

Cashew Farming and Quality Improvement



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Nigerian Cashew Week 2-5 March 2010

What we do at CRIN

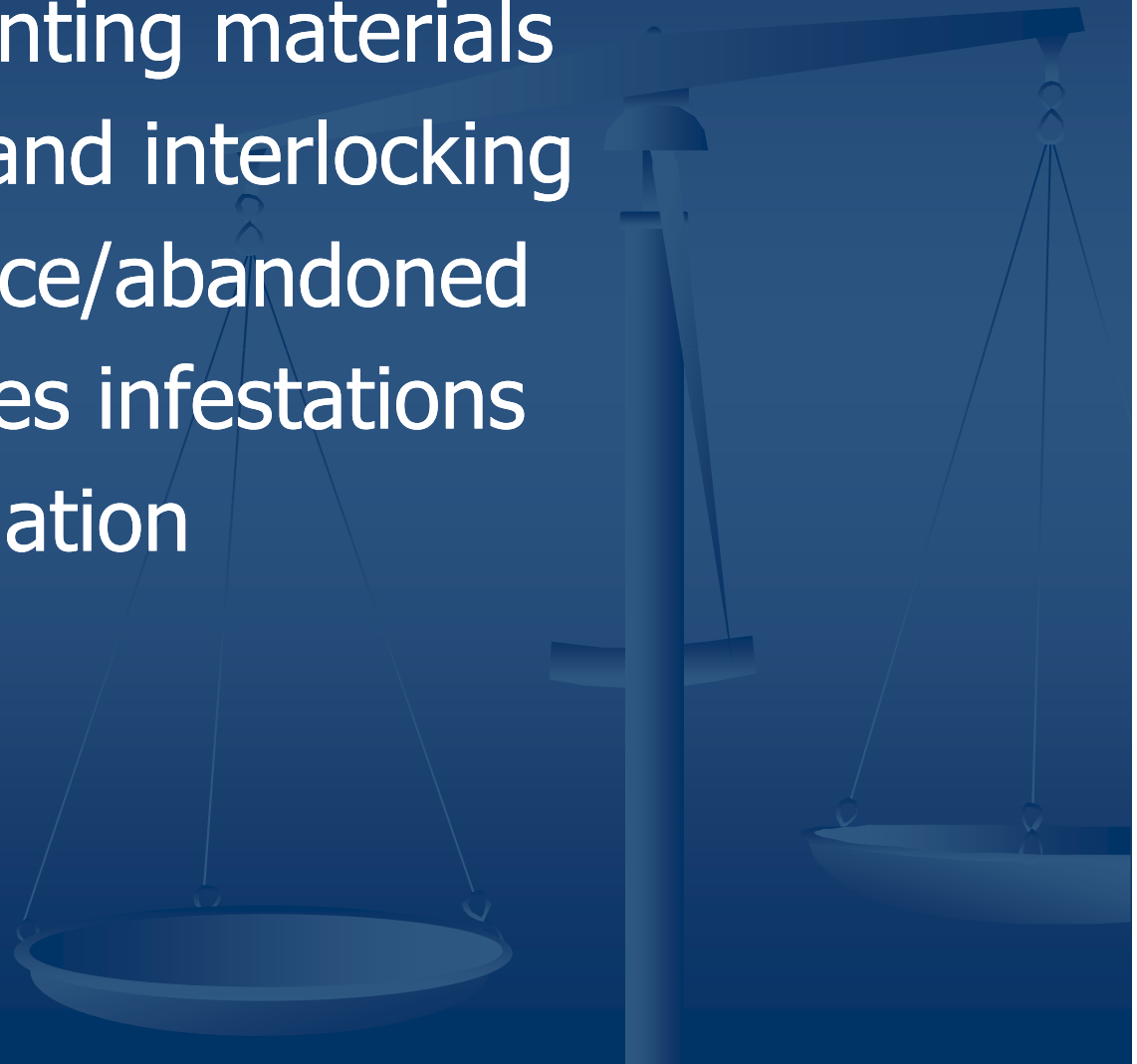
- Research and development
Cocoa, cashew, kola, coffee and tea
- Highly skilled manpower in:
Agric. Economics, Agric. Extension, Agronomy, Breeding, Crop processing & utilization, Entomology, Pathology, & Soil and Plant Nutrition.
- Working on cashew since 1973
- Intervention led to yield increase from 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 2^o 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 a leguminous

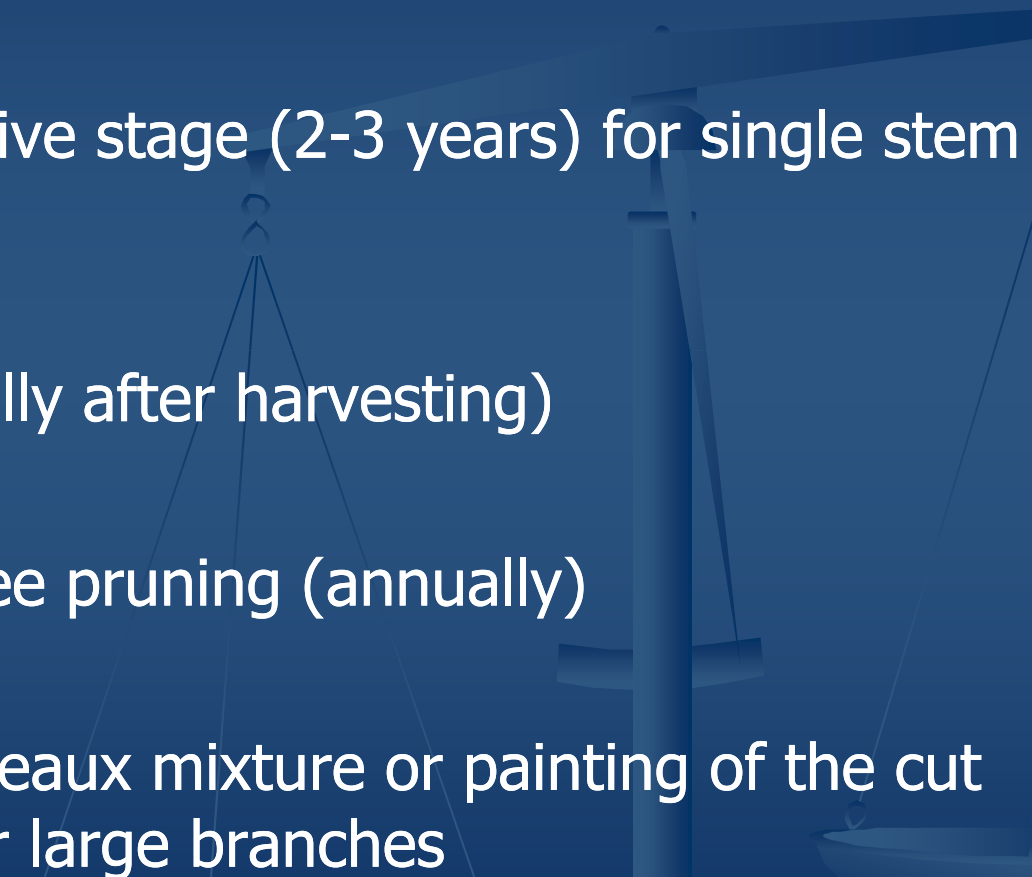


Intercropping with maize

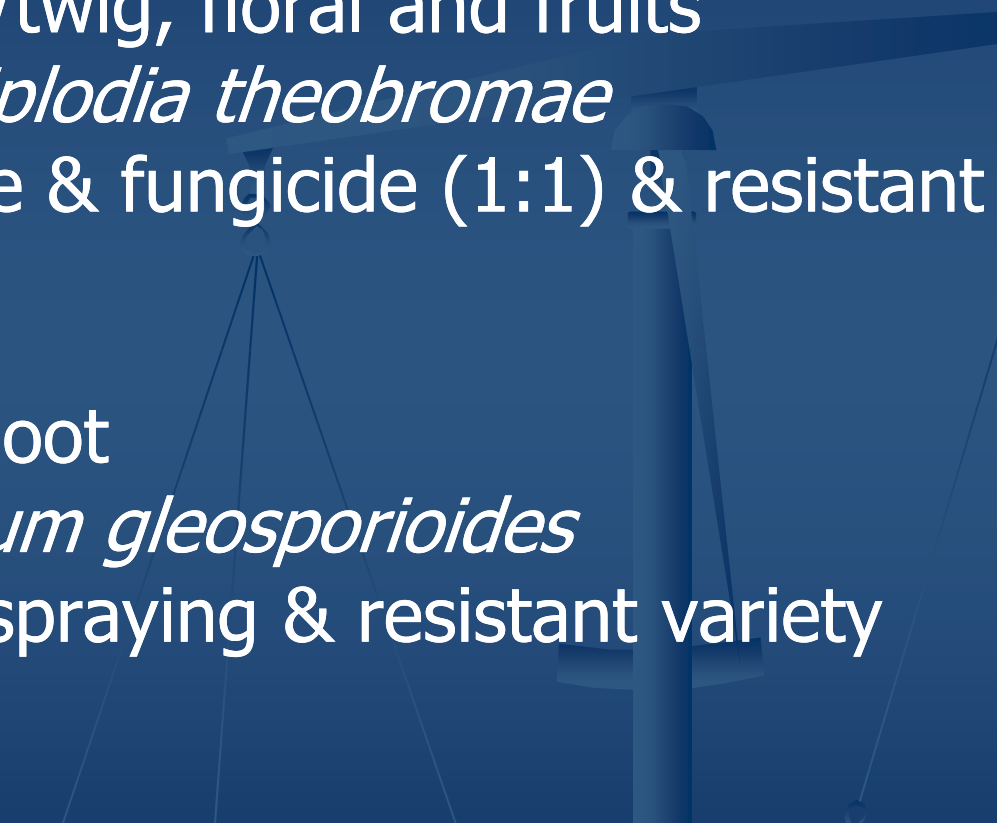


Intercropping with yam

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
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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
- 



Twig die-back



Anthracnose

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

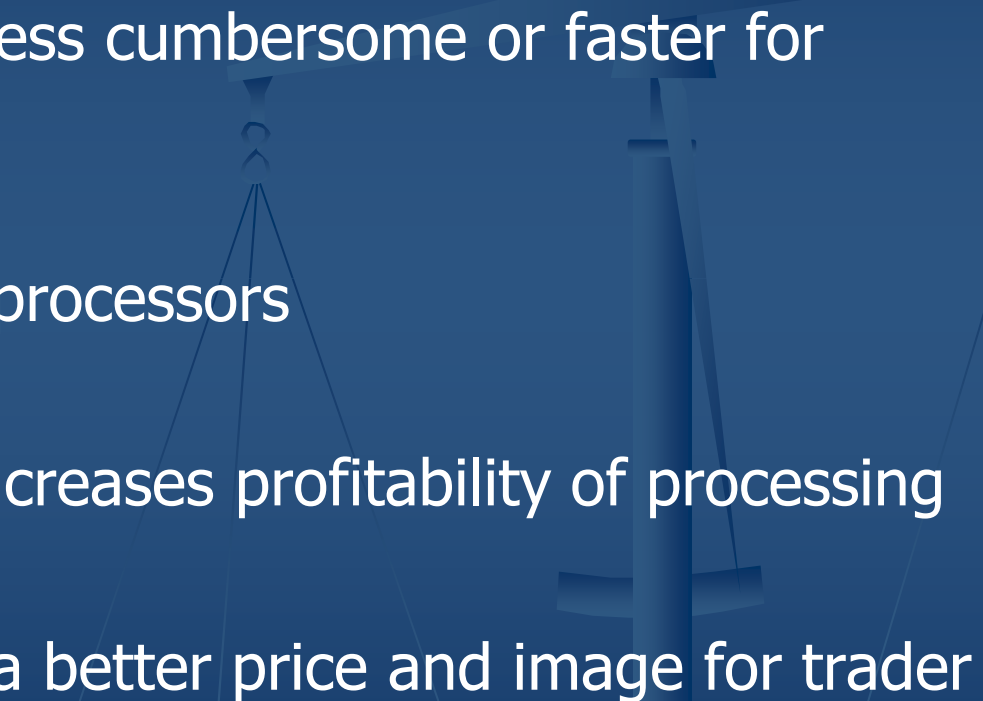
- good productivity per unit area of land
- continued stable production over the years
- low input requirement and reduced labour costs for field maintenance and nut collection

■ 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
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Quality Improvement

■ At planting.

- ✓ Combination of high yielding ($>10\text{kg/tree}$) & 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)

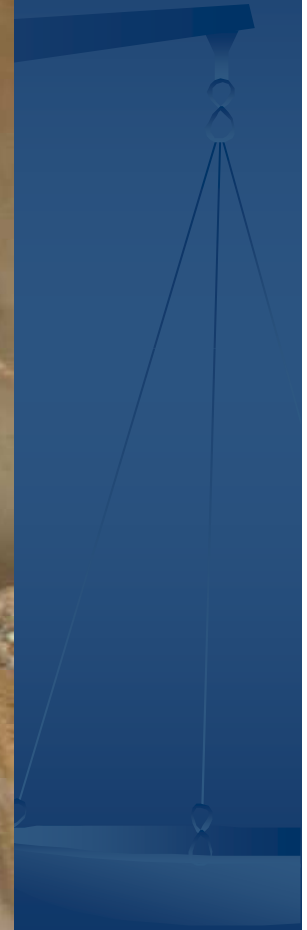
■ After Planting.

- ✓ 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

