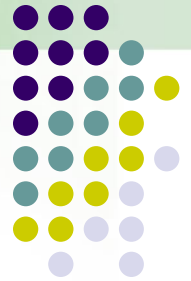


GCP ARM 2007 Benoni



# Genotyping Support Services

Results from the trial phase

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# Rationale (1)

- Meanwhile, developing countries lag **behind** in the use of these technologies
- The developed world is accelerating progress in plant breeding thanks to better technology, including **markers**
- GCP contributes to develop more technology, especially for **developing** countries
- There are many products in the GCP pipeline
- We need people capable of taking them up when released

## Rationale (2)

Technology adoption is needed in developing countries

What can GCP do?

- 1) Setting up molecular labs
  - not cost-effective
- 2) **Provide the service : market offer**

**How?**

# What is the GSS?

A service for ...

- **Breeding Programs** and **Germplasm Scientists** in developing countries
- Access to marker technologies by **hiring** genotyping work from cost effective laboratories
- Also, it offers statistics training to beneficiaries to assure
  - the correct **interpretation** of the data and
  - a good **implementation** plan

# Activities (1)

- Twenty-two (22) NARS contacted
- **Eight** (8) applications selected to **proof** the concept
- Supporting **legal documents** designed consistent with GCP policies
- **Diverse** options of service **providers** tested
- Solutions devised for the problems or difficulties encountered

## Activities (2)

Crop and sample size	Service providers	Type of marker	Objective	Beneficiaries
306 Musa samples	DArT P/L	DArT	Germplasm characterization	EMBRAPA-Cruz das Almas, Brazil
21 Musa samples	DArT P/L	DArT	Germplasm characterization	University of Southern Mindanao Research-Mindanao, the Philippines
Two populations for a total of 207 potato individuals	DArT P/L	DArT	Mapping insect traits	Instituto de Investigaciones Agropecuarias-Osorno, Chile
110 cassava families	CIAT	SCAR	MAS for cassava mosaic disease	Mikocheni Agricultural Research Institute-Dar es Salaam, Tanzania
547 cassava individuals	CIAT	SCAR+SSR	MAS for cassava mosaic disease	National Root Crops Research Institute-Umuahia, Nigeria
593 cassava individuals	CIAT	SCAR	MAS for cassava mosaic disease	National Crops Resources Research Institute-Kampala, Uganda
157 groundnut accessions	ICRISAT	SSR	Germplasm characterization	Fundación PROINPA-Cochabamba, Bolivia
415 potato accessions	Genome Quebec	SSR	Germplasm characterization	

# Activities (3)

- Workshop: data analysis + implementation plans
- Participant profile: *breeders* and germplasm *managers*
- Venue: *Instituto Agronómico Mediterráneo de Zaragoza* (Spain)
- Instructors: Fred **van Eeuwijk**, Marcos **Malosetti** and Hans **Jansen** from *Wageningen University*

# Achievements

- Legal structure
- A **defined** administrative process
- Linkages build with 2 **public** + 2 **private** genotyping facilities
- Strong ties with 7 teams: Africa, Asia and Latin America
- 267.791 data points generated
- 4 crops

# What the beneficiaries plan to do with the results?



- After receiving their genotyping data sets, but before the workshop
- Each participant was asked what they expected to accomplish or gain with the data
- The following slides show their responses

# Impact: *Musa*

- Understand germplasm structure in detail
- Identify redundancies and decipher genome composition at the individual level
- Compare with the GCP reference set
- Integrate previous characterization data of varied types with the new molecular data
- A publication in process
- Use germplasm more intensively

# Impact: potato and groundnut



- Analyze molecular data jointly with agro-morphological traits
- Associate genetic diversity with geographical distribution
- Strengthen collaboration between breeders and biologists
- Design better core collections
- Identify redundancies and gaps in the collection
- Refine *in situ* conservation practices
- Refine germplasm prospecting expeditions

# Impact: potato

Located: markers associated to resistance to  
**Potato Tuber Moth**

- Preliminary results show 9 putative markers associated to factors of resistance
- The same data will be used to study resistance to diseases (viral + fungal), Colorado Beetle, nutritional factors, starch characteristics, etc.
- A publication in process
- Enhanced breeding method to introgress traits from wild relatives

# Impact: Cassava

- Advanced progenies and families **screened** for CMD2 in the programs of Nigeria, Uganda and Tanzania
- The breeding cycle can be **reduced** from 8-10 to 6 years
- High precision will generate significant cost **reductions** in field operations
- Leads found for **new** sources of resistance to CMD
- At least a publication is expected

# Conclusion of trial phase

## Characteristics of the GSS products

- **Little room** for uncertainty
- **Fit** pre-determined goals
- **Immediate** impact
  - Building capacity
  - Improving cost efficiency
  - Reducing product development time
  - Opening new opportunities
- Support and motivate '*champions*' in developing regions
- Pave the way for GCP products already in the pipe line

# Is this enough?

- The gains mentioned are just **side** *effects*
- The **end** goal is to see beneficiaries become
  - **self sufficient** in marker technology
  - **ready** to up take the coming new developments

# Next

- A Call announced August 15<sup>th</sup> 2007 for a new round of genotyping proposals **closing** October 15<sup>th</sup>
- Eligibility, *breeders* and germplasm *managers*
  - Academia, Civil Society Organizations, NARS
  - Developing countries
  - 18 GCP crops
- Offer:
  - 15.000 Data points for applications based on SSR, SCAR, etc...
  - Or, 384 plants with DArT, SNP ... → more than 15.000 data points
  - Statistics training

# GSS sustainability

- We want to generate technology adoption **not** dependency. How to proceed?
  - ✓ Teach “**how to**” do the process
  - ✓ **Initially** almost total coverage is provided
  - ✓ But coverage will be reduced in each following round until beneficiaries **assume** total costs
    - ✓ By then, they would know how to effectively apply the technology on their own
    - ✓ **And** could continue to receive advice from GSS

# GSS limitations

- We **only** cover those that can benefit from markers but need help to get access
- Target only 18 crops
- The support is for **short term**
- The offer per applicant is **limited** in size
- The number of beneficiaries is **limited**
- *... flexible within our limitations*

*Among others,* **thanks to**

GCP donors

Participating institutions and scientists

SP1, SP3 and SP5 leaders

GCP + Bioversity International legal experts

Statisticians from WUR

External crop experts

GCP communications and administrative staff

Genotyping providers

