14th ACA Annual Cashew Conference

ACA
AFRICAN CASHEW ALLIANCE

BUILDING A VIABLE CASHEW VALUE CHAIN TO WITHSTAND MARKET DISRUPTIONS

Fully Online

zoom

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Research Efforts To Obtain Marketable Raw Nuts And Kernels: Perspectives From Current Research

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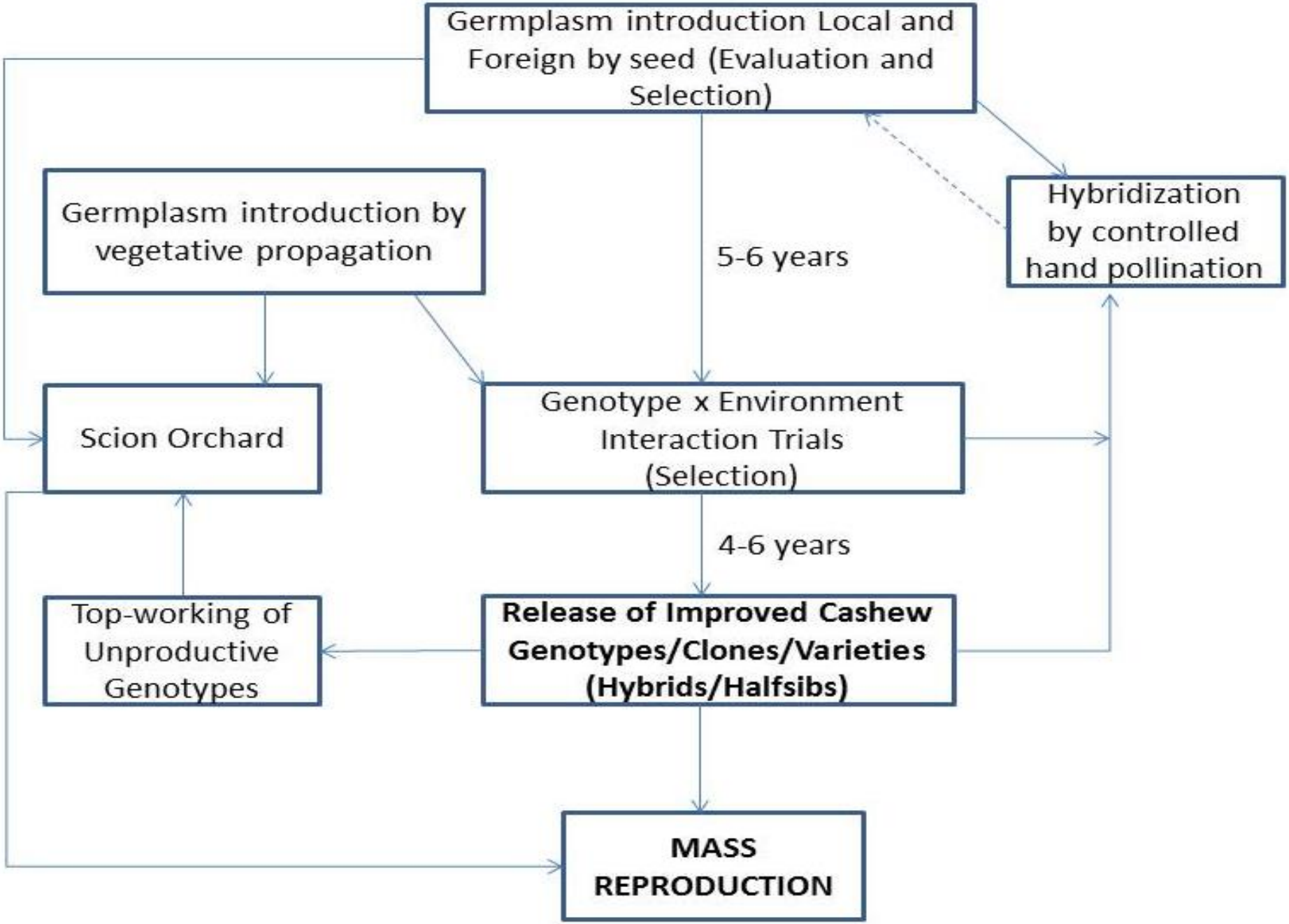
Introduction

- Cashew Is A Tree Of Great Economic Importance
- It Is Suitable To Combat Global Warming
- Produce Apples And Nuts Which Have Several Commercial & Industrial Uses
- Cashew Research Was Previously Not Given Due Attention In Africa Until 1990s
- Many Countries Are Now Strengthening Cashew Research Programmes In Africa

CASHEW RESEARCH

- Research On Cashew Takes Many Years To Develop Varieties / Hybrids With Good Processing Quality
- Minimum 5-6 Years For Mass Selection Or 2-3 Years To Identify Elite Mother Trees
- Additional 4-6 Years To Conduct Genotype x Environment Interaction Trials At Different Agro-ecological Sites


Germplasm introduction Local and Foreign by seed (Evaluation and Selection)
Germplasm introduction by vegetative propagation
5-6 years
Hybridization by controlled hand pollination
Scion Orchard
Genotype x Environment Interaction Trials (Selection)
4-6 years
Top-working of Unproductive Genotypes
Release of Improved Cashew Genotypes/Clones/Varieties (Hybrids/Halfsibs)
MASS REPRODUCTION

Cashew Research Cont…

- Most Important Traits Are Yield, Nut Quality, Disease & Insect-pest Resistance
- Yield In Cashew Depends On Genotypes, Soil Types, Age, Canopy Management And Size Of The Tree

Age (Yrs)	YIELD PER TREE (Kg)				
	<10	10-15	20-30	>30	>40
<10	Good	Best	Elite	Elite*	Elite***
10-15	Bad	Good	Best	Elite	Elite*
>15	Bad	Bad	Good	Best	Elite

Cashew Research Cont…

- Nut Quality Parameters Include:-
  - Nut Count <200 Per Kg: To Reduce Processing Costs And Higher Kernel Prices
  - Nut Shape Bold: To Fit In Current Automated Processing Technologies
  - Easy De-shelling, Easy Peeling of Testa
- Disease And Insect-pest Resistance

RESEARCH ACHIEVEMENTS

- Selection Of Mother Trees Took Place In Some Countries Where Selection Criteria Were Established And Adopted (Tanzania, Mozambique, Ghana, Benin, Ivory Coast & others)
- The Mother Trees Were Used To Establish Clonal Orchards As Source Of Scion For Multiplication Of The Planting Materials (Tanzania, Mozambique, Ghana, Benin, Ivory Coast & others)

Achievements……

- Grafting is Currently the Only Main Method Used For Cashew Multiplication But it Is So Inefficient that It Cannot Meet The Existing Demand of Planting Materials in any Country in Africa

Research Achievements Cont…….

- Development Of Cashew Commercial Varieties Through Genetic Trials Took Place Only In Tanzania
- Improved Planting Materials are Available in Some Countries (Mozambique, Ghana, Ivory Coast, Benin, Burkina Faso and Zambia)
- Design And Establishment Of Polyclonal Seed Orchard Remains To Be The Main Source Of Planting Materials In Tanzania and Mozambique And Will Be The Same In All Countries In Future

Achievements Cont……

- Mother Trees/Cashew Varieties Are Now Used In Some Countries To Establish Orchards For Clonal/Polyclonal Seed Production
  - Clonal Seeds
    - A small Number Of Trees Will Not Perform well.
  - Polyclonal Seeds
    - Most Cashew Trees Will Perform Well And Even Better Than The Parental Trees. These Are Currently The Main Source Of Planting Materials

WHAT IS POLYCLONAL SEEDS?

- Seeds Harvested From Polyclonal Seed Orchards Or Gardens (PSO Or PSG)
- PSO Is Established Using Registered Cashew Varieties Or Selected Elite Cashew Mother Trees Which Have Outstanding Yield Potential And Acceptable Nut Qualities
- Orchards Are Planted In A Special Design Called Systemic Or Next Neighbor Design In An Isolated Farm/Special Farms

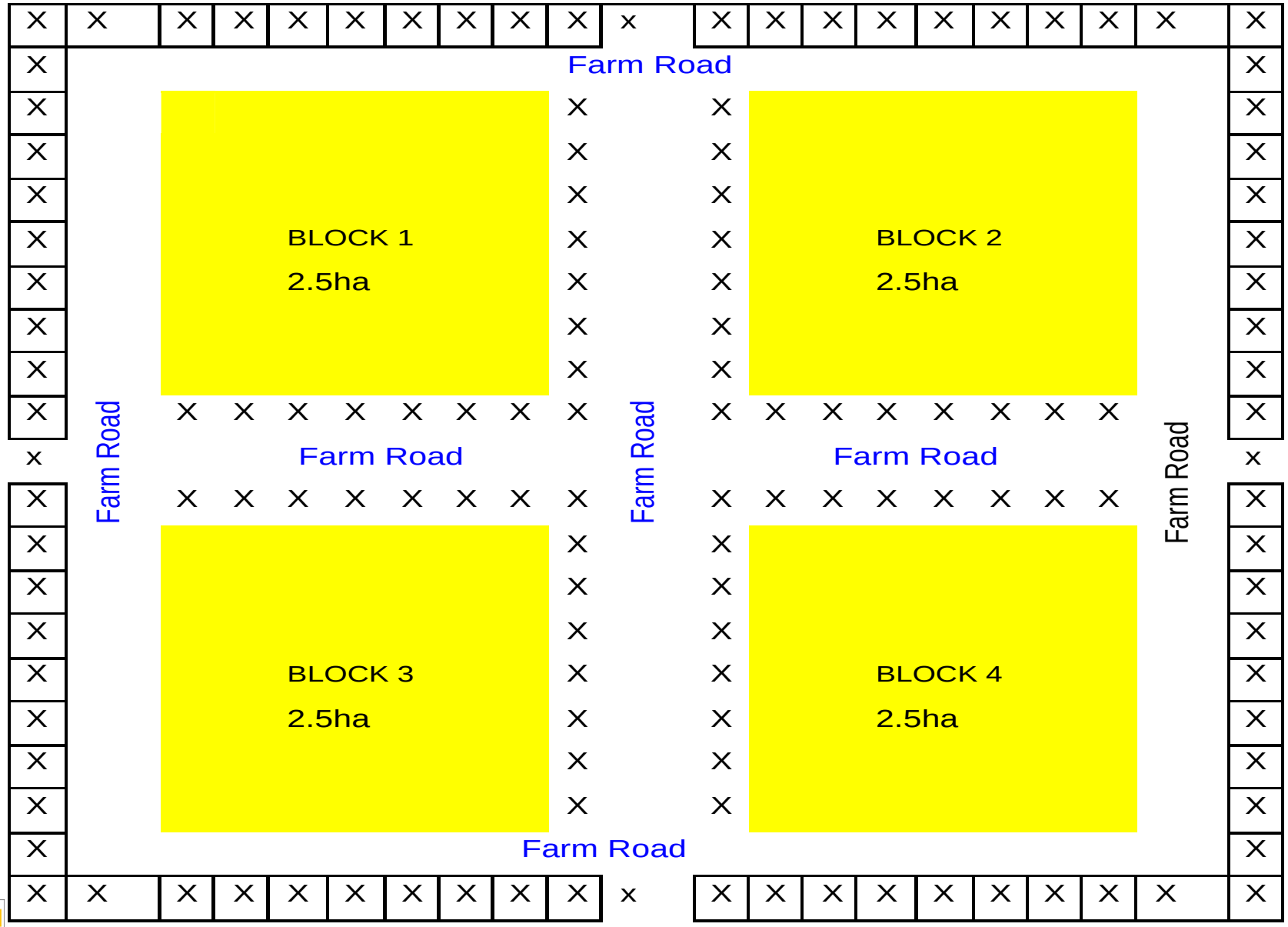
Layout of Polyclonal Seed Orchard

Field layout of one block of polyclonal seed orchard comprising of 10 varieties

	1		2		3		4		5		6		7		8		9		10	
		5		6		7		8		9		10		1		2		3		4
	8		9		10		1		2		3		4		5		6		7	
		1		2		3		4		5		6		7		8		9		10
	4		5		6		7		8		9		10		1		2		3	
		8		9		10		1		2		3		4		5		6		7
	1		2		3		4		5		6		7		8		9		10	
		5		6		7		8		9		10		1		2		3		4
	8		9		10		1		2		3		4		5		6		7	
		1		2		3		4		5		6		7		8		9		10

Varieties are represented by numbers 1 to 10

Design 1. Field plan for blocks of polyclonal seed orchard



Where To Get Polyclonal Seeds?

- There Are Only Two Countries In Africa Which Produce True Polyclonal Seeds
  - Tanzania (12 Polyclonal Seed Orchards)
  - Mozambique (7 PSOs)
    - Public 3 (Nhassoro, Nhaoongo & Nassuruma)
    - Private 4(Meconta, Monapo, Nametil & Cuamba
  - Benin through Technoserve is preparing to establish PSO and will probably be the first country in West Africa

Can Cashew Trees Raised From Polyclonal Seeds Be Used To produce Cashew Seed for Planting!

- Nuts Harvested From These Trees Are Not Polyclonal Seeds!
- Such Trees Have Not Shown & Scientifically Confirmed To Perform Very Well
- They Are Not Improved Planting Materials at Moment
- They Are Just Normal Seeds

MAIN CHALLENGES IN NUT QUALITY

- Outbreak of Diseases
- Outbreak of Insect-Pests
- Post Harvest Handling

Out-break Of Diseases

Powdery Mildew

Outbreak of diseases…..

Leaf And Nut Blight

Out-break of Insect Pests

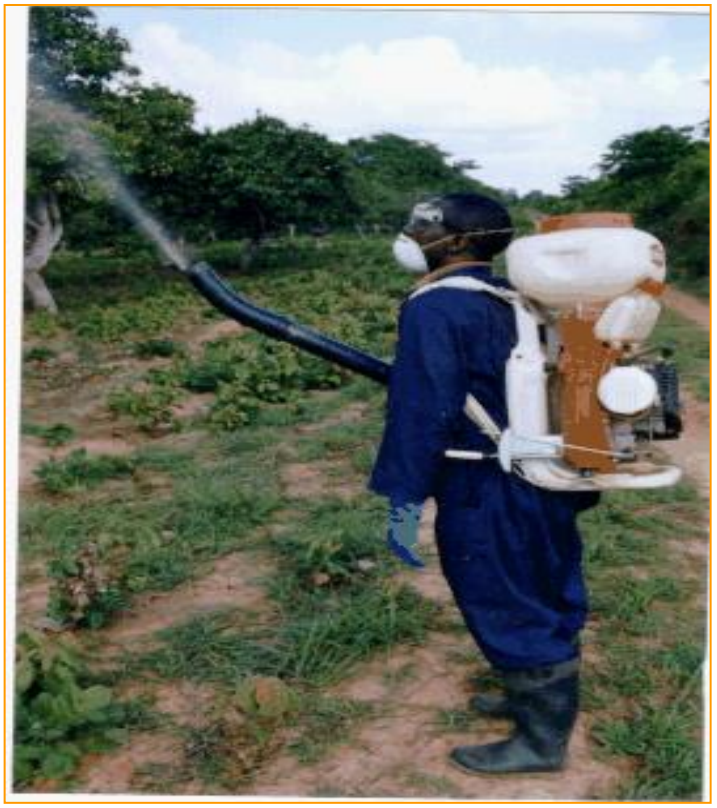
Coconut /Aeroplane Bugs

DISEASE & PEST CONTROL STRATEGIES ARE IN PLACE

- Sulphur (Dust Or Water Based) Have Been Recommended To Control Powdery Mildew Disease (PMD)
- Water Based Organic Fungicides To Control PMD Include
  - Triadimenol
  - Hexaconazole
  - Penconazole etc.

Disease control…….

- Water Based Fungicides To Control Blight Include
  - Trifloxistrobin
  - Picoxystrobin
  - Azoxystrobin
  - Chlorothalinil etc.
- Insecticide: Pyrethrin Products
- Motorized Mist Blowers Are Used To Apply Pesticides



Conclusion

- Some Countries Have Developed Improved Planting Materials Of Higher Nut Qualities
  - Varieties, Hybrids, Elite Mother Trees
  - High Quality In Terms Of Shelling % And KOR
  - Suitable For Current Processing Technology
  - Its Multiplications Remains To Be A Challenge
- Disease Control Strategies Have Improved Nut Qualities In East Africa
- Some Cashew Research Institutes Have Poor Infrastructure, Inadequate Financial And Human Resources & This Needs Special Attention