops and their management strategies

By

E.R. Harish, T. Makeshkumar, H. Kesava Kumar, B.G. Sangeetha,L.S. Rajeswari

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(भारतीय कृषि अनुसंधान परिषद्)

श्रीकार्यम, तिरूवनन्तपुरम 695 017, केरल, भारत

ICAR-Central Tuber Crops Research Institute

(Indian Council of Agricultural Research)

Sreekariyam, Thiruvananthapuram 695 017, Kerala, India

Tel. No. : 91 (471)-2598551 to 2598554; E-mail: director.ctcri@icar.gov.in, Website: https://www.ctcri.org

Emerging pests of tropical tuber crops and their management strategies

Apart from the common and well-known tuber crop pests, recently several other pests are emerging as big concern for the cultivation of tropical tuber crops. Among them, sweet potato vine borer, sweet potato leaf miner, amorphophallus defoliator, wireworm, Kanzawa spider mite and cassava hornworm are most important.

Sweet potato vine borer

The vine borer (*Omphisa anastomosalis*) is an emerging pest that significantly reduces sweet potato yields in India. Larvae bore into the vine's collar region, creating tunnels that cause withering, wilting, and plant death.

- Adults are small brownish moths with fringed wings (20-30 mm wingspan).
- Larvae are creamy-white caterpillars with reddish-brown heads, growing up to 25 mm.
- Larvae disrupt the plant's vascular system, leading to wilting, stunted growth, and tuber damage.

Management Strategies

a. Vine Treatment: Dip vines in imidacloprid 0.001% for 10 minutes before planting.

b. Crop Rotation: Rotate with crops like rice, yam, or maize to minimize infestations.

Vine borer larva

c. Field Hygiene: Destroy crop residues post-harvest to kill overwintering pests.

d. Biological Control: Use entomopathogenic fungi (*Beauveria bassiana* or *Metarhizium anisopliae*, 20 g/L).

e. Insecticide Spray: Drench the collar and spray with thiamethoxam 25WG (1 g/L) or imidacloprid 17.8 SL (1 ml/L) fortnightly after one month of planting.

Vine borer adult

Sweet potato leaf miner

The sweet potato leaf miner (*Bedellia somnulentella*) is a small moth from the Bedelliidae family. Its larvae mine sweet potato leaves, causing serpentine damage that reduces photosynthesis and crop yield.

Adult moths have a wingspan of 6–7 mm, slender bodies, and fringed wings. Females lay tiny eggs on leaf undersides. Larvae, legless and translucent (turning green as they feed), attack between leaf surfaces, causing up to 30% damage. Pupation occurs in mined leaves within silken cocoons.

Larvae feeding leads to transparent leaves, desiccation, reduced photosynthesis, and sometimes defoliation, significantly impacting yield.