Cashew Farming and Quality Improvement

Dr. Olawale M. Aliyu
Cocoa Research Institute of Nigeria (CRIN)
P M B 5244, Ibadan.

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What we do at CRIN

- Research and development
  Cocoa, cashew, kola, coffee and tea
- Highly skilled manpower in:
  Agric. Economics, Agric. Extension, Agronomy, Breeding, Crop processing & utilization, Entomology, Pathology, & Soil and Plant Nutrition.
- Working on cashew since 1973
- Intervention led to yield increase from 0.16 ton/ha in 1970s’ to 0.70 ton/ha in 1990s.
- Development of many cashew products
Cashew in Nigeria

- Afforestation tree plant
- Commodity crop – valuable crop for foreign exchange earnings.
- Main source of cash income in cashew growing areas
- Small holder crop mainly intercropped
- Average farm size 0.5-4ha
- Total area under cashew cultivation 330,000ha
- Current production 100,000tons
- Average yield 0.33 ton/ha? 0.73ton/ha
Causes of low productivity

- Unimproved planting materials
- Over crowding and interlocking
- Poor maintenance/abandoned
- Pest and diseases infestations
- Low plant population
- Low soil fertility
Cashew Farming

- **Soil Requirements**
  - Depth – 100 to 150cm
  - Not too clayish not too sandy
  - Balance nutrients

*Is true that cashew can grow in all soils????*
Cashew farming contd…

- **Planting materials**
  - Seeds/Seedlings –
    - easy, cheaper, readily available
      - Heterogeneity, high infestation, longer gestation

  Clones- grafting, budding, cutting & layering
  - True to type, uniformity, precocity, moderate plants.
    - Labour intensive, technical know-how, limited number, fragile with high mortality
Improved high yielding varieties from CRIN 3 – 8g/nut, 12-15kg/tree
High yielding Brazilian introduction, 11-13g/nut, 5-9kg/tree
Cashew Farming

- **Land Preparation**
  - Bush clearing – dry season, do not bulldoze.
  - Uproot unwanted trees especially 2º hosts.
  - Burning of whole plot should be avoided
  - Plough and harrow with first rain
  - Dig hole for the planting 45x45x45cm

- **Planting/Transplant**
  - Transplant/plant after heavy rains
  - Fill the soil with top soil and organic matters after planting
  - In case of in situ, sow nuts (2/point) with stalk end facing upwards
Cashew Farming contd…

- Seedlings (Not ideal)
- From quality trees,
- current season harvest,
- Must disease and infestation free
- Must be clean from apple remnants
- Must be moderate in size (6-13g)
Cashew Farming contd….

- **Field planting**

**Planting Geometry**

**Triangular**
- Increase plant population/unit area
- Delay interlocking of canopies
- Ideal for tall upright trees

**Rectangular**
- Reduced plant population/unit area
- Longer years of intercropping

**Plant Spacing**

*Dwarf varieties/savannah*
- **4.5 x 4.5m** = 494 trees
- **6.0 x 6.0m** = 278 trees
- **7.5 x 7.5m** = 178 trees
- **9.0 x 9.0m** = 123 trees

*Common-Open pollinated large trees*
- **7.5 x 7.5m** = 178 trees
- **9.0 x 9.0m** = 123 trees
- **10.0 x 10.0m** = 100 trees
- **12.0 x 12.0m** = 69 trees
- **15.0 x 15.0m** = 44 trees
**Cashew Farming contd…..**

- **Intercropping**
  - First 4 years of establishment in spaced population
  - Suppress weeds infestation
  - Generate early income
  - Select leguminous and not storey crop
  - Not crop hosting pest or disease of cashew e.g. *Helopeltis spp.* in cotton.

- **Weeding.**
  - Frequency varies with ecologies and cropping System (3-5 times)
  - Manual, chemical, mechanical.

- **Mulching**
  - Necessary at first dry season after establishment or late transplant
Intercropping with maize

Intercropping with yam
Cashew Farming contd…..

- **Pruning**
  - Important at formative stage (2-3 years) for single stem trees
  - Light pruning (annually after harvesting)
  - Sanitation/mature tree pruning (annually)
  - Spraying of 1% Bordeaux mixture or painting of the cut surface necessary for large branches
Major Diseases of cashew

- Die-back of shoot/twig, floral and fruits caused by *Lasiodiplodia theobromae*
  control: insecticide & fungicide (1:1) & resistant variety

- Anthracnose of shoot
  cause: *Colletotricum gleosporioides*
  control: fungicide spraying & resistant variety

- Root rot
Anthracnose Twig die-back
Major Pests of cashew

- Stem girdler, *Analeptis trifasciata*
  control: cultural & sanitation

- Root and stem borer, *Plocaederus ferrugineus*
  control: cultural & sanitation.
  prophylactic: Swabbing the trunks (1m a.g.l) with coal tar & kerosine (1:2)

- Red-banded thrips: *Selenothrips rubrocinctus*
  control: spraying with rogor (0.05%)

- Leaf roller, *Euprotis fasciata*
  control: spraying with Endosulfan (0.05%)
Major insect Pest of Cashew in Nigeria

Stem girdler, *Analeptis trifasciata*

Stem borer, *Plocaederus ferrugineus*
Cashew Farming

- Fire protection (tracing) is a very important operation in management of cashew plantations!!!!!
- Tracing of 15 – 20m wide recommended
Cashew Farming contd…

- Rehabilitation and farm upgrading
  
  Reasons:
  - Declining yield over time – overcrowding, interlocking of canopies, nutrient deficiency
  - Presence of high proportions of low/non-yielding trees

- Strategies for rehabilitation and upgrading
  - Selective thinning of lowest yielding trees
  - Replanting of gaps with improved planting materials
  - Replacement
  - Top-working
  - Stumping (1m a.g.l)
  - Heading-back
  - Increase soil fertility
  - Control pest and diseases
Recommended cultural control measures

- Intercropping of young cashew with broad-leaved cocoyam, maize and cassava in the first year as a means of indirectly controlling weed.

- Filling gaps created by dead stands, by replacing dead trees with vigorous seedlings.

- Avoid shade crops or neighbouring trees that are alternate hosts to pests and pathogens.

- Pruning of overgrown stems and branches together with continuous removal of overgrown weeds reduces incidence of pests and diseases is greatly reduced in cashew plantations.
Recommended cultural control measures contd…

- Regular removal of dead, diseased and insect damaged stems, which should be destroyed to prevent further pathogen and insect development.

- Hand picking and crushing of adult stem girdlers and other insects found on the branches.

- Preservation of known predators of mirids such as *Oecophylla* spp. and spiders by avoiding spraying their nests/tents even during routine spraying operations.

- Clearing of a wide strip (fire tracing) round the plot to prevent fire from entering the farm from nearby bush.
Quality Improvement

Quality to farmers
- good productivity per unit area of land
- continued stable production over the years
- low input requirement and reduced labour costs for field maintenance and nut collection

Quality to processors
- need dry and sane nuts
- Kernel content (of raw nuts) of about 26%
- have a regular shape and more or less the same size
- nuts should not be smaller than 5.6 g
- count per kg should be less than 176 nuts/kg
Quality Improvement

- **Advantages:**
  - Collection of nuts is less cumbersome or faster for farmers
  - Shelling is faster for processors
  - High kernel output increases profitability of processing
  - Bigger kernels fetch a better price and image for trader
Quality Improvement

- **At planting.**
  - Combination of high yielding (>10kg/tree) & mean nut weight (6-13g)
  - Nut loosely attached to apples
  - Good shell peeliability
  - High kernel to nut ratio (>25%)
  - Early to mid-season fruiting (Jan-April) with moderate period of harvest (<45 days)

- **After Planting.**
  - Plantations must weed free
  - Trees must be healthy
  - Fruits must be fully matured, allowed to drop before harvest.
Quality improvement

- **At & Post Harvesting:**
  - Detached nuts from apples immediately after picking.
  - Heap harvest, collection in bags or baskets for longer period should be avoided.
  - Dry nuts for 2-3 days on concrete slabs, until make rattling sound (8-9% moisture)
  - Clean all apple remnants
  - Removed foreign matter
  - Grade into standardized categories
  - Pack into jute bag @80kg
  - Stack on the pallets in a well ventilated leak-proof,
Quality improvement
THANK YOU