



A CGIAR Challenge Programme

3rd call for Genotyping Support Service proposals

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**The CGIAR Generation Challenge Programme (GCP)
in coordination with**

the Global Crop Diversity Trust

announces the

**3rd Call for Proposals by GCP's
Genotyping Support Service (GSS)**

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1 Submission and selection: modes and dates

Submission

1 November 2009–**17 January 2010** (superseding all previous deadlines, as announced in <http://www.generationcp.org/latestnews.php?i=1778>).

Proposals to be submitted online at <http://www.gcpwms.info/gss/apply/1608>

This link will be activated on 1st November and deactivated on 18th January 2010.

Selection

Selection will start when the call closes, and implementation will begin as soon as selection is completed (see 3.3).

2 Overview

Modern plant breeding programmes need novel genetic variation and effective breeding tools and strategies to meet the growing global demand for food. The CGIAR Generation Challenge Programme (GCP) contributes to poverty reduction and food security by developing tools and

techniques to enhance the knowledge and use of genetic resources and by using comparative genomics approaches for gene discovery to improve plant breeding programmes for the benefit of the resource-poor. More information on GCP can be found at www.generationcp.org, and a list of our funders at <http://www.generationcp.org/gcppartners.php?da=0646141#funders>

Box 1. Complementary call by the Global Crop Diversity Trust

Recognising the bottleneck in the use of germplasm collections, in 2007, the **Global Crop Diversity Trust** initiated a competitive grants scheme to support the evaluation of crop genetic resources. These grants enable breeders and other scientists to screen germplasm collections for phenotypic characteristics of particular importance for adaptation to climate change, and to have such information in the public domain. This is the third call under this Award Scheme. All interested parties are hereby invited to submit proposals for consideration by the Trust for an award in early 2010. The current call for proposals and further information are available at <http://www.croptrust.org/main/screening.php?itemid=516>

3 GCP call for proposals: Genotyping Support Service

3.1 Scope and objectives

Box 2. GSS objectives

Objectives

GSS aims to help spread the benefits of marker technology in the developing world through the following objectives:

1. *Technology access*: facilitating developing world researchers' access to molecular marker technologies for germplasm analysis;
2. *Capacity-building*: training researchers in data analysis and knowledge application; and,
3. *Sustainability and spread*: to build a core of researchers who can continue to use the technology, independent of GCP support.

While molecular marker technology accelerates progress in plant breeding programmes in the developed world at unprecedented rates, most countries elsewhere are lagging behind in the use of these technologies. The reasons for this are numerous and complex, but lack of access to facilities and expertise are major causal factors. Although setting up labs could be a step in the right direction, this is quite often not an effective solution. Promoting the dissemination of molecular marker technology at the pace needed for adoption and meaningful impact requires a new approach free of local limitations. With this in mind, to assist in technology dissemination, GCP offers the Genotyping Support Service. The service is extended to breeding programmes in the developing world to facilitate their access to molecular marker technologies for the analysis of germplasm. GSS hires competent high-throughput genotyping facilities (**GF**) to conduct genotyping in a well-established and cost-effective facility. But GSS is not limited to lab services and financial support: it also includes researcher capacity development: through GSS, participating researchers are also trained in data analysis, interpretation and application of the new knowledge.

Subject to (a) the availability of suitable populations and well-phenotyped breeding materials, (b) the availability of appropriate markers to address the needs of applicants, and (c) identifying appropriate GF able to carry the specified work, GSS will produce molecular marker data to address issues such as:

- 1) Germplasm management of collections linked to breeding programmes: evaluation of diversity, accurate indexing of germplasm, comparison with GCP germplasm reference sets, detection of new alleles, etc.
- 2) Fingerprinting of parental lines for improved management of breeding populations, such as assisting decision-making to generate new genetic combinations, enhanced pedigree management, substantiation of paternity in open pollinated progenies, etc.
- 3) Measure of linkage disequilibrium (LD) in selected germplasm.
- 4) Alternative to No. 3) above, if appropriate populations are available, conventional mapping with a suitable marker technology.
- 5) Marker-assisted selection for relevant single gene traits.
- 6) Other related requests appropriate to the scope, capabilities and resources of the GSS.

Together with the genotyping outputs, the GSS commits to generate high-quality results that may be published in refereed journals. Therefore, applicants **must** be willing to publish. To this end, the GCP will provide statistical support and might cover publishing costs, where feasible.

In addition to building technical capacity in the use of this technology, a key GSS objective is helping participants understand how to outsource genotyping services to laboratories outside their countries. This will assure that they can continue using the technology independent of the GSS support, and this is indeed one of the criteria for eligibility (see also 1[d] in *Eligibility* below).

3.2 Eligibility criteria and priority

1. *Eligible organisations*: include country agricultural research programmes, academia, civil society organisations and private companies. The organisation must:
 - a. have a functional breeding programme;
 - b. be located in a developing country (see Table 1); and,
 - c. be working on the crops listed in Table 2.
 - d. Applicant organisations should be willing to incorporate the use of molecular marker technologies with a long-term perspective, ie, demonstrate readiness to take the necessary steps towards self-sufficiency in outsourcing genotyping work in the medium term.
2. *Priority* will be given to applicants:
 - a. in organisations already engaged in GCP projects or activities; and/or
 - b. who qualify for any of the other simultaneous and complementary call by the Trust (see Box 1 above)
3. Applications should have potential for direct impact on the 15 GCP target farming systems at http://www.generationcp.org/UserFiles/File/gcp-target-systems_brief.pdf
 - a. Applicants may benefit from the GSS only **once**. However, the GSS reserves the right to include previous applicants in subsequent GSS opportunities.
4. Applicants who were unsuccessful in previous calls are eligible to re-apply.

3.3 Application, selection and implementation

- 1) Application:
 - a) Acceptance of the terms and conditions: Applicants should **first read and ensure that they understand and can comply with the obligations before submitting the 'GENOTYPING SERVICE REQUEST**

AGREEMENT'

(http://www.generationcp.org/UserFiles2/File/SP5/GSS/3rd-call_Oct-2009/GENOTYPING-SERVICE-REQUEST-AGREEMENT.pdf).

- b) For full details on the application process, applicants are advised to read the 'How to submit a GSS proposal: A step-by-step guide' (http://www.generationcp.org/UserFiles2/File/SP5/GSS/3rd-call_Oct-2009/GSS-2009_Step-by-Step-guide-for-proposal-submission_Octo%2009.pdf)
- c) *Mode and due dates:* From November 1st 2009, proposals will be accepted online (<http://www.gcpwms.info/gss/apply/1489>). ***This URL will be activated on November 1 2009 and deactivated on 18 January 2010.***
- 2) Selection and notification:
- Proposals will be evaluated based on the eligibility criteria, the potential for impact and a fair balance in resource allocation across institutions and regions.
 - Applicants will be informed of the outcome of the evaluation.
- 3) Implementation
- Proposals will receive final approval **only** after successful applicants send the required supporting data, and the DNA is submitted to the GF within the agreed schedule.
 - Upon approval of the proposal, GSS will locate a GF to conduct the work according to the approved workplan.
 - The applicant will be notified of the selected GF and a schedule established for producing and sending DNA or tissue according to laboratory specifications, and in compliance with the legal requirements of source and destination countries.
 - GSS will sponsor a workshop where first-time grantees will have the opportunity to analyse their data and prepare an implementation plan based on the results obtained. The content of the workshop will include statistical analysis, 'best practices' for experimental design and data management. This activity is in collaboration with GCP's Subprogramme 4 and is coordinated by GCP's Statistical Support Helpdesk at:
<http://www.generationcp.org/bioinformatics.php?da=08106902>

NB: Based on previous experience, to ensure all funds are disbursed to the maximum number of recipients possible, an excess of proposals may be accepted as eligible for funding. Thereafter, actual funding will be on a 'first come, first served' basis.

3.4 Subsistence Use Agreement, intellectual property and data policies

GSS participants are under an obligation to allow all GCP Consortium Members and other GCP researchers to use data obtained through the GSS Programme for GCP activities. To prevent dissemination of genotypic data outside GCP, participants may **request** in the Genotyping Services Request Form that data relating to germplasm that they have submitted for analysis be treated as confidential. If a participant requests such confidentiality by so marking the Request Form, GCP will treat the data as confidential in accordance with the Amended GCP Consortium Agreement, at <http://www.generationcp.org/UserFiles2/File/Who-we-are/Consortium->

[Committee/Amended-Consortium-Agreement_web-version.pdf](#), except that the GCP Consortium Members' and GCP researchers' obligations of confidentiality with regard to such data shall expire **twelve months** for annual crops and **twenty-four** months for perennial crops after the date of their designation as confidential.

3.5 Scope of the proposals and funding

- 1) Applicants may request genotyping of up to 150,000 data points if using diversity array technology (DArT), or up to 15,000 data points if using microsatellites (SSR). Single Nucleotide Polymorphism (SNP) marker technologies may also be considered.
- 2) The GSS reserves the right to increase the final size of the approved proposals.
- 3) Genotyping costs under the GSS Programme will be covered in full.
- 4) The GSS will also fund the participation of first-time grantees in the data analysis workshop. Subsequent participation in the workshop would be at the grantee's own cost.

3.6 Timeframe

Approximately three to ten months, depending on the individual factors of each successful proposal, such as availability of DNA or tissue and how rapidly applicants are able to comply with procedures.

3.7 Contact person

In case you have any questions or require further information, please contact Humberto Gómez Paniagua (h.gomez@cgiar.org), GSS Coordinator.

4 GCP's Molecular Breeding Platform

GCP recently launched a new Project, the *Molecular Breeding Platform (MBP)*, which offers 'Marker Services' (MS) (more on MBP at: <http://wiki.cimmyt.org/confluence/display/MBP/Home>).

While MS and GSS have much in common they are intended to complement each other, they also have clear contrasts:

- GSS provides and financially supports access and training in the use of molecular markers to research organisations in the developing world. Because the GSS operates through an open call, it cannot process requests with specifications and timing that match breeder requirements for true marker-assisted breeding. Therefore GCP created the MS for access to marker technologies in a way that closely matches the need of the breeders.
- Unlike GSS, MS is open to any organisation, working anywhere in the world, on any food crop. MS will accept any sample size to be genotyped with any marker technology that is publicly available. MS has agreements with reliable, high-performance laboratories that provide their services under special conditions and rates. The box below outlines the major contrasts between GSS and MS.

One important difference between GSS and MS is that users of the MS pay for the laboratory services. The intermediation costs of MS, however, will be subsidised by GCP funders until 2011, meaning cost-free access will cease in 2011.

Box 3. Differences between GSS and the MBP's marker services

	GSS	MS
Access	By open call only	At any time
Clientele	Developing countries	Any country
Crops	Selected list	Unlimited food crops
No. of samples	Limited	Unlimited
Funding support	Highly subsidised	None
Data analysis support	Yes	On demand
Turnaround time	Variable	Fast

Table 1. Developing Countries (as defined by the World Bank)

Afghanistan	Dominica	Lithuania	Serbia and Montenegro
Albania	Dominican Republic	Macedonia, FYR	Seychelles
Algeria	Ecuador	Madagascar	Sierra Leone
American Samoa	Egypt, Arab Rep.	Malawi	Slovak Republic
Angola	El Salvador	Malaysia	Solomon Islands
Antigua and Barbuda	Equatorial Guinea	Maldives	Somalia
Argentina	Eritrea	Mali	South Africa
Armenia	Estonia	Marshall Islands	Sri Lanka
Azerbaijan	Ethiopia	Mauritania	St. Kitts and Nevis
Bangladesh	Fiji	Mauritius	St. Lucia
Barbados	Gabon	Mayotte	St. Vincent and the Grenadines
Belarus	Gambia, The	Mexico	Sudan
Belize	Georgia	Micronesia, Fed. Sts.	Suriname
Benin	Ghana	Moldova	Swaziland
Bhutan	Grenada	Mongolia	Syrian Arab Republic
Bolivia	Guatemala	Morocco	Tajikistan
Bosnia and Herzegovina	Guinea	Mozambique	Tanzania
Botswana	Guinea-Bissau	Myanmar	Thailand
Brazil	Guyana	Namibia	Timor-Leste
Bulgaria	Haiti	Nepal	Togo
Burkina Faso	Honduras	Nicaragua	Tonga
Burundi	Hungary	Niger	Trinidad and Tobago
Cambodia	India	Nigeria	Tunisia
Cameroon	Indonesia	Northern Mariana Islands	Turkey
Cape Verde	Iran, Islamic Rep.	Oman	Turkmenistan
Central African Republic	Iraq	Pakistan	Uganda
Chad	Jamaica	Palau	Ukraine
Chile	Jordan	Panama	Uruguay
China	Kazakhstan	Papua New Guinea	Uzbekistan
Colombia	Kenya	Paraguay	Vanuatu
Comoros	Kiribati	Peru	Venezuela, RB
Congo, Dem. Rep.	Korea, Dem. Rep.	Philippines	Vietnam
Congo, Rep.	Kyrgyz Republic	Poland	West Bank and Gaza
Costa Rica	Lao PDR	Romania	Yemen, Rep.
Côte d'Ivoire	Latvia	Russian Federation	Zambia
Croatia	Lebanon	Rwanda	Zimbabwe
Cuba	Lesotho	Samoa	
Czech Republic	Liberia	São Tomé and Príncipe	
Djibouti	Libya	Senegal	

Table 2. List of eligible crops

- | | |
|---------------|----------------------|
| 1. barley | 10. <i>Musa</i> |
| 2. cassava | 11. <i>Phaseolus</i> |
| 3. chickpeas | 12. pigeonpeas |
| 4. coconuts | 13. potatoes |
| 5. cowpeas | 14. rice |
| 6. groundnuts | 15. sorghum |
| 7. lentils | 16. sweet potatoes |
| 8. maize | 17. wheat |
| 9. millets | 18. yams |