Cocoa Plants Propagation at NESTLE R&D ABIDJAN

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2016 Next Generation Cocoa Research Symposium

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We’re part of One-R&D

The Nestlé Research Network – 2013

2016 Next Generation Cocoa Research Symposium
We’re committed to the Nestlé Innovation model

**Consumer & Shopper Insights**
What is needed by consumers?

**Creating shared value & Sustainability**
Can we create value for the society and Nestlé?

**Scientific & Technological Capacity**
What is scientifically and technologically possible?

**Commercial Capability**
Do we have the commercial capabilities to do this?

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2016 Next Generation Cocoa Research Symposium

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OUR MISSION

Driving the propagation of plants to improve production and quality of coffee and cocoa in West Africa
The cocoa tree varieties and distribution

- **Criollo**: Origin Venezuela, whitish cocoa beans merchant of high quality, low agricultural value, high susceptibility to disease, 1-5% world production
- **Forastero**: Origin Amazon and grown in Africa, yellow or brown pods mature, more resistant to disease, 80-90% of world production
- **Trinitario**: Hybrid obtained from natural crossing between Criollo and Forastero, strong but susceptible to disease, 10-20% of world production
- **National**: similar to the Forastero cacao but with a fine and a characteristic aroma. (Lerceteau et al. 1997)
BACKGROUND AND JUSTIFICATION

- Phytosanitary constraints

- Pathogenic fungal

  - Cocoa Swollen Shoot: Babnavirus: non-enveloped viruses, bacilliform particle morphology with a double-stranded DNA (Sackey and Muller 2005).

- Pest and insects
  - Mirids: South east Asia (Sahbergella Sp, Sp Distanhella and Aclopetis Sp...)
  - Rodents: Rats and squirrels (Lanaud 1997).

✔ 30% of world production losses related to phytosanitary constraints
BACKGROUND AND JUSTIFICATION

- Economic Constraints

  - Old plantations > 25 years old
  - Low yield (250 kg/ha)
  - Traditional Agricultural practices
  - Inadequate dissemination of research products
  - The limited storage conditions and storage thus causing sudden changes of cocoa costs on the international market
  - Lack of labour force, Conflict
Planting material currently used by farmers in Côte d’Ivoire is hybrid seeds or called “tout venant”

- Yield of 400-500 Kg/Ha
- Strong heterogeneity between trees within a single descendant
According these observations, improvement and propagation of cocoa trees become a great importance, especially for NESTLE

WHAT DO NESTLÉ TO ADDRESS THESE PROBLEMS ?

- Breeding programs in West African countries (CocoaAction, CLASS, etc…)

- Propagation of elites Planting Material
  (Somatic embryogenesis, orthotropic cuttings, Hybrid seedlings)

- Demoplots, Technology transfer, ….
A. SOMATIC EMBRYOGENESIS IN LABORATORY

Propagation Lab
Area: 800 m²
Potential: 500,000 plants/year

Greenhouse
Area: 1512 m²
Capacity: 1 MiO plants/year

Nurseries (2)
Area: 3000 m²
Capacity: 1.5 MiO plants/year
B. ORTHOTROPIC CUTTINGS

Multiplication of elite clones via rooted cuttings on Zambakro Experimental Farm

Mother Garden
- Area: 2.3 Ha
- Number of cocoa trees: 19000
- Potential of production: 1 Mi0/year

Nursery
- (Rooting stage)

Results
- Improvement of cuttings production (rooting score, substrates formulation)
- Evaluation of morpho-genetic aspects of trees (with CNRA on their stations)
- Cuttings production for trials and Demoplots
THE GLOBAL PICTURE, ACHIEVEMENT TO DATE

- 30 Demoplots installed at farmers level
- 6 trials on research stations for SE and OS plants evaluation
- 5 MiO plants produced and distributed since 2010
- 450,000 SE plants produced and 100,000 distributed

Partners: CNRA, ANADER, WCF, BioPartenaire, Olam,
"...empowered farmers, better agriculture, better food..."
CONCLUSION & PERSPECTIVES

Nestlé is ready to work with other partners:

✓ For developing elite cacao varieties (Breeding programs, Biotechnology…)
✓ Transfer its plant production technologies and Plants Distribution processes
✓ Create a permanent exchange framework to share experiences and Knowledge
THANK YOU FOR ATTENTION