Genotyping Tools and Services

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Comments or questions?

Instructions for participants:

Chat question:
- Click Chat
- Click Session
- Add your question

For Video Question:
- Ask to share video
- You will be in queue. Moderator grants access / can control mic
- Ask your Q when introduced
- You can stay to discuss. Or click “Leave” to turn off video
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Module 3- Genotyping Tools and Services

1. Target markets are defined for each product pipeline
2. Breeding program & seed system capacities assessed
3. Product profiles defined and prioritized
   - Advancement meeting determines which products pass to the next phase
4. Breeding scheme optimized to deliver product profiles
5-8. Appropriate technology used to execute crossing, multiplication, evaluation & selection
9. Product evaluation
10. Delivery strategy
11. Scale-out
Criteria for Selecting Genotyping Platforms

- Trait Specific
- Background recovery
- QA/QC
  - Low density platform

- Genomic Selection
- Fingerprinting
  - Mid density platform

- Elite parental screening
  - High density platform

By 2021
Sampling Logistics Training
Low- & mid-density genotyping services

World-class services at reduced cost for CGIAR and NARS breeding programs

Low-cost, accurate genotyping services offer several different applications with the potential to accelerate the production of improved varieties and create efficiencies in crop breeding programs. However, smaller breeding programs may not have the know-how or sufficient demand for genotyping to be beneficial and economical.

The CGIAR Excellence in Breeding Platform (EiB) aggregates demand from several breeding programs to negotiate competitive genotyping prices with vendors, offering a streamlined service along with applications-oriented training and advice. This document introduces the EiB low-density and mid-density genotyping services for potential users.

How does it work?
The low- and mid-density services are based on contracts negotiated by EiB with validated DNA extraction and genotyping service vendors based on anticipated bulk demand across eligible CGIAR and national agricultural research (NARS) institutions.

How can I get started?
Start by getting in touch with EiB genotyping contacts for advice, procedures and costing/budget questions. For example, it is important to follow the correct material sampling protocols to obtain high-quality genotyping data.
Low Density (HTPG) Platform

• August 30\textsuperscript{th}, 2016- INTERTEK & ICRISAT
  • Ending in December, 2020

• Centers under the agreement:
  • 30+ CGIAR and NARs users to date (24 countries)
  • Private partners,
  • USDA, Embrapa, CIRAD, CSIRO,....

• Target Crops:
  • Wheat, Maize, Rice, Groundnut, Chickpea, Pearl Millet, Potato, Cassava, Sorghum, Cowpea, Common Bean, Soybean, Pigeon Pea, Finger Millet, Yam, Banana, Tilapia,...
  • Tomato, Cocoa, Coffee (soon)
Mid Density Platform

• Launched in August of 2020
• Services:
  – Extraction: Intertek SWE, IND & AUS
  – Genotyping: DArTag (Targeted amplicon sequencing)
  – 1-4K SNPs @ $11 (384) and $10 (1536)
  – 15 business days turn around
  – Setup cost: $12 per assay (6 weeks)

• Pilot crops:
  – Rice, Potato, Common Bean, Wheat, Maize (validated)
  – Cowpea (under verification)
  – Sorghum (pending submission)
  – Blueberry, Alfalfa, Sweet potato, Salmon (USDA Breeding Insight)
Coming soon in 2021...

• Low density KASP & Mid density marker ‘database’
• E-learning tools to facilitate usage of shared services
• New Low density (formerly HTPG) service agreement (Under review)
• Online sample submission tools (Q2-Q3, 2021)
• High density genotyping solutions (Further engagements)
• Regional workshops- Q2 2021 onwards
• New work plan and priorities- alignment with CtEH
Genotyping under CtEH Network Strategy

Centralized Deployment Strategy
1. Unified trait introgression (hubs)
2. Routine QA/QC
3. GS strategy (crop specific)

Network Coordination & Support
1. CGIAR and NARs networks
2. Technical advisory and logistics
3. Capacity building & knowledge sharing

Operationalized Genotyping
1. Genotyping charge accounts
2. Reduced transaction costs
3. Data point allocation (future state)
Thanks!
Questions?