Red palm weevil *(Rhynchophorus ferrugineus):*

- Spot application of 0.02% imidacloprid 17.8 SL (@1.12 ml per litre of water).
- Installing traps helps to mass trap and destroy.
- At advanced stage of infestation, removal and burning of palms.

Red Palm Weevil

Eriophyid mite:

- Undertake crown cleaning.
- Root feeding azadirachtin 10,000 ppm @ 10 ml + 10 ml water.
- Spraying with neem oil-garlic-soap mixture @ 2 per cent concentration is effective.

Mite Infestation

Important Diseases & Their Management

Bud rot *(Phytophthora palmivora):*

- First signs are yellowing younger leaves, withering of the spindle, and decay with foul smell.
- Phytosanitation: Severely affected palms should be destroyed.
- Crown cleaning and prophylactic spraying of palms with 1% Bordeaux mixture.
- At the early stages of infection, after crown cleaning, treat the wound with Bordeaux paste (10%) or chlorothalonil solution (3 g in 300 ml water /palm).

Bud Rot

Root (wilt) disease *(Phytoplasma):*

- Causes flaccid, yellowed leaflets, reduced nut yield, and thin kernel.
- The disease is transmitted by lace bug Stephanitis typica.
- Use of tolerant varieties.

Stem bleeding *(Thielaviopsis paradoxa):*

- Shows as reddish-brown sap oozing from trunk cracks, leading to decay.
- Remove affected tissue, treat wounds with hexaconazole (0.2%), and cover with coal tar after 1–2 days.
- Root-feeding of 100 ml of 5% Calixin quarterly is also effective.
- Apply 5 kg neem cake with fertilizer and avoid injury to the trunk.

Basal Stem Rot disease / *Ganoderma* disease / Thanjavur wilt:

- Leaves droop in the outer whorl and heavy button shedding.
- Remove and destroy dead palms, isolate affected palms by trenching.
- Avoid flood irrigation in infected plantations.
- Root feeding of hexaconazole @ 2% (100 ml solution per palm).
- Apply neem cake, and maintain strict field hygiene.

General Management Tips for Goa

- Maintain garden hygiene year-round; remove and destroy pest-infested/diseased tissues promptly.
- Intercropping suppresses pest build-up if intercrops are well managed.
- Timely irrigation, balanced fertilization and manuring reduce disease susceptibility.
- Regular monitoring for pest and disease outbreaks is essential, particularly following monsoon arrival or extended dry spells.

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Coconut Cultivation in Goa

Improved Practices, Production Trends & Management Strategies

ICAR - Central Coastal Agricultural Research Institute
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Coconut Scenario in Goa

Coconut (*Cocos nucifera*) is an important plantation crop of Goa, essential for local livelihoods and the rural economy. Majorly local varieties such as Benaulim, Calangute and Nanora are cultivated in Goa. The production of coconut was 150.79 million nuts in Goa during 2024-25, from an area of 26,807 hectares, with a productivity level of 5,625 nuts/hectare. The share of Salcete taluka in the production of coconut was highest, with production of 38.84 million nuts (24% share), followed by Bardez and Sanguem (2022-23). In the last two years, the price of coconut ranged from Rs. 17 to Rs. 67/kg in Goa.

Coconut Package of Practices for Goa

Adopting best practices enhances yield, prolongs palm longevity, and ensures efficient resource utilization.

Suitable Varieties

- Tall: West Coast Tall (WCT)
- Hybrids: Kera Sankara (WCT x COD), Chandra Sankara (COD x WCT), suitable for higher yield and early bearing.
- Dwarf: Chowghat Orange Dwarf suitable for use as a tender nut.
- Select seed nuts from high-yielding, disease-resistant palms.

Site Selection and Preparation

- Prefer deep, well-drained red sandy loam, laterite, or alluvial soils; avoid heavy clays, rocky substrata, or waterlogged spots.
- It tolerates a wide range of pH: 5.0–8.0.
- Pit size: 1 x 1 x 1 m for loamy soil; 1.2 x 1.2 x 1.2 m for laterite; 0.75 x 0.75 x 0.75 m for sandy soil.
- Place two layers of coconut husk at the pit bottom for moisture retention.

Planting

- Best time: Start of monsoon (June–July).
- Spacing: 7.5m x 7.5m (tall); 6.5m x 6.5m (dwarf); for hybrids, 8.5m x 8.5m.
- In coastal Goa, contour planting or mounding is recommended on sloped or lowland areas.

Nutrition and Manuring

- Apply FYM/compost: 50 kg per palm per year.
- Fertilizer schedule (per palm/year in adult plantations):
  - Nitrogen (N): 500 g
  - Phosphorus (P_2O_5): 320 g
  - Potassium (K_2O): 1200 g
- Split application: Once in May–June, next in August–September.

Irrigation

- Drip irrigation is preferred; apply 30–32 litres/palm/day.
- Basin irrigation: 200 litres once in four days during non-rainy months.
- Mulching with coconut husk, coconut leaf, or coir pith is effective for moisture conservation.

Weed Management

- Manual or sickle weeding, especially post-monsoon or in September–October. Slashed weeds and coconut residues can be used as mulch. Maintain a 2 m weed-free zone around each palm.

Intercropping & Cropping Systems

- Utilize the wide interspaces by growing intercrops like pineapple, banana, turmeric, ginger, and fodder grasses, especially in palms below seven years. Multi-tier and mixed farming, featuring crops such as cocoa, pepper, and nutmeg, is feasible in older plantations, provided all crops are adequately fertilized. In Goa, banana and pineapple are particularly profitable intercrops.

Intercropping in coconut

Coconut+Pepper System

Pest and Disease Management

Coconut palms in Goa are prone to several pests and diseases, which can significantly reduce yield if not managed effectively. Recommended management practices are given below.

Major Pests & Their Management

Leaf-eating caterpillars *(Opisina arenosella):*

- Feed on the leaves, found especially during summer months.
- Phytosanitation and applying recommended fertilizers and manures.
- Encourage biological control by releasing specific parasitoids like *Goniosus nephantidis* and *Elasmus nephantidis*.

Rhinoceros beetle *(Oryctes rhinoceros):*

- Bore into the crown, damaging fronds and producing V-shaped cuts.
- Mechanical removal using beetle hooks is effective.
- Fill innermost three leaf axils with 12 g of naphthalene balls and cover with sand at 45 days intervals or
- Place 03 perforated sachets containing chlorantraniliprole a.i. 0.4% (5g) or fipronil (3g).

Rhinoceros beetle damage

Root grubs (white grubs):

- Larvae feed on roots, causing palm yellowing & nut fall.
- Deep ploughing & hand picking of beetles is recommended.