



RESEARCH
PROGRAM ON
Forests, Trees and
Agroforestry

Contribution de la domestication des arbres fruitiers locaux à la sécurité alimentaire et nutritionnelle en Afrique centrale



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What is Tree Domestication?

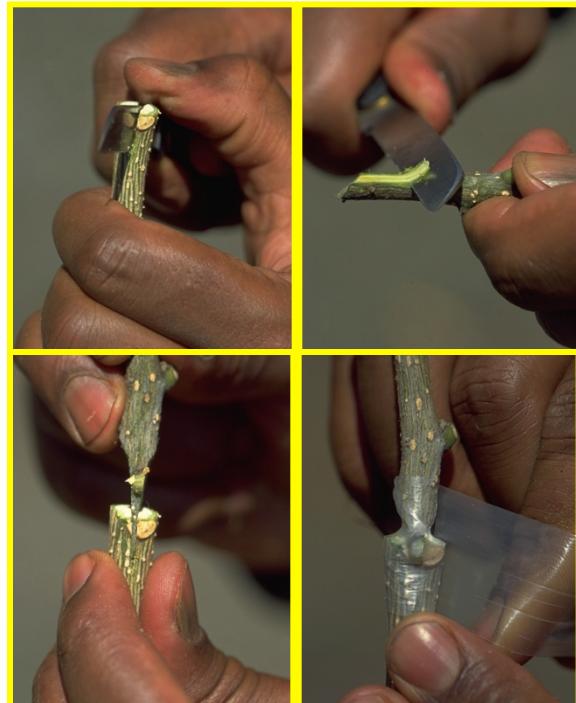
- the means communities **select, propagate and manage** high-value indigenous fruit trees and medicinal plants and integrate them in the various farming systems,
- Species with no market information systems
- species which are mainly selected encompassing **indigenous knowledge and genetic selection based on scientific principles**
- a strong partnership with scientists, civic authorities and private companies.
- PTD is a farmer driven and market lead process. It focuses on species **farmers consume best** with high potentials for local, regional and international markets



How to multiply the selected species: rooting cuttings

GRAFTING TECHNIQUES

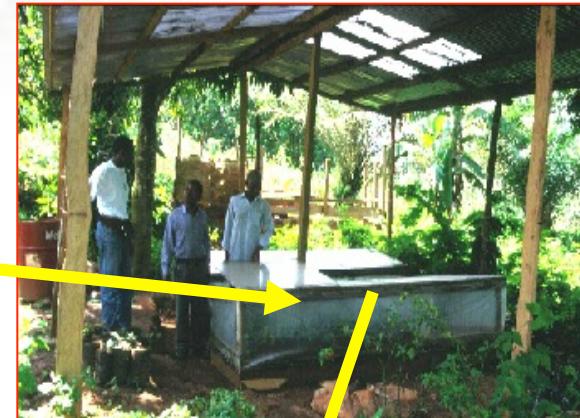
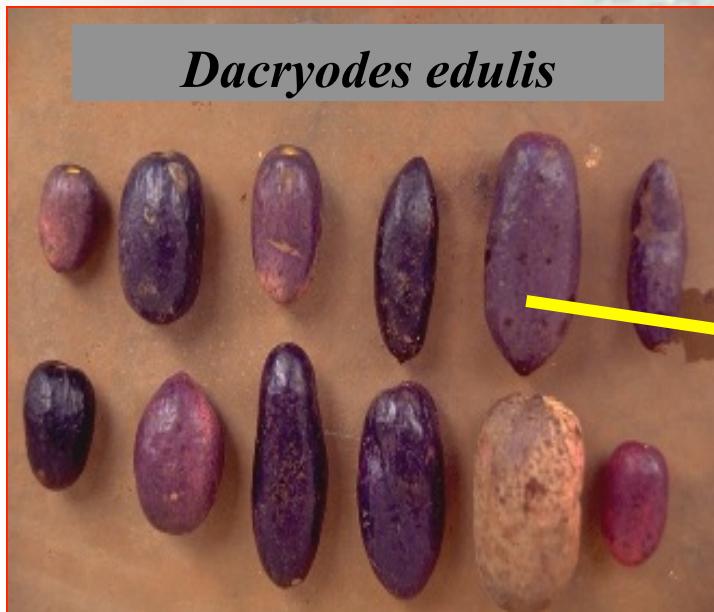
- No new secrets but skills normally reside with station or research staff
 - Farmers, extension services need the techniques



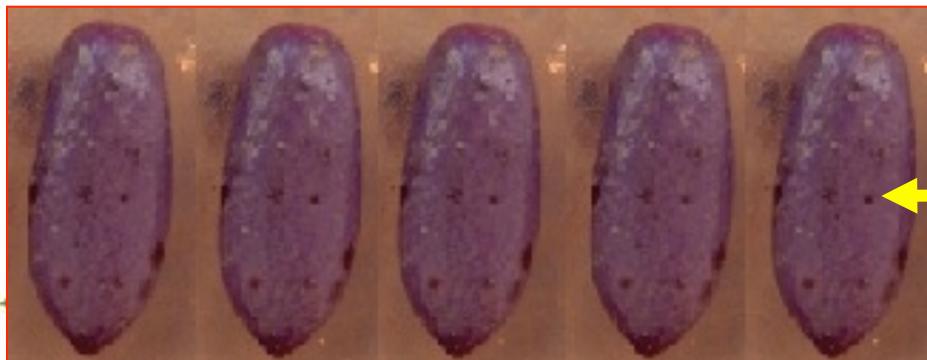


How to multiply the selected species: air layering

Creation of a cultivar



Earlier fruiting, smaller trees and uniform quality



KEY SPECIES UNDER DOMESTICATION



SPECIES UNDER DOMESTICATION

Kola nitida



Ricinodendron heudelotii



Irvingia gabonensis

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Gnetum





Afrotyrax lepidophyllus



 *Garcinia cola (Bitter kola)*



Monodora myristica



Zanthoxylum macrophylla



P. Johimbe cutting



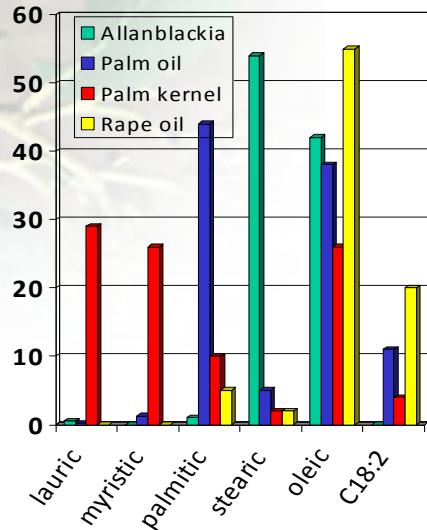
Prunus. africana



Enantia Chlorantha

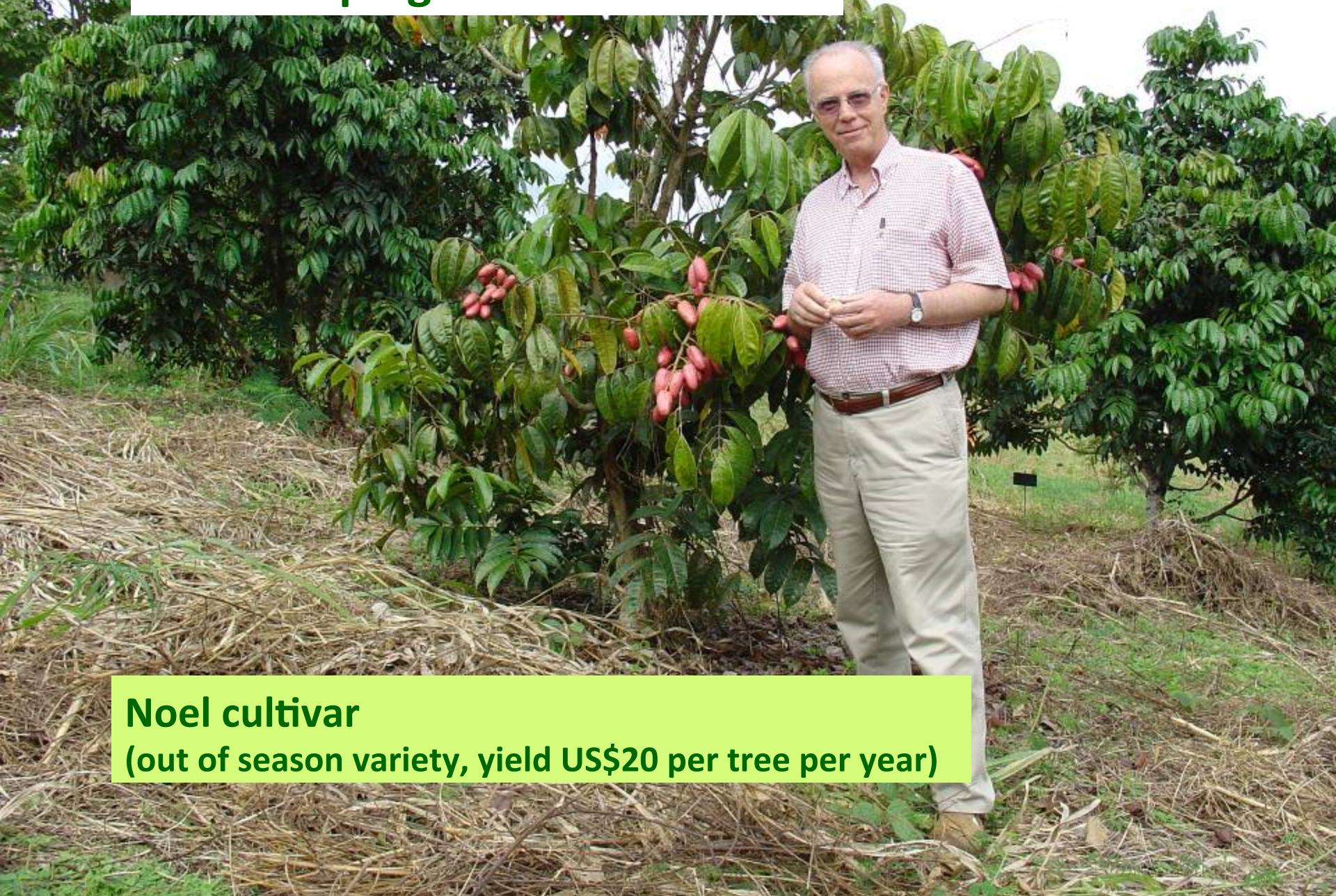


E. chlorantha for hepatitis A, B, D, E





... developing elite varieties



**Noel cultivar
(out of season variety, yield US\$20 per tree per year)**

A young Allanblakia fruiting six years after planting





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Baobab vegetable bank





Nutritional benefits of indigenous fruits

Species	<i>Dacroydes edulis</i> fruit (88% dm)	<i>Irvingia gabonensis</i> kernels (88% dm)	Maize grain (86% dm)	Rice grain	Cassava tuber (30-35%dm)
Carbohydrates	14	26-39	66-76	46-59	24-31
Fats/oils	32	51-72	2-6	1-2	<1
Protein	26	7.4	5-14	4-8	1
Fibre	18	1	1-3	1-4	1-2



Data on micronutrients, fatty acids, etc.
in Leakey 1999, *Food Chemistry* 64, 1-14.



Nutritional value safou

Mineral composition of *D. edulis* (ppm)

	Mean % Pulp& Seed\$	
Mg	280.15 - 287.65	4.85
Fe	3.43 - 358	6.2
Zn	3.65 - 3.81	0.55
Cu	0.38 - 0.45	4.85
Ca	347.50 - 354.62	0.74
Na	692.55 - 698.40	1.36
K	540.81 - 549.23	85.15
P	692.55 - 698.40	-

Proximate composition of *D. edulis*

	Mean %	
	Pulp	Seed
Moisture	18.6	20.6
Ash	3	2.6
Protein	1.93	1.4
Fat	11.94	10.44
Fibre	47.5	48.5
Carbohydrate	17.03	16.46

Source: Ajayi and Oderinde, 2002

Source: &Omogbai and Ojeaburu 2010;

\$Ajayi and Adesanwo, 2009

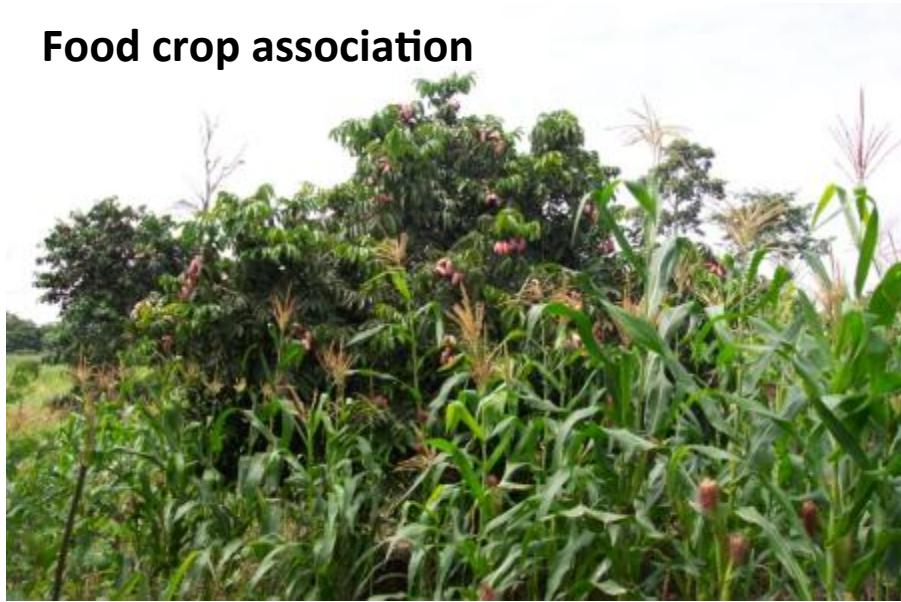


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Farm management: *D. edulis*

Food crop association



Home garden



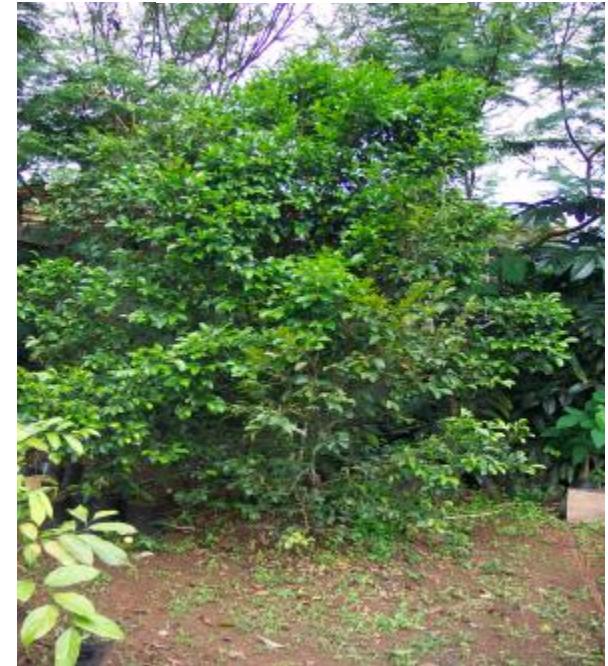
- Suitable to grow in Coffee, Cocoa plantations as shade crop, on farm boundaries and within crops
- No significant negative interactions noted in a trial on establishment methods
- Establish under partial shade initially at 100 trees/ha density

Farm management: *Irvingia* spp

Food crop association



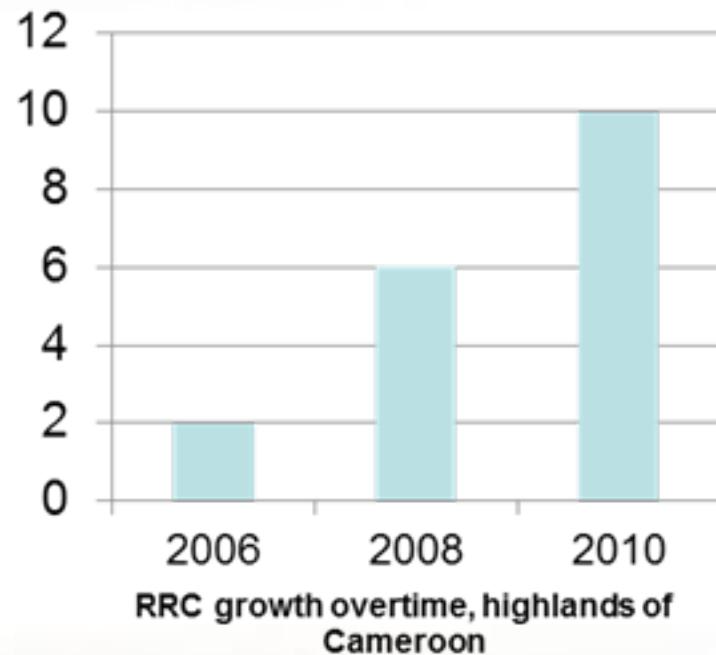
Home garden



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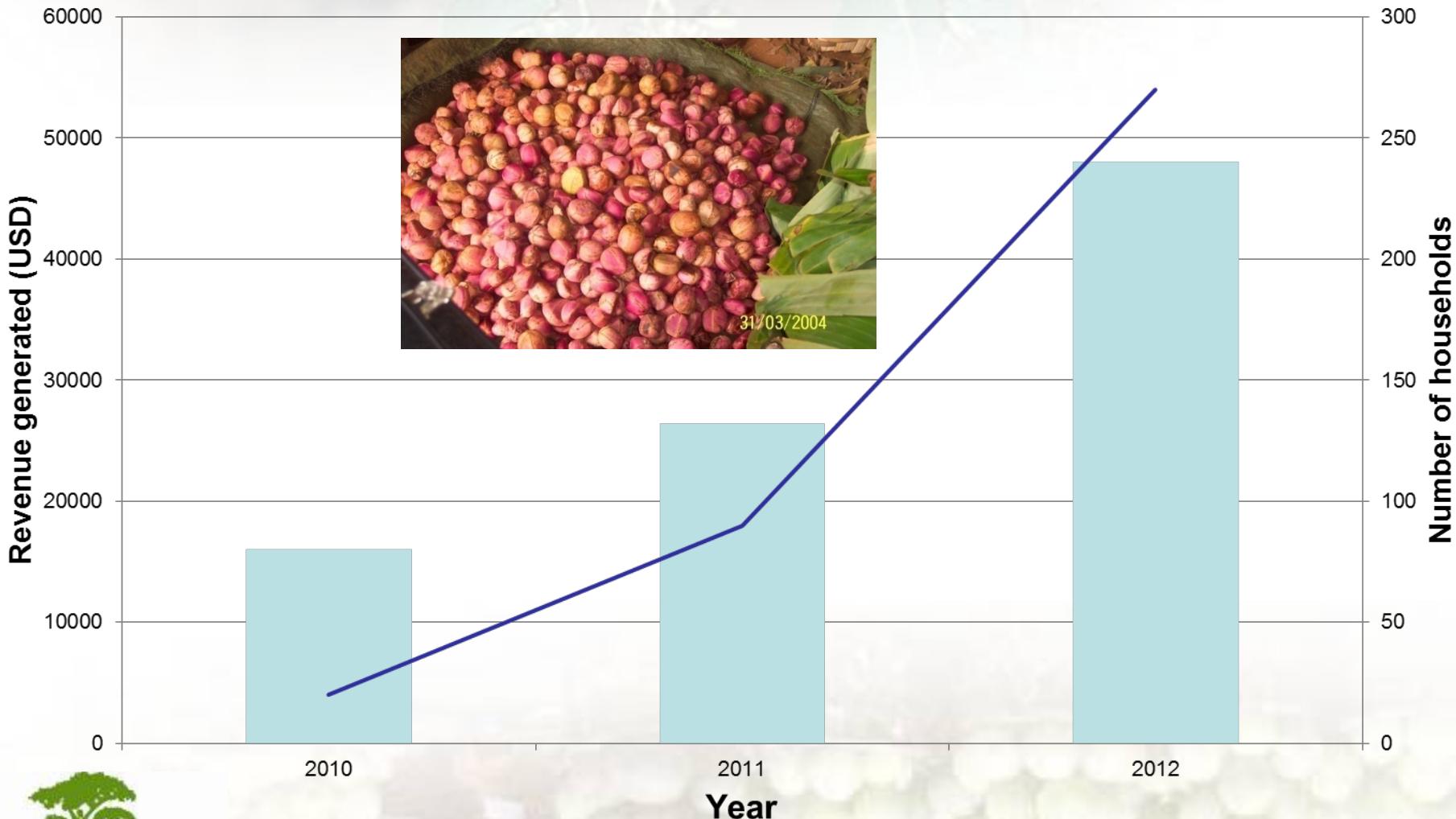
KEY SERVICES OF RRCs

- Strengthening farmers skills in nursery techniques, group dynamic and marketing.
- Demonstration and information on the agroforestry techniques
- Access to information on marketing
- Link the different actors of NTFPs with the private sectors
- Forum of exchange for different actors of NTFPs

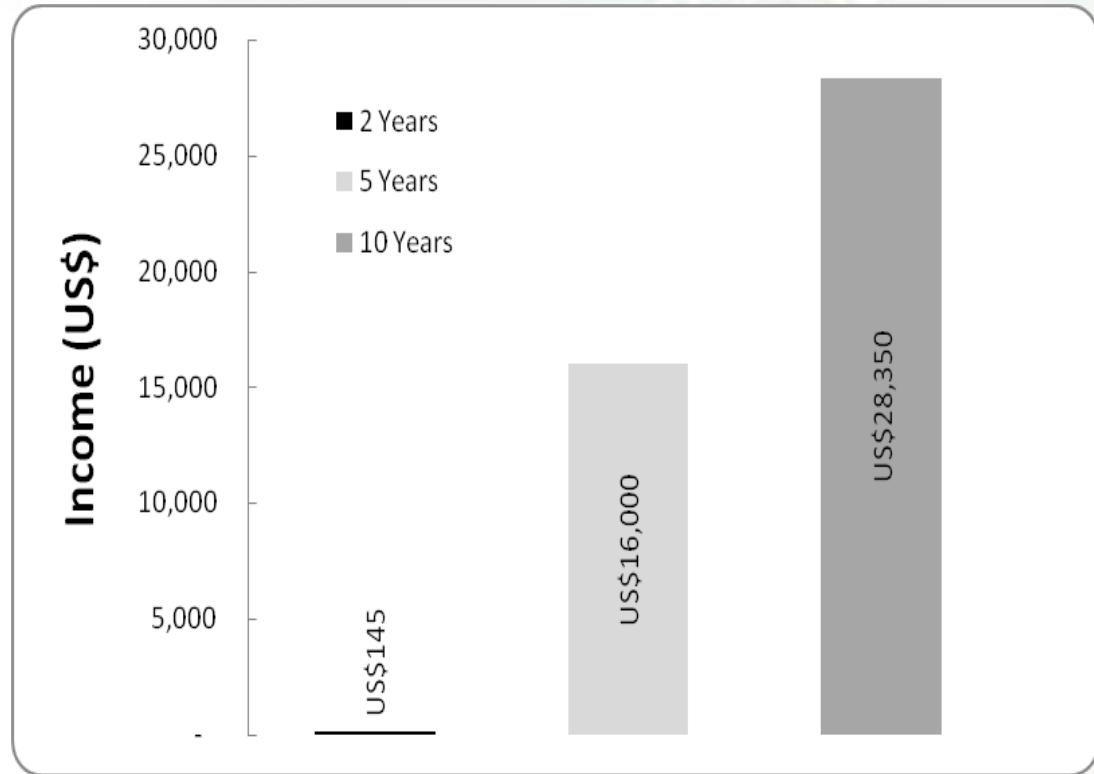


Cumulative representation of income generated from group sales of *Cola spp* and number of households involved from 2010 to 2012

Revenue (USD) — Number of Households



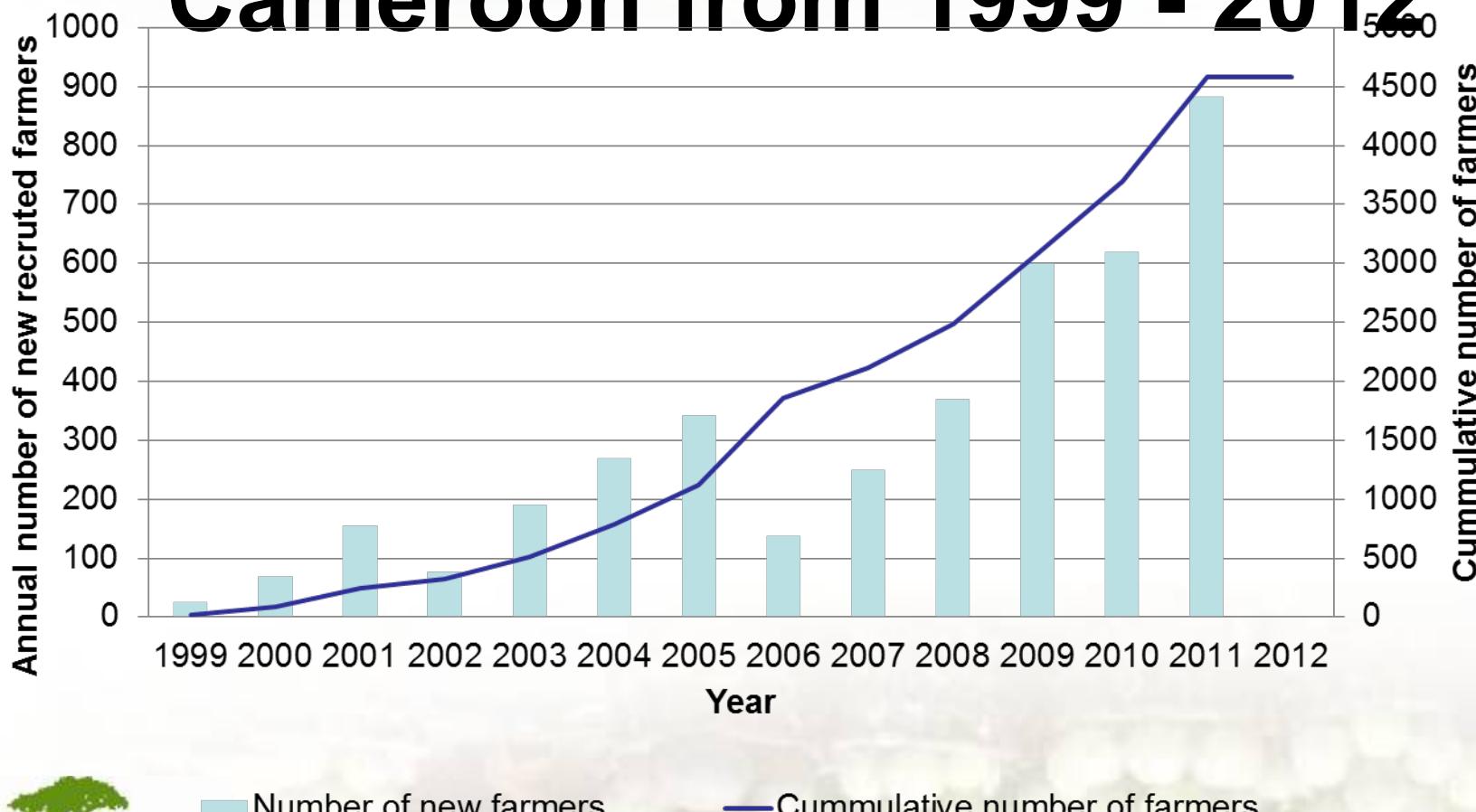
Income generation



Income generated from plant sales at RRCs centers after 2, 5 and 10 years.



Number of farmer's that collaborated with ICRAF in Cameroon from 1999 - 2012



The right tree for the right place

1. Trees for Products



fruit



firewood



medicine



income



sawnwood



fodder

2. Trees for Services



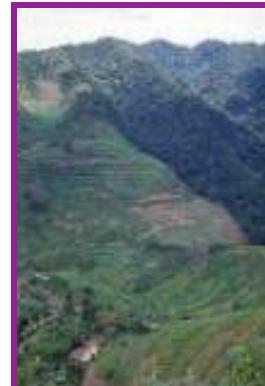
soil
fertility



carbon
sequestration



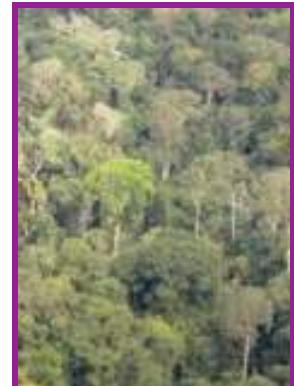
soil
erosion



watershed
protection



shade



biodiversity

Fruiting calendar of some indigenous fruit trees in West & Central Africa

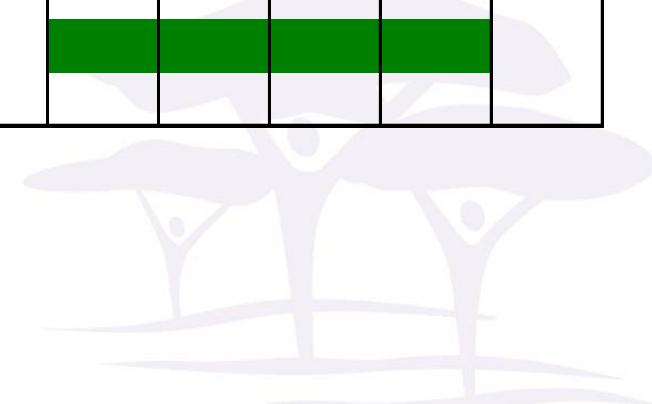
Tree species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Irvingia wombolu</i>												
<i>Cola</i> spp.												
<i>Dacryodes edulis</i>												
<i>Garcina kola</i>												
<i>Irvingia gabonensis</i>												
<i>Ricinodendron heudelotii</i>												

Safou variants

Early maturity: April - May

Normal: June - September

Late maturity: October - March



Acknowledgements



Governments of:
**Cameroon, DRC, Nigeria, Ghana, Mali, Niger,
Senegal, Burkina Faso, CDI**



**Partner and
beneficiaries**



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Thank you for
your kind
attention

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