



A CGIAR Challenge Programme

PROGRESS REPORT

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Prepared by:
Robert S. Zeigler, Programme Director, and Jennifer Nelson, Communications Assistant

CIMMYT
Apdo. Postal 6-641
06600 Mexico, D.F., Mexico
Phone: +52 55 5804 2004
Fax: +52 55 5804 7558

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Executive Summary

The Generation Challenge Programme was created to allow the CGIAR to capture the benefits of the simultaneous revolutions in biology, information management, and telecommunications and direct them to problems confronting the resource poor farmers in some of the world's most difficult and marginal environments. These revolutions allow us to effectively and efficiently use our wealth of genetic resources in a way that crop improvement can benefit from the insights gained from comparative biology, molecular biology and genetics. This powerful biological discovery has revealed the underlying genetic similarities across crop species and allows parallel advances in related, and sometimes "orphaned", crops.

However, taking advantages of these similarities requires a new way of conducting research and building partnerships. The era of comparative biology for crop improvement will necessarily be based upon fluid research programmes that involve teams with expertise on different crop species, working in different institutions and separated by vast distances. By being outside the boundaries of traditional CGIAR centres and partners, the GCP can readily allocate resources to create multi-institutional partnerships. This Challenge Programme capitalizes on the greatest strengths of the CGIAR – its scientific capital, genetic resources, and strong alliances with NARS – and strives to neutralize one of its serious weaknesses – the isolation of stand-alone centres.

First Year Progress

Research Progress and Competitive Grants Programme

Research in the Generation Challenge Programme (GCP) is well underway, and the future looks bright. Initial commissioned research and support activities focus on establishing the baseline diversity analysis of germplasm collections and the bioinformatics support services. The Programme is vigorously creating the platform technologies in informatics, communications, comparative biology, and capacity building required to implement its global programmes. The pieces are in place so that well before the end of the first year working groups will have agreed upon standards in marker selection, bioinformatics, data analysis and management, plant transformation, and phenotyping protocols. By the end of its first year, the GCP will have undertaken an unprecedented characterization of core germplasm collections. A Needs Assessment exercise among senior NARS research directors will capture NARS requirements to become active members of the GCP.

One of the most significant innovations from the GCP is to fund at least half of its research via a competitive, externally peer-reviewed granting process. This will attract new partners and reward creative thinking, as well as provide the credibility that is required to make our multilateral research approach viable. Our first call for proposals for the competitive grants programme went out to over 60 research organizations early in April and the independent review panel is expected to review pre-proposals in late May.

Challenge Programme Administration

An effective management team is essential to execute the complex tasks envisioned for the Generation CP. A Director was hired in late 2003 following an open international search, and an excellent support team in communications, finance, and administration were assembled from among the host centre's staff. In the first quarter of operation the four Subprogramme Leaders were appointed, again following an open advertisement and application process from among Consortium members. A Capacity-Building Coordinator and communications assistant complete the GCP management team. The Subprogramme leaders were recruited from CGIAR Centres and non-CGIAR members of the Consortium. The spirit of collaboration that we promote extends even to the Subprogramme Leaders' appointments: half of their time is spent on Challenge Programme activities and half within their own institutes. This inclusive blend allows us to capture both expertise and institutional memory within the system as well as bring in new perspectives from outside.

The Generation Challenge Programme has developed a communications strategy to reach its diverse constituency: the basic science and crop improvement communities, NARS, donors and policy makers, and the general public. Following extensive consultation a new name and logo were adopted that give an identity to the Programme free from preconceptions associated with genetic engineering. We have launched an information-rich Web site and have a monthly e-newsletter that reaches over 300 people, inside and outside the CP consortium. We have engaged a professional graphics design firm to help us put a human face on our Web site and other communications materials. We have been and will be represented at a number of major scientific forums. For example, at the Plant and Animal Genome Conference in January (the world's largest assembly of plant molecular biologists and geneticists), over 300 people attended the Challenge Programme session. The GCP has received prominent coverage in important international publications, such as *Genome Technology* magazine.

The Challenge Programmes were designed to transcend the structural and historical limitations of the CGIAR system. The Generation Challenge Programme has taken this mandate to heart and its members' commitment is demonstrated by their self-imposed \$400,000 annual in-kind contribution requirement from each member. The first year research plan includes unprecedented collaborations across crops and institutes. The partnerships the GCP has facilitated between CGIAR centres, ARIs, and NARS would not have been possible under the old system. True, there are increased transaction costs in establishing the Challenge Programmes, but we believe that they are necessary costs that ultimately add real value to existing investments. We are mindful of the risks and seek to reduce these transaction costs and to increase efficiencies. We respect our scientists' time by scheduling GCP meetings around other international events likely to be of importance to them, adding value to their travel commitments. The management team is actively looking for opportunities to interact at various levels via electronic means.

New Partnerships

We are actively working with the other Challenge Programmes to avoid duplication of efforts and other inefficiencies. For example we are working with HarvestPlus to develop a substantial joint research and capacity building effort in eastern and central Africa under the auspices of the NEPAD Biosciences Facility. Likewise, recognizing that we will be targeting the same farmers, and working with the same institutions on many of the same crops in the same countries, we will

develop a common end-user technology delivery approach. A portion of the Water and Food CP research agenda dedicated to improving crop water use efficiency also intersects with our principal focus, and we have entered discussions with their Theme Leader to determine how we can best collaborate.

To assure that we maintain our focus and are able to quickly adjust to new circumstances we are working with GFAR to establish a Stakeholders Committee. We expected to complete this task by July.

A draft Consortium Agreement has been created after extensive input from our members as well as outside legal expertise. It is now being reviewed by all members. This document lays out the operating principles of the Consortium, sets forth procedures for the functioning of the Programme Steering Committee, and clearly states our Intellectual Property policies. While we now have an IP position that has buy-in from Consortium members, the GCP has initiated discussions with CAMBIA in Canberra to explore the development of “open source biotechnology” along the lines of the BIOS programme being proposed by CAMBIA. We are carefully considering approaching donors for support, with CAMBIA using this CP as a case study of their open source approach.

The GCP management team has been actively cultivating new donors for this CP. We believe that significant new sources of funding can be made available to the Programme from non-traditional sources. We recognize, however, that we must demonstrate to potential donors that the appropriate research, management and governance structures are in place to justify their investments. The progress summarized above should go a long way to that end.

Response to Previous ExCo Inquiries

Prior to, and in the minutes of its July of 2002 meeting the ExCo raised a number of questions about the Generation Challenge Programme. The drafters of the CP concept and proposal responded to those reservations, but we would like to address them again, given the progress of the GCP this year and recent developments. These issues are dealt with in more depth in the body of this progress report. The questions were:

Is the focus of the Challenge Programme appropriate, with 22 crops considered and only one target, drought tolerance?

The GCP’s focus takes advantage of the expertise of our various member organizations. While all 22 mandated crops will benefit from Challenge Programme research, the CP membership decided at the Technical Planning Workshop last August that, for practical reasons, the highest priority, or Phase 1, crops to be addressed in the first years will be wheat, barley, sorghum, maize, rice, cowpea, common bean, chickpea, cassava, potato, and *Musa*. Although much can be gained by grouping the crop species by biological family, a more explicit sharpening of focus will be brought before the PSC in its annual meeting. Drought tolerance will be a major objective of the GCP. “Low hanging fruit,” such as certain pest and abiotic tolerances that can have major impact in the short term, will also be pursued. This was stipulated in the Request for Proposals. These will be carefully chosen to represent opportunities that demonstrate the soundness of our

approach, as well as provide near-term impact so useful for donors to justify continued investment in our activities.

How can the Challenge Programme expand/enhance its partnerships with NARS; with advanced research institutes in the private and the public sector?

So far this year, communication with the Private Sector Committee of the CGIAR has already been extensive. Dr. Zeigler met with Bill Niebur in March, and Dr. Niebur, chair of the PSC, presented the GCP's first quarter progress report to the whole committee. Dr. Neibur and colleagues from Pioneer will be visiting the CP in early May. Partnerships with NARS member institutes are also strengthening: Dr. Zeigler met with Embrapa administrators in April to discuss their enhanced participation in the GCP. The Stakeholders' Committee, the Needs Assessment meeting, and the expected partnership with NEPAD are powerful mechanisms to assure that NARS will be brought into the CP early and effectively.

The GCP is recruiting advanced research institutions participation via a number of paths. 1) We are using a number of high-profile international meetings to alert the scientific community of the opportunity to participate. 2) We have adopted a competitive grants approach which is a familiar mechanism to potential partners in ARIs. 3) We have directly approached a number of ARIs not already in the Consortium to lay the ground work for their participation. 4) We are joining with non-traditional ARI potential partners to jointly seek funding not previously available to the CGIAR. An example of this is a proposal under preparation with Cold Springs Harbor Laboratory to the US National Science Foundation's International Computational Networking Programme. Such a proposal would not be possible without the existence of this Challenge Programme.

There are two major impediments to participation of the private sector in the GCP: 1) no clarity around who exactly a company would be entering into a partnership with, should it wish to participate; and, 2) no rules relating to intellectual property. The creation of a formal consortium with clear IP policies addresses both of these issues directly.

What mechanisms should be put in place to enhance capacity building efforts?

The GCP's capacity-building activities for the first year, especially the Needs Assessment for NARS Workshop to be held in August, will serve to involve more NARS scientists in the individual research and training projects of the GCP. There are capacity building activities built into each Subprogramme this year. The competitive grants process stipulates that capacity building must be built into each proposal. The Needs Assessment Workshop to be held this summer will further outline NARS' needs for training and guide coordinated capacity-building activities in future years of the GCP. Another important component of capacity-building is the delivery mechanisms the GCP and NARS will use to get products to farmers' fields. A thorough analysis of the delivery mechanisms that have existed in developing regions over time will allow the GCP to maximize impact by capitalizing on active and dormant networks. GCP is working with the other Challenge Programmes in this effort and the analysis will be supported by the McKnight Foundation.

How will IP issues be addressed?

The GCP has developed an IP management plan based on a set of Guiding Principles agreed among the consortium members. The Guiding Principles are complementary to the IP policies of the consortium members and are specific to the work of the Challenge Programme. The foremost consideration in the development and articulation of the Guiding Principles was to make the outputs of the Programme available as public goods, and to facilitate, in particular, an access strategy to ensure direct benefit for the resource-poor. The Guiding Principles will be used to assist the development of effective partnerships with the private sector. These Guiding Principles have been codified in the draft Consortium Agreement. All commissioned research and competitive grants are subject to a research agreement that refers back to the IP policies stated in the Consortium agreement. We have also asked for each member to clearly state which IP they are bringing to the GCP.

How should the competitive grants process operate?

The Call for Proposals for the competitive grants programme of the GCP was sent out in early April. The thematic areas addressed completely coincide with those outlined in the original CP document. The Call for Proposals requires a NARS partner for every proposal and strongly encourages the involvement of outside institutes. Proposal evaluation and selection is a two-step process consisting of a pre-proposal and full proposal phase. The pre-proposals and full proposals will be evaluated by an external panel of experts. The panel will be composed of recognized experts in the fields of germplasm conservation and analysis, comparative genomics, bioinformatics, and molecular biology. Approximately half of the pre-proposals will be advanced to full proposal stage. Competitive grants will cover at least half of CP research funds for 2005. The review panel will make recommendations to the Programme Advisory Committee regarding which proposals should be approved. Final approval will be made by the Programme Steering Committee. See attached Call for Proposals (Appendix 3). Commissioned research will be the strategic “glue” between the competitive grants.

How is the Challenge Programme different from the core mandates of some CGIAR centres?

At the highest level, all of the Challenge Programmes share common mandates with the core mandates of their participating centres. It makes sense, then, that the CPs are within the overall CGIAR framework. This Challenge Programme complements the commodity mandates by creating research, partnership, and impact opportunities that were not feasible under existing structures. The comparative biology approach required to take advantage of the advances in plant biology is ideally suited to a cross-cutting CP structure. Such comparative biology approaches are beyond the strict core mission of the centres.

Governance: how does the Challenge Programme bring clarity to IPR matters, understanding on partnerships, and the handling of fiduciary responsibilities?

The draft Consortium agreement clarifies the roles and responsibilities of Consortium members and the Programme Steering Committee. The agreement also provides procedures for the PSC to follow in executing its responsibilities. The IP policies of the Consortium members are clearly

spelled out and mechanisms for using protected IP are presented. It is expected that clarity in who belongs to the Consortium and what this entails coupled with a clear IP position will open the way for private sector participation in the GCP agenda.

Background

The Challenge Programme for Unlocking Genetic Diversity in Crops for the Resource-Poor creates a strong coalition of institutions dedicated to alleviating poverty by applying advances in the biological sciences to the agricultural constraints of the developing world. Uniting CGIAR centres, NARS of developing countries, and advanced research institutes in this goal, this Challenge Programme will produce a new, unique public platform for accessing and developing new genetic resources using advanced molecular technologies and traditional means.

The tools of comparative biology are being applied to unlock the genetic potential and enhancing the use of public genetic resources in plant breeding programmes. The Challenge Programme's overall development objectives are to increase food security and improve livelihoods of the poor, while reducing the impact of agriculture on the environment, in developing countries. Knowledge generation, management, dissemination, and application by the Programme will have its impact in the field as well as in building the scientific capacity in developing countries.

The goals and strategies of the Challenge Programme fall squarely within three of the eight United Nations Millennium Goals: 1) Eradicate Extreme Poverty and Hunger; 7) Ensure Environmental Sustainability; 8) Develop a Global Partnership for Development

Research Strategy and Objectives

The Challenge Programme's research is organized under five themes. Four of the themes are technological, and the fifth is the cross-programme objective of human resource development. The themes are:

- Subprogramme 1: **Genetic diversity of global genetic resources**
 - Acquire and/or develop the tools and techniques needed to identify useful genetic variation among the germplasm collections held by the CGIAR Centres and elsewhere;
 - Identify and characterize this genetic diversity;
- Subprogramme 2: **Comparative genomics for gene discovery**
 - Identify genes and pathways to use in crop improvement programmes, and identify marker systems to speed selection for these;
- Subprogramme 3: **Trait capture for crop improvement**
 - Utilize knowledge of gene function and location to improve efficiency and scope of breeding programmes for formally intractable traits

- Subprogramme 4: **Bioinformatics (genetic resource, genomic, and crop information systems)**
 - Develop integrated crop genetic resources, improvement, and bioinformatics systems to facilitate and optimize implementation of the discoveries.
- Subprogramme 5: **Capacity-building**
 - Develop a cadre of national scientists in developing countries capable of participating in all aspects of this programme
 - Raise the capacity of scientists in CGIAR scientist to fully participate in this Challenge Programme
 - Reorient the research programmes of select scientists in developed countries to address critical needs in developing countries

The Stakeholders meeting in Alexandria determined that the CP ultimately would address the needs of all 22 CGIAR mandated crops. For biological reasons the Challenge Programme organizes its work across three crop groups:

- Cereals, including the grass forages
- Root and tuber crops
 - *Musa*¹
- Legumes, including forages

Consortium Membership

Consortium members include eight CGIAR institutions (CIAT, CIMMYT, CIP, ICARDA, ICRISAT, IITA, IPRI, and IRRI) two national institutions from developing countries (Chinese Academy of Agricultural Sciences and EMBRAPA, Brazil) and four institutions from developed countries (Cornell University, USA, John Innes Centre, UK; National Institute of Agrobiological Sciences, Japan; Wageningen University, Netherlands). A Programme Steering Committee (PSC) serves as a Board of Directors and is comprised of the Chief Executive Officers, or their designees, of the Challenge Programme consortium members with additional representation from GFAR and the CGIAR Executive Council (the latter in an *ex-officio* role). Mr. Ismail Serageldin serves as the independent Chairman of the PSC. The PSC will receive independent advice from a Programme Advisory Committee (PAC) and a Stakeholders Committee convened by GFAR. Both the PAC and the Stakeholders Committee are currently being recruited.

Financial Support: US\$ 3 million from the World bank and Eu 4.15 million from the European Union were pledged for the first year pending submission of a satisfactory work plan. Consortium members pledged to provide US\$ 400,000 in-kind each annually in support of the Challenge Programme. The Programme was provisionally endorsed by the Executive Committee of the CGIAR in May, 2003 and received formal approval the following July.

¹ *Musa* is a special case, in that as a monocot it has commonalities with the cereals and as a vegetatively propagated large accumulator of carbohydrate it has commonalities with the root and tuber crops. Thus different issues concerning *Musa* will be addressed within both crop groups.

Table 1. Generation Challenge Programme 2003 Revenue from Grants

Source	Cy	Amt Paid	Exch Rate	US\$	% OH	Total OH	Operating Budget
WB	USD	3,000,000	1.0000	3,000,000	4	120,000	2,880,000
EC	EUR	4,150,000	0.79428	5,224,850	4	208,994	5,015,856
Austria	EUR	45,000	0.8260	54,482	0	0	54,482
Sweden/SIDA	SEK	800,000	7.4757	107,013	0	0	107,013
Total				8,386,345		328,994	8,057,351

Progress Since Provisional Approval by the CGIAR

Research Activities

The Challenge Programme was provisionally approved by the CGIAR in July 2003. A Technical Planning Workshop was convened 25-29 August 2003 in Wageningen, The Netherlands, with more than 40 Challenge Programme member scientists participating. While recognizing the wishes of the stakeholders that all 22 CGIAR mandated crops benefit from the Challenge Programme research, for practical reasons the group decided that the highest priority, or Phase 1, crops to be addressed in the first years will be **wheat, barley, sorghum, maize, rice, cowpea, common bean, chickpea, cassava, potato, and Musa**. Since there was no time to develop an orderly competitive grants programme (anticipated to receive approximately half of the research funds over the life of the Programme) it was decided that the first year's research would consist wholly of commissioned research.

The highest priority research areas were identified and grouped into clusters under each Subprogramme. Notional budgets were assigned to each subprogramme cluster and a target of mid-October was set for completion of the work plans for each cluster. Plans were to include: 1) objectives; 2) approaches; 3) activities; 4) deliverable products; 5) partners; 6) budget per partner. Draft plans were sent to a panel of expert external reviewers and revised as per their comments. The final workplan was completed in November and delivered to the World Bank and the EU. The plan was deemed satisfactory by both donor organizations.

The full workplan, details on the activities, the expected outputs, and budgets can be found at the Challenge Programme Website: www.generationcp.org. The budget breakdown by Subprogramme and research cluster is here:

Table 2. Agreed resource allocation across Subprogrammes for Year 1

SUBPROGRAMME	BUDGET
Subprogramme 1: Genetic Diversity of Global Genetic Resources	\$2,800,000
Subprogramme 2: Comparative Genomics for Gene Discovery	\$1,130,000
Subprogramme 3: Gene Transfer and Crop Improvement	\$600,000
Subprogramme 4: Bioinformatics	\$2,100,000
Total	\$6,630,000

Table 3. Subprogramme 1: Genetic Diversity of Global Genetic Resources

Research cluster	Budget
CL1: Composite Genotype Sets	\$400,000
CL2: Collection of Marker Sets/Genotyping/Data Analysis	\$2,000,000
CL3: Phenotyping Protocols Workshop	\$100,000
CL4: Intellectual Property/Access and Benefit-Sharing (Policy Research)	\$200,000
Subprogramme Leader research support	\$100,000*
Total	\$2,800,000

Table 4. Subprogramme 2: Comparative Genomics for Gene Discovery

Research cluster	Budget
CL1: Germplasm Evaluation	\$300,000
CL2: Marker Development	\$290,000
CL3: Gene Expression Profiling	\$280,000
CL4: QTL Analysis	\$160,000
Subprogramme Leader research support	\$100,000*
Total	\$1,130,000

Table 5. Subprogramme 3: Gene Transfer and Crop Improvement

Research cluster	Budget
CL1: Marker Assisted Selection (MAS) Training Workshop	\$50,000
CL2: MAS Across Crop Groups	\$350,000
CL3: Crops With Appropriate Gene Technologies (Transformation Across Crop Groups)	\$50,000
CL4: Recurrent Parents	\$50,000
Subprogramme Leader research	\$100,000*
Total	\$600,000

Table 6. Subprogramme 4: Bioinformatics

Research cluster	Budget
CL1: Expert Networks	\$1,000,000
CL2: Genetic Resources, Crop, and Genomics Analysis and Information Systems	\$1,000,000
Subprogramme Leader research support	\$100,000*
Total	\$2,100,000

** \$100,000 reflects additional operating funds to support Subprogramme Leader in research activities of his/her respective Subprogramme.*

Two Subprogrammes held progress and planning meetings at the Plant and Animal Genome (PAG) meeting in San Diego in January of this year. The summaries of the outputs of these meetings are on our Website (<http://www.generationcp.org/genesforcrops-calendar.htm>).

The First Year Workplan and Budget was developed and distributed in early December 2003 and contracts with the member institutes were sent out in January 2004. The approved research projects for the first year are already underway and funds have been disbursed to the cooperators.

Harmonization of Cross-Programmeme Methodologies and Platforms

The Programme is vigorously creating the platform technologies in informatics, communications, comparative biology, and capacity building required to implement its global programmes.

The first major GCP meeting focused on bioinformatics needs for the first and following years. Held at IPGRI in Rome, Italy, 16-20 February, delegates from all of the GCP member institutes discussed white papers that had been developed prior to the meeting. The discussions identified major areas where new or improved platforms, ontologies, and/or infrastructure were needed to support the activities of (primarily) SP1 and SP2. While there is considerable expertise in bioinformatics in the Consortium, especially in Cornell, JIC, NIAS, WAU, and IRRI, delegates to the SP4 meeting discussed tapping external resources as well. This is an area where collaboration with the private sector early on in the Programme may be the most feasible.

Other mechanisms for developing our standard cross-programme approaches include:

- Crops with Appropriate Gene Technologies (SP3): 26-30 April in Nairobi, Kenya
- SP1 and SP2 Data Analysis methodologies: 21-25 June 2004 in Zaragoza, Spain
- Inter-Challenge Programme Intellectual Property Training and Dialog: 28-30 June in Rome, Italy
- Phenotyping Protocol Development: 5-9 July in Montpellier, France
- Needs Assessment Workshop for NARS: 2-6 August in Santo Domingo de Hereria, Costa Rica
- GCP Annual Research Meeting: 22-24 September in Brisbane, Australia
- Marker-Assisted Selection: dates and location TBD
- Intellectual Property Policies and Issues: dates and location TBD

Competitive Grants Programme

The original GCP document states that up to 50% of research funds will be awarded through a competitive process. We are targeting 50% for the first year. A call for proposals was developed in consultation with the Consortium members and the programme management team (Appendix 3). It involves a two step process of a pre-proposal followed by a full proposal, if the external peer review panel recommends that a pre-proposal move forward for development. Clear expectations are spelled out based on the programme areas within the GCP and the criteria and weights for evaluation are specified. An internationally respected set of scientists has been approached to serve as peer reviewers. As of 22 April all of those who responded (10 out of 15) accepted this important and heavy responsibility. This degree of positive response is unusual and reflects how well this Challenge Programme is already viewed within the community.

Commissioned Research

Approximately 50% of the available research funds will be distributed as commissioned research grants. There will be three types of such grants. One will be for essential work in areas that do not lend themselves to a competitive research grants process. An example would be further characterization of diversity within germplasm banks. A second form will be to fill gaps left by the competitive programme. Since we cannot be sure if all of the areas we have set forth in our programme document will be adequately addressed by the competitive process, we reserve some funds for “gap filling.” A third important area for commissioning research is capacity building. The management team will determine the specifics of all three areas and request bids. As in the competitive grants programme, final approval of the awardees will be by the PSC.

Capacity Building

During this first year a large number of capacity building activities are being conducted. Most of these are built into the research plans and are detailed in the workplan. Three capacity building workshops are scheduled: Crops with Appropriate Gene Technologies; Marker Assisted Selection; and Intellectual Property Issues and Policies. In addition 10-12 NARS centres of excellence selected to serve as hubs for training and capacity building activities to address the needs identified in all regions. At least twenty NARS (users) representing all our target regions and crops will participate in a needs assessment exercise in the relevant areas of the different subprogrammes (genetic diversity analysis with molecular data, comparative genetics and genomics, gene transfer and crop improvement, and crop information systems).

Governance and Management

Programme Steering Committee. The first PSC meeting was held in Wageningen on September 1 – 2. The outcomes of the planning meeting were endorsed and the process for finalizing the workplan was approved. The PSC clarified its role in Programme oversight and set forth clear expectations for the Director. It also approved the internationally competitive recruitment process for selecting the Challenge Programme Director. Meeting minutes are available on request from R. Zeigler.

Programme Management Team. After a rigorous search, Dr. Robert Zeigler, Head of the Department of Plant Pathology and Director of the Plant Biotechnology Center at Kansas State University was selected as Challenge Programme Director. He officially assumed the position on December 15, 2003, but participated in AGM, making a presentation at the Stakeholders session.

A transparent competitive process, approved by the PSC, was developed for the selection of the Subprogramme Leaders. The highly accomplished and internationally respected scientists selected are:

- SP1: Jean-Christophe Glaszmann, Agropolis
- SP2: Hei Leung, IRRI
- SP3: Jonathan Crouch, ICRISAT
- SP4: Theo van Hintum, Wageningen
- Capacity-building coordinator (SP5): Carmen de Vicente, IPGRI

The Director, the Subprogramme Leaders, and the Capacity-Building Coordinator constitute the Challenge Programme management team. The details of the selection process and their responsibilities are available on request. The Subprogramme Leaders and Zeigler met in Rome on February 15 (prior to Dr. de Vicente's appointment) and all participated in the SP4 meeting.

Adriana Santiago has been engaged as full time financial administrator and Griselda Marquez is half time administrative assistant for the Challenge Programme. Both represent part of CIMMYT's in-kind contribution to the Programme. Jennifer Nelson has been contracted as a Communications Assistant.

Stakeholders' Committee. The EU has agreed to provide additional resources for the first year to support establishment of a Stakeholders' Committee that will provide input into the Programme's directions and priorities. This committee will be coordinated and managed by GFAR. Zeigler and Ola Smith of GFAR met to discuss the details of the Committee's operations and composition on 18 February at FAO.

Dr. Smith communicated the EU's willingness to support operations of the Stakeholders Committee adequately to allow participation of approximately 14 members. Proposed membership will include one representative each from the GFAR Regional Fora, two representatives each from the NGO Committee, Farmers' Group, and the Private Sector Committee, one Donor Representative from North America and one from Europe (either EU/EIARD or IFAD), and two from GFAR. Zeigler will serve as an *Ex Officio* member.

The members of the Stakeholders Committee will be selected from a group nominated by the respective member groups. Each group will be asked to submit full CVs of 3 times the number of representatives projected from the committee (e.g. the Private Sector Committee should submit six CVs). GFAR and the CP Director will review the candidates and reach agreement on the most suitable individuals. We will seek a Stakeholders Committee with experience in genetic resources issues, crop improvement, international development issues, and public-private sector interface. The Committee is targeted for final constitution by July.

Dr. Smith suggests that the Committee meet with a subset of the PSC just prior to the next PSC meeting (tentatively scheduled for early October), observe the PSC meeting, then have a one day meeting immediately following the PSC meeting to establish its annual work plan. Zeigler and Smith agreed that once the Committee is constituted that mechanisms should be in place to insure a clear flow of information between it and the research activities of the CP.

Monitoring and evaluation. The Director's office provides quarterly and annual progress reports to the Programme Steering Committee, the CGIAR, and stakeholders. The reports include information on: research outputs relative to planned activities and deliverables; governance and management structure and activities; resource mobilization; partnership development; and communication/public awareness. Discussions have been initiated with the CGIAR Institutional Learning project personnel (hosted at IPGRI) to work jointly to develop a proposal to establish an on-going monitoring process for the Challenge Programme. This will complement and feed into the Stakeholders Committee.

External reviews. Three external reviews are planned for the GCP near the completion of its first year by the EU, the World Bank, and the Executive Council. Philippe Vialatte of the EU is working with the World Bank and ExCo to develop a coordinated assessment of the GCP.

Developing a Capacity-Building Strategy

We aim to develop a programme for capacity building in national programmes that will empower a range of national agricultural research programmes to actively participate in the Challenge Programme research programme and carry this expertise beyond the life and scope of the Challenge Programme. These scientists will also comprise a local and highly competent resource to contribute to formulation of national policies on the application of modern plant biology to crop improvement in their countries.

One dimension of our capacity building strategy will be to require a clear and rigorous capacity building component within each competitive grant. This is to be included as an explicit and weighted aspect of the evaluation criteria.

A second dimension will be to develop targeted courses conducted in different regions. The strategy for this will be developed based on inputs from a needs assessment workshop to be held in Costa Rica in August. Representatives from a set of developing countries at varying levels of capacities will be consulted. Cornell University Center for Genomics Research will assist in this workshop and based on its outputs will begin the development of a web-based and CD ROM "help Desk". The outputs of the workshop will be used as input to the Stakeholders Committee as we seek their counsel on our training strategy. We have initiated contacts with NEPAD, ILRI, African Biosciences and HarvestPlus to explore the possibilities of establishing an East and Southern Africa Training Centre for the Challenge Programme in Nairobi. Such a centre would be a natural home for regional courses and for scientists to obtain medium-term hands-on research experience.

A third dimension of our capacity building programme will be to provide national scientists participating in CP projects the opportunity to participate in the international meetings with which CP events are associated.

The precise aspect that these different dimensions acquire will depend upon the outcomes of the Needs Assessment Workshop in August.

Meetings with Stakeholders and Donors

In February, Zeigler met with representatives from the French Ministry of Youth, Education and Research in Paris and briefed them on progress in the CP. Also in attendance at the briefing were representatives from the Ministry of Foreign Affairs, Agropolis, IRD, and Genoplante. They expressed strong support for the Programme and highlighted the importance of communications of the Programme's objectives and activities in light of the difficult political environment surrounding plant biotechnology and genetics. They have initiated a process to obtain an additional E3-4 million for 3-4 years from the French government for the CP. This will be for the competitive grants programme and capacity-building. If all goes well, these funds should be available beginning in 2005. In Brussels, Zeigler also met with the European Commission EIARD working group assigned to this CP. It is chaired by Gerasimos Apostolatos and was attended by the chairman, Philippe Vialatte, Paul Harding, Dirk Potier, Yves Savidan, Emile Frison, and Cristoforo Corda. It was a very positive interaction, and there was general agreement that indeed we are all on the same team. With respect to three separate first year reviews that have been discussed (EC, World Bank, and ExCo) Philippe Vialatte offered to approach the WB and ExCo to try to develop one coordinated assessment around June or July. Minutes of the meeting are available from Zeigler on request.

In April, Zeigler met with ACIAR, CSIRO Division of plant Industry, the University of Adelaide, and the Australian Grains Research and Development Corporation in Canberra to discuss various options for Australia joining the GCP both as a Consortium member and as a donor. These were very fruitful discussions leaving us in a "how" rather than an "if" frame of mind.

The US Department of State and USAID have been approached and very positive discussions were held in April in Washington DC. Some interesting possibilities for seeking significant funding for the Programme were discussed and are in the very early planning stages.

Resource Mobilization

We realize that for donors to be willing to join in supporting the Generation CP, there must be solid evidence that the Challenge Programme is a viable entity. This must be demonstrated by having a vibrant research component underway, a clear work plan, transparent governance, and a visible management structure. That is, we must be seen to be a good investment. Thus, we have taken the strategic decision to get these essential foundations in place before we make an aggressive approach to donors. Nonetheless, we have made some efforts at resource mobilization.

Following discussions between Zeigler, Emmy Simmons, Rob Bertram, and Larry Beach at USAID it was agreed that the USAID-supported Cereals Comparative Genomics Initiative (www.cerealsgenomics.org) (funded at US\$1 million in 2004) will form part of USAID's contribution to the Challenge Programme. These funds are dispersed as competitive grants and each grant includes a consortium member of the Challenge Programme. Sweden has contributed approximately US\$ 100,000 and Austria has contributed US\$ 54,000, bringing total liquid funds available for the Challenge Programme to over US \$9.3 million for 2004. Each Consortium member has been requested to provide a detailed accounting of their US\$ 400,000 in-kind or cash contribution to the Programme utilizing a standard reporting format developed by the

Director's office (Appendix 1). These contributions are equivalent to an additional US\$ 5.6 million of support. The six non-CGIAR institutions contributions represent completely new funds and intellectual resources to the Programme, as does the contribution from USAID.

Contacts have been made with a number of potential donors ranging from traditional sources, such as ACIAR to far less conventional sources such as the US National Science Foundation. The latter represents a means for the CGIAR to access funds that previously were not available. For example, NSF has announced two international programmes that are ideally suited to the Generation Challenge Programme. There is now a proposal under preparation with Cold Springs Harbor Laboratory and Cornell University for the Challenge Programme to the US National Science Foundation's International Computational Networking Programme. This will seek support for the development of our main global computational and data management infrastructure. Such a proposal would not be possible without the existence of this Challenge Programme.

Partnership Development

Dr. Iwanaga and Peter Ninnes had a half day meeting with members of Private Sector Committee at CGIAR Secretariat in September including Sam Dryden (Chair of PSC) and Bill Neibur. They also met with Dr. Bouis to begin discussing linkages with the HarvestPlus CP.

Dr. Zeigler established contact with the Private Sector regarding opportunities for partnering in March 2004. We have also made contacts with outside research institutes and scientists who are eager to participate in the Challenge Programme. These include: The African Centre for Gene Technologies and affiliated institutes, and the University of Cape Town in South Africa; and the African Agricultural Technology Foundation (AATF), Nairobi. Further discussion will take place between HarvestPlus and the Challenge Programme on the possibility of mounting a joint venture in the African Biosciences facility at ILRI. Discussions have been initiated with Peter Langridge, Director of the Australian Centre for Plant Functional Genomics, on how to form research linkages and leverage Australian support for the Challenge Programme. The Scottish Crop Research Institute has expressed an interest in participating in the bioinformatics component of the Programme. Zeigler participated in the Cassava Biotechnology Network research meeting to be held in Cali, Colombia, in March, 2004.

Zeigler and Jonathan Crouch visited with NEPAD, ILRI, the Rockefeller Foundation and the African Agricultural Technology Foundation in Nairobi in late April. The results of these meetings could not be included in this report.

There are obvious commonalities between the research agendas of the two other Challenge Programmes: Water for Food and HarvestPlus. The three Directors have agreed in principle to try to harmonize their research programmes, competitive grants programme procedures, and IP policies, as possible. Zeigler and Joe Tohme, biotechnology coordinator for HarvestPlus participated in the Food and Water Steering Committee meeting in March in Brazil. The three Programmes will jointly hold an Intellectual Property workshop for their senior managers in June, convened by IPGRI.

A number of recent developments in the plant genomics community would not have occurred without the Generation Challenge Programme. As mentioned earlier, an innovative new bioinformatics partnership between Computational Sciences Directorate, Cold Springs Harbor Laboratories, NCGR, and Cornell University was catalyzed by the GCP. The Generation Challenge Programme has been invited to join in the Plant Ontology Consortium, a highly influential international body that sets bioinformatics standards for plant genomics data management worldwide.

New partnerships that GCP is cultivating are intended to: a) expand the breadth of the programme, b) bring additional intellectual capital into the fold, and c) attract new donors through non-traditional partnerships.

Table 7: Summary of Dr. Zeigler's visits and contact with donors and stakeholders:

Who	Where	When
Bill Niebur, Private Sector Committee	Washington DC	January 2004
Senator Brownback	Washington DC	January 2004
Genoplante	Paris, France	February 2004
GFAR	Rome, Italy	February, 2004
Agropolis IRD	Montpellier, France	February, 2004
Ministry of Youth, Education and Research in Paris; the Ministry of Foreign Affairs;	Paris, France	February 2004
DG DEV, DG AIDCO & DG Research	Brussels	February 2004
EIARD Task Force plus the European members of the CP Consortium	Brussels	February 2004
Cassava Biotech Networks/ CIAT	Cali, Colombia	March 2004
Maize Genetics Conference	Mexico DF, Mexico	March 2004
Embrapa	Brazil	March 2004
IRRI	Philippines	April 2004
University of Adelaide/Australian Plant Functional Genomics Centre	Adelaide, Australia	April, 2004
ACIAR, GRDC, CSIRO, CAMBIA	Canberra, Australia	April 2004
USAID	Washington DC	April 2004
US Department of State	Washington DC	

Technology Delivery

We recognize that to have the desired positive impact on the lives of resource-poor farmers, we will need to have an effective technology delivery programme. However, attempts to reach these farmers in the past have, almost by definition, failed. We are therefore considering how to develop delivery programmes well in advance of having actual products. The HarvestPlus CP is faced with an almost identical challenge. Indeed, compared to the Generation CP they are working with many of the same crops, in the same countries and with the same NARS and CGIAR collaborators. We have decided to join with HarvestPlus in developing a delivery strategy. The first step in this process will be to participate in a brainstorming session with HarvestPlus to frame the issues and develop approaches.

A parallel effort will be launched with the support of the McKnight Foundation. We know that there are many crop improvement networks around the world dating from the 1970s that today are in various stages of activity. To be sure, the people who were trained in these networks are to a large extent still working in the field. We believe there is an opportunity to build upon this human resource to create a new generation of product delivery. However, we first wish to assess what the strengths and weaknesses of these networks were. Since most of these networks have been reviewed multiple times over their lives, we will conduct a meta analysis of the networks. Based on the outcome of this analysis (funded by McKnight Foundation) we will develop a new model of delivery. We expect that this will cross commodities and be at least regional in scope. This proposal combined with the efforts with HarvestPlus should yield a delivery mechanism suited to the needs of the target populations.

Communications and Public Awareness

Jennifer Nelson was hired as Challenge Programme Communications Assistant and has developed with Zeigler a draft communications and public awareness strategy. Distinct target audiences have been identified and include: the donor community; the scientific community; stakeholders in developing countries; and the general public. Each will require different modes of communication.

Following extensive consultation a new name and logo were adopted that give an identity to the Programme free from preconceptions associated with genetic engineering. We have launched a monthly e-newsletter that reaches over 300 people, inside and outside the Consortium.

Establishing our identity within the scientific community is well under way. Zeigler Chaired a Challenge Programme session at the Plant and Animal Genome (PAG) Conference on 12 January. Over 300 people attended. The session introduced the Challenge Programme and six scientists presented on topics ranging from finger millet improvement to establishing an interactive resource centre for global comparative genomics initiatives. Following the PAG conference, Zeigler was interviewed by Genome Technology magazine, and the Challenge Programme will be featured in the March/April issue. The Programme also made presentations at the annual Maize Genetics meeting to be held in March in Mexico City, and the Linkage Disequilibrium Conference held in Adelaide, Australia.

The GCP is scheduled to present at the Rockefeller Foundation Drought Conference to be held in Cuernavaca in June 2004 (H. Leung and R. Zeigler). Sessions on the Challenge Programme are

being planned for Eucarpia17 in Austria in September (Theo van Hintum, and J.-C. Glaszmann), the International Crop Science Congress in Brisbane also in September, and the “Rice is Life” Symposium in Tskuba in November (H. Leung). Zeigler will present the Challenge Programme at the plenary session of the American Phytopathological Society in August in Anaheim, California.

We have established an information-rich Web Site (www.generationcp.org) and recently launched a ‘virtual workspace’ for CP members (<http://cpvws.grinfo.net>). A brochure has been developed and is available for viewing or downloading at our website. We have contracted with Maxstudio Design in Rome to “put a human face” on our Web site and communications documents. The new Website, brochures, posters and associated materials will be available by the end of June.

In terms of media coverage, the Programme was featured in an article in Genome Technology magazine and received prominent mention in the CropBiotech Web Newsletter. An article on the GCP will appear in the next CGIAR Newsletter. Contact has been made with the Crawford Foundation to have an aggressive media programme for our launch in Brisbane, Australia during the International Crop Sciences Congress.

Lessons Learned (in addition to the lessons presented by Masa Iwanaga at AGM 2003...see Year 1 Work Plan)

The Challenge Programmes represent a major departure from the traditional ways of operating with the CGIAR, and as such, the first year so far has been a constant process of learning and adjusting. The short time frame within which the GCP had to finalize its workplan and initiate research required from each consortium member a certain amount of flexibility, tenacity, and diplomacy as we maneuvered through uncharted territory.

Among the lessons we have learned in this first year are that the Challenge Programme must interact with the different consortium institutes differently, particularly those outside the CGIAR. To many institutes, the CGIAR is a foreign entity, and its “rules of engagement” are not well-understood. The variability in IP perspectives and policies across institutes has compounded this. Some of our initial interactions with non-CG institutions have been negatively affected by the fact that the CGIAR is poorly viewed in some quarters, particularly where partnerships will be needed in the future. Capacity building for CGIAR and ARI scientists, we have learned, is just as critical as capacity building for NARS, with different degrees and kinds of training required for each. We underestimated the complexity of negotiating and finalizing workplans via electronic communications, and impressed upon us the need for an orderly process for both competitive and commissioned research.

As pointed out by the Private Sector Committee, the governance of the Challenge Programme remains cumbersome, primarily because of the large size of the Program Steering Committee. The issue of product delivery, while not specified in the proposal documents, will be critical for impact, so we have begun to explore options for delivery even at this early stage. Related to that, the GCP must be vigilant about countering the outside impression that we are a basic science programme, a solution-in-search-of-a-problem outfit. We also must be conscious of the tendency

to perceive our main product as being GM crops, while in fact GM technology is only one of many tools at our disposal.

Some of the surprising developments of this first year are how positively the scientific community has reacted to the Challenge Programme and how the GCP's innovative structure and scientific workplan has seemed to capture the imagination of non-traditional donors. Opportunities for funding not typically available to the CGIAR are open to the Challenge Programme, if we partner with the proper institutions.

Further Response To Concerns Raised During the Challenge Programme Approval Process (complementing the thorough responses provided by Dr. Iwanaga earlier)

Clear Definition of Outputs

The development of our first year workplan has been a major step in providing more detail to our expected outputs. During the coming year the Programme Management Team will continue to develop more specificity. This growing clarity will most certainly attract additional partners and donors.

Intellectual Property Management

For the Challenge Programme to have a plan to manage intellectual property, we must first know what is being brought to the programme by our partners. Further, we must know which of that property was developed by the partner and which may be third party IP or otherwise encumbered. Thus we have developed a standard IP inventory form based on a model developed by IIRRI to satisfy much the same need (Appendix 2). This form has been distributed to all members and the results will form the basis for creating an IP registry for the Programme. This registry will include all pre-existing IP as well as serving as a repository of record for IP generated by partners in the Programme as part of their Programme activities. IIRRI will develop a computer-based registry that will allow all partners to conveniently record and monitor their IP commitments.

The CP has contracted a patent, trademark and copyright attorney to assist us in developing both an annual collaborative agreement and the platform CP agreement that will set forth the operating principles of the CP. The latter document specifies how intellectual property will be managed. Included in this is a provision that will allow a Consortium member to enter into a bilateral or multilateral agreement with a private sector entity. The products of such collaboration will contribute to the outputs of the CP while respecting the confidentiality and other requirements that such an agreement might impose.

An IP workshop at IPGRI has been scheduled for last week of June among the three Challenge Programmes to develop a common strategy to manage IP. We will use our registry as a departure point for planning the details of the workshop. The private sector should be rich source of experience and advice on how to (and not to) manage IP issues.

Transaction Costs

The CGIAR has become known for creating cumbersome, top-heavy mechanisms in response to calls for change in its manner of doing business. Thus donors and stakeholders are rightfully concerned that the Challenge Programmes will place yet another layer of transaction costs on the system's scientists and further reduce their ability to undertake productive research. This Challenge Programme is mindful of this concern, yet recognizes that if scientists from different institutions are to forge new and productive relationships, they must be able to meet and communicate. To balance concerns with needs we are taking the following steps to reduce the transactions costs

- 1) *Research meetings scheduled to add value to the participants.* For example, two Subprogrammes scheduled meetings during the plant and Animal Genome meeting in San Diego, California last January. No additional travel time or costs were incurred by those already attending PAG, and those few who were not normally going to attend had the enriching experience of PAG while fulfilling their GCP obligations. That philosophy and approach will govern the scheduling of as many meetings as possible. The 2004 annual research meeting of the Challenge Programme is now considered to be an official satellite meeting of the International Crop Science Congress, for the same reason. To further save on travel time and have full buy-in from our stakeholders, we are proposing that the Stakeholder Committee participate in our annual research meetings.
- 2) *Scrutinize composition of workshops, training courses and planning meetings.* It is already apparent that many of the same people will attend multiple functions. Where there are obvious savings in travel time and expense, we will organize meetings back to back.
- 3) *Full use of electronic means for communications.* We are developing an information rich website that will have modules to allow sub-programmes to engage in virtual meetings, as well as post information. We are exploring the use of advanced and secure web-based communications packages that avoid the many constraints of e-mail. Video conferencing should play an increasing role as the programme develops. At the very least, we expect that the Subprogramme Leaders will participate in PSC meetings via video conference rather than travel to the meetings. A target is to provide the possibility for projects within the Subprogrammes to have regular video conference lab meetings.
- 4) *Standardized reporting formats.* As in the reporting of Consortium member cash and in-kind contributions and the development of the IP Registry, we will develop common templates for reporting and monitoring activities in the Programme.

Drought Versus Other Traits

The Programme will address other more tractable problems in the early years as well as maintain a longer term vision on drought tolerance. Likely targets are biotic stresses (e.g. *Striga* resistance, the rice/wheat/blast complex that may be a serious threat to global wheat production and lends itself to a comparative genomics approach) and abiotic stresses (cold, aluminum, and salt tolerance). Certainly there will be spill over from some of the other abiotic stress studies that will benefit research on drought tolerance.

Links with Private Sector

This is an area that has great potential, yet carries some risk, as well. The Programme stands to benefit mightily from the vast stores of knowledge generated by private sector companies that have worked for years and invested many millions of dollars in the very areas that the Programme seeks to work. There are two challenges that must be met to make these resources available:

- 1) The companies that participate must not risk their access and legitimate claims to lucrative markets.
- 2) Participating companies should not be expected to release information that would provide an advantage to one or more of their competitors.

To deal with these challenges it will be essential to clearly identify what inputs are required or desired from the private sector, and from whom in the private sector, more precisely. It will also be important to clearly, explicitly, and transparently identify and describe the terms of our relationship. One of the strengths of the Programme is that it is a new public platform to bring the products of biotechnology to resource-poor farmers and consumers. There are those who would love to tarnish our image and remove us from the moral high ground by painting us as pawns of multinationals. The manner in which we develop our partnerships must *ex ante* defuse any such potential attacks.

APPENDIX 1

Challenge Programme: Unlocking Genetic Diversity in Crops for the Resource Poor

In-Kind Contributions from Consortium Members

During the Stakeholders Meeting in Alexandria the proposition was accepted that Consortium members would make real contributions of US\$ 400,000 per year to the Challenge Programme. During the Programme Steering Committee in Wageningen this was discussed and several members indicated that in-kind contributions by some members could exceed their cash contributions. The following table is intended to assist Consortium members in documenting their contributions to the CP.

Institution:

Year: 2004

Personnel Contributions						
Personnel	Name	Title or Position	% time committed to CP ¹	Sub-Programme	US\$ Value ¹	Source of funds ²
IRS						
Total						
National Staff						
Total						
Personnel Total						

Operational Support					
	Purpose/destination (very brief)	% committed to CP	Sub- Programm e	US\$ Value	Source of Funds
Supplies and services					
Travel					
Capital Equipment ³					
Director Travel to PSC				\$5000 ⁴	
Total Operational support					
Grand Total					

¹If an institution has a budget formula for assigning a monetary value for IRS staff time that accounts for the IRS “support pyramid”, then this may be used to calculate the contribution to the CP. However, if this formula is used no additional support funds should be included.

²Specify whether core, restricted core or project funds. For restricted core or project funds specify the project title, total annual project budget and donor (s).

³Do not include vehicles. Equipment newly purchased specifically (though not exclusively) for CP activities may be included, prorated for CP use and depreciated over the unit’s expected life.

⁴Estimated restricted business class travel to Wageningen, local travel, 3 nights’ hotel and per diem.

APPENDIX 2

Development of the Intellectual Property Registry Related to the Challenge Programme: Unlocking Genetic Diversity in Crops for the Resource Poor

I. Introduction

In the Challenge Programme business plan approved by the Executive Committee of the CGIAR it was stipulated that we would maintain a registry of intellectual property (IP) that was brought to the CP by its members and their partners. Likewise we will maintain a record of IP that is generated by the CP as well as its relationship to the pre-existing IP.

To satisfy this first requirement, Consortium Members are hereby requested to identify the status of their pre-existing intellectual property created by the member (“Own IP”) and any third party intellectual property (“Third Party IP”) that will be used in undertaking the work funded by The Challenge Programme: Unlocking Genetic Diversity in Crops for the Resource Poor (“the Programme”). Third Party IP refers to any tangible or intangible property owned by others that will be used in conducting the Programme’s research.

We realize that it can be difficult to identify each and every Own and Third party IP that may be utilized in conducting research under the Programme. Therefore, we are mainly seeking to identify the primary inputs that could possibly impact the Programme’s ability to make the research results freely available everywhere or, alternatively, affect the Programme’s ability to seek IP protection for some aspects of the research results.

With the above in mind, we are asking that each institution provide the information requested in the table provided in Section II for any of their own and third party inputs pertinent to their research funded by the Programme. Explanatory descriptions of some of the terms and phrases used in the table are provided in Section III. In Section IV we provide a sample completed table as an example of how we would like to have the table completed.

This is a one time exercise and we have tried to make this as straightforward, clear and convenient as possible. Having an accurate and complete record of pre-existing IP will be of enormous importance when it comes time for products of the CP to move to farmers’ fields.

We are especially grateful to IRRI for generously providing the template that they developed in response to a similar request from the Food and Water CP. Hopefully, if all CPs use the same or very similar formats the charge of developing an IP registry will be much less of a burden to all participants.

II. Tables of Own and Third Party IP to be Used in the Programme

Description of Own IP – <u>what is it?</u>	Source of Own IP – <u>If developed elsewhere</u>	Owner of Own IP – <u>who owns it? Does institution share with discoverer?</u>	IP Rights <u>What kind of IP rights does the owner expect to exert?</u>	Status of Own IP Rights – <u>Do you have a legal and unrestricted right to use it?</u>
Tangible Property – “Things”				
Methods of Doing Something				
Written Text and Computer Code				

Description of Third Party IP – what is it?	Source of Third Party IP – where did it come from?	Owner of Third Party IP – who’s owns it?	IP Rights Owned by Third Party – what kind of IP rights does the owner have?	Status of Third Party IP Rights – do you have a legal right to use it?
Tangible Property – “Things”				
Methods of Doing Something				
Written Text and Computer Code				

III. Explanatory Descriptions of Some Terms and Phrases Used in the Table

Description of Third Party IP. Please provide a written description/explanation of the Third Party IP under the appropriate category provided in the table. Below, we provide summaries and examples of the three major types of Third Party IP. See Section IV for a sample completed table.

Tangible Property – “Things” includes but is not limited to the following:

Plants and animals (e.g., genotypes, varieties, strains, segregating populations, inbreds, hybrids, clones).

Microorganisms (e.g., bacteria, yeast, viruses, fungi).

Equipment (e.g., mass spectrometers, gene sequencers, chromatography, global positioning/geospatial apparatus, DNA chips, apparatus for catching fish, apparatus for sampling water).

Nucleic acids (e.g., DNA, RNA, genetic constructs; vectors; isolated genes; promoters; Expressed Sequence Tags (ESTs), primers, tags).

Proteins (e.g., antibodies, isolated enzymes, genetically modified enzymes).

Chemicals (e.g., reagents, fungicides, insecticides, buffers).

Methods of Doing Something includes but is not limited to the following:

Genetic transformation/genetic engineering/gene introduction (e.g., Whiskers®, biolistics/gene gun/microprojectile bombardment, agrobacterium-mediated transformation).

Assays (e.g., polymerase chain reaction (“PCR”); isolation and quantification of nucleic acids (RNA, DNA) and amino acids (proteins, peptides, polypeptides); methods of assaying for the presence of chemicals).

Marker-assisted selection.

Any other method of accomplishing a task.

Written Text and Computer Code includes but is not limited to the following:

Algorithms.

Computer code/programmes.

Data sets (e.g., geospatial data, rainfall data, temperature data).

Nucleic acid sequences.

Source of Third Party IP. Please provide the best information you have about where and from whom you obtained the Third Party IP. See Section IV for a sample completed table.

Owner of the Third Party IP. Please provide the best information you have about who actually owns the Third Party IP. The owner may be different than the person/entity from whom you received the Third Party IP. See Section IV for a sample completed table.

IP Rights Owned by Third Party. Please provide the best information you have about what kind of IP rights are possessed by the owner. Examples of the most commonly used types of IP rights include the following:

Patents and Patent Applications – e.g., utility/regular patents, provisional patent applications, Plant Patents, Design Patents, International Patent Applications filed under the Patent Cooperation Treaty (“a PCT application”).

Plant Breeder’s Rights/Plant Breeders Certificates and applications therefore – patent-like rights to plant varieties under UPOV.

Sui Generis Protection – national, unconventional legal protections for plant varieties.

Trademarks and Service Marks and applications therefore – e.g., new products/services, packaging/advertising materials, advertising slogans, icons, logos, graphics, building designs, domain names.

Trade Secrets – confidential information held by a Third Party. Defined as items not generally known or ascertainable by proper means, having economic value and the subject of reasonable precautions for the secrecy thereof. Examples include software, customer lists, employee knowledge, production processes and survey/research data.

Copyrights and Copyright Applications – e.g., writings, pictures, computer programmes, data sets.

None or Unknown.

Status of Third Party IP Rights. Please explain whether and how you obtained the rights to use the Third Party IP. Examples of ways that such rights can be obtained include but are not limited to the following:

Licenses – a contract which allows the licensee (the one obtaining the license) to use the Third Party IP. Please include important conditions in a license such as but not limited to the following:

Whether the license is exclusive or non-exclusive;

Whether the license is worldwide or, alternatively, limited to specific geographic areas, such as being limited to specific territories (e.g., “Africa”) or nations (e.g., “the United States”); and

Whether the license is limited to specific uses or applications (e.g., “only for non-commercial purposes”, “only for the transformation of Zea Mays”) – these types of conditions are often called “field of use restrictions”.

Material Transfer Agreements (“MTA”) – where the transfer of material to you from the Third Party included certain restrictions or conditions for its use (e.g., “can only be used in accordance with FAO guidelines on designated germplasm”, “recipient must make any research results freely available to the public everywhere”). Please include information on any restrictions or conditions that may impact the Programme’s ability to either make the research results freely available everywhere or its ability to protect the research results using IP.

Assignment – a legal document which transfers title/ownership in the IP from the Third Party to yourself.

Joint Ownership – in this situation, you co-own the IP with the Third Party, with such co-ownership often arising by co-discovery or by a contract establishing co-ownership of any IP developed as part of an agreement.

Confidentiality Disclosure Agreement – where the use of information from the Third Party includes limitations and restrictions on whether or how that information can be shared with others.

None or Unknown.

IV. Sample Table of Third Party IP

Description of Third Party IP – <u>what is it?</u>	Source of Third Party IP – <u>where did it come from?</u>	Owner, Assignee or Licensee of Third Party IP – <u>who’s owns it?</u>	IP Rights Owned by Third Party – <u>what kind of IP rights does the owner have?</u>	Status of Third Party IP Rights – <u>do you already have a legal right to use it?</u>
Tangible Property – “Things”				
Rice variety designated XXXX	University of XXXX	Same	Covered by MTA	Can only be used for research results that will be freely available to all. Must recognize the University’s contribution in all public disclosures.
Methods of Doing Something				
Method of introducing a gene into rice. Method is called XXXX	Dr. XXXX	XXXX Seed Company	U.S. Patent No. XXXX and EP Patent No. XXXX; could be additional patents and patent applications?	We have a license to use this method for non-commercial purposes in XXXX only.
Written Text and Computer Code				
Temperature data base for country XXXX from 19XX to 19XX. The data set is dated XX/XX/XX	Colleague XXXX at the XXXX Research Centre	Unknown	Unknown	He just gave me the data set with no conditions.
Algorithm for identifying XXXX genes in rice	From the following publication: XXXX	Author XXXX	Copyright	I did not ask for permission to use it.

APPENDIX 3

The GENERATION Challenge Programme

Cultivating Plant Diversity for the Resource-Poor

Competitive Grants Programme: Call for Proposals

Submissions

By mail:

Generation Challenge Programme
c/o CIMMYT
Apartado # 370
PO Box 60326
Houston, TX 77205 USA

By email: GCP-proposals@cgiar.org

I. OVERVIEW

Programme Purpose

The Generation Challenge Programme for *Cultivating Plant Diversity for the Resource-Poor*, hereafter referred to as the CP, will use plant genetic resources to improve livelihoods and increase food security in developing countries. It will do so by enhancing the use of genetic resources in particular in breeding programmes through innovative initiatives to generate, manage, and apply genomic information derived from comparative studies. It will enhance the public domain as the best means to ensure fair access and benefit sharing for resource-poor farmers. More information on the Challenge Programme can be found at www.generationcp.org.

The activities of the CP are organized around five Subprogrammes:

Director – R. S. Zeigler

Subprogramme 1 – Genetic diversity of global genetic resources (leader: J. C. Glaszmann)

Subprogramme 2 – Comparative genomics for gene discovery (leader: H. Leung)

Subprogramme 3 – Trait capture for crop improvement (leader: J. Crouch)

Subprogramme 4 – Genetic resource, genomic and crop information systems (leader: T. van Hintum)

Subprogramme 5 – Capacity building (coordinator: C. de Vicente)

Programme Governance

The CP is established as a Consortium of eight CGIAR centres (CIAT, CIMMYT, CIP, ICARDA, ICRISAT, IITA, IPGRI, and IRRI), and seven advanced research institutions (the Agropolis (France), Chinese Academy of Agricultural Sciences, Cornell University (USA),

EMBRAPA (Brazil), John Innes Centre (UK), the National Institute for Agrobiological Sciences (Japan), and Wageningen University & Research (Netherlands)). Each Consortium Member is represented on the Programme Steering Committee (PSC), which also includes a representative from the Global Forum for Agricultural Research and an observer from the Executive Committee of the CGIAR. The PSC is chaired by Mr. I. Serageldin, Director of the Library of Alexandria. The PSC is advised on scientific matters by a Scientific Advisory Panel. The Scientific Advisory Panel will be composed of internationally recognized accomplished scientists in the areas of genetic resources, molecular biology, functional genomics, crop improvement, bioinformatics, and capacity building for development. A Stakeholders Committee, consisting of outside observers from developed and developing countries, also contributes to the oversight of the CP. Challenge Programme activities are managed by a management team consisting of the Programme Director (R. Zeigler) and the five other Subprogramme Leaders.

Scope and Purpose of the Competitive Grants Programme

The Competitive Grants Programme will address thematic areas (see below) in each of the first four Subprogrammes. The grants programme seeks to attract the world's best scientific minds to the CP and to broaden partnerships to efficiently and effectively utilize genetic resources in the improvement of staple crops in the developing world. The PSC has determined that approximately half of the resources available to the CP in 2005 (or at least US\$4 million) will be disbursed by this mechanism.

Call for Proposals

The Challenge Programme considers the development of drought tolerant varieties as its most important long term goal; however, proposals that address other important traits (e.g. biotic and abiotic stresses and quality traits with high potential for payoffs) and/or that develop generic tools of broad applicability across the Programme will also be considered. We encourage submissions that integrate genomics with modeling whole plant physiology and/or biology associated with drought tolerance QTL. The CP also wishes to validate and refine large-scale, low cost technologies for germplasm genotyping, allele mining, and molecular breeding. Capacity building activities should be built into all Subprogramme activities. Cross-cutting capacity building initiatives will be commissioned outside of the competitive grants process.

This call for proposals invites proposals in the following thematic areas for each Subprogramme. These themes reflect the status and technical scope of current CP objectives in each area:

SP1 – Genetic diversity of global genetic resources

This Subprogramme aims to assess the genetic diversity in germplasm collections and to identify superior alleles at loci of interest by comparing trait variation and molecular polymorphisms. It is expected that a range of approaches will be appropriate, including neutral markers, known sequences, SNPs, and candidate gene analysis. Proposals should consider development of tools and methodologies for exploratory research as well as high throughput implementation of:

- Characterization of germplasm collections using random markers (see year 1 work plan, <http://www.generationcp.org/sp1clusters.htm>, for those crops for which characterization is already underway);
- Approaches for in depth sub-sampling of characterized collections;

- High throughput, genome-wide scanning methodologies;
- Optimization of SNP discovery and survey methodologies;
- Development of appropriate and extendable phenotyping protocols and establishment of phenotyping centres of excellence.

SP2 – Comparative genomics for gene discovery

This Subprogramme aims to identify genes and gene combinations that are responsible for stress tolerance in one or more crop species. Proposed projects should maximize the use of genomic and genetic resources available in the research community to identify and validate gene function important for stress tolerance. Innovative comparative genomic approaches that leverage genetic information from multiple plant species are encouraged. Emphasis will be on linking molecular variation at candidate gene loci with phenotypes at the biochemical and whole plant levels that will eventually lead to identification of functional nucleotide polymorphisms to be used effectively in breeding programmes. The Challenge Programme considers drought tolerance as an important test case; however, as mentioned above, proposals that address other biotic and abiotic stresses or quality traits with high potential for payoffs will also be considered.

SP3 – Trait capture for crop improvement

The goal of this Subprogramme is to validate gene-based marker systems and to develop appropriate technologies for their rapid and cost effective utilization by national breeding programmes across the developing world. In this context, we primarily seek proposals that include proof-of-concept introgression, pyramiding, and evaluation of QTLs for drought tolerance. As mentioned above, proposals that address other abiotic and biotic stress traits and quality traits of economic and/or social priority will also be considered. These projects must address genotype-by-environment interaction of target traits, effect of introgression on economic yield, and cost-benefit analysis of the proposed application of molecular breeding. Projects that include modeling whole plant physiology/biology associated with drought tolerance QTL and integrate various disciplinary approaches (breeding, physiology, molecular genetics) are especially welcome.

The CP also seeks proposals that facilitate the generation and uptake of molecular breeding products and strategies by national breeding programmes through shuttle genotyping in regional hubs. These projects must address product delivery pathways, impact assessment, and value chain issues. Finally, we wish to fund the development of low tech, high throughput technologies for rapid low cost implementation of MAS and MAB by breeding programmes in developing countries.

SP4 – Genetic resource, genomic, and crop information systems

This Subprogramme is the informatics, analytical, and communications platform upon which the other Subprogrammes depend. We seek proposals that include the development of analytical tools for allele discovery, QTL analysis, association genetics, and/or other approaches that may be required for the success of the other Subprogrammes. Proposals for means to link databases developed across Sub-programmes, crops, projects etc. are encouraged. Thus, we invite

submissions for the development/validation/refinement of analytical tools for sequence-based chip systems for simultaneous screening of hundreds of markers across thousands of genotypes for germplasm characterization, allele mining, and marker-assisted selection and breeding.

Specific areas of interest include:

- Development and refinement of controlled vocabularies and ontologies relevant to CP activities;
- Design and deployment of high level interoperability between relevant data resources;
- Methodology and implementation of data quality assurance standards and procedures;
- Analysis and visualization tools to support CP activities including diversity analysis, analysis of expression data, mapping and other integration of phenotype and molecular data;
- Development of informatics applications to support allele mining and molecular breeding

Eligibility

- Proposals must clearly address research themes outlined above, and should clearly indicate which Subprogramme(s) is (are) being targeted. Do not indicate more than two Subprogrammes.
- Lead Principal Investigators (PI) for competitive grants must come from one of the consortium members. The Consortium Member hosting the PI will submit the proposal.
- Co-PIs may come from any consortium member (see <http://www.generationcp.org/consortium%20members.htm> for a list of consortium members), and non-consortium institutions such as non-profit research institutions, developing country research and/or education institution, or private sector for-profit organizations. Partners from outside the Consortium and from developing countries are strongly encouraged.
- Advanced institutions and private sector partners are expected to demonstrate contribution of significant resources to the proposed activities.
- At least one partner on each project must be from a research and/or educational institution from a developing country (see Appendix 1 for a list of developing countries).
- No Consortium Member will submit (i.e. have one of its staff as PI on) more than two pre-proposals for any Subprogramme in any single call for proposals. A Consortium member may also submit one start-up proposal (see below).
- A Consortium Member may submit a maximum of five pre-proposals and one start-up proposal.
- Individuals may not be PIs on more than two submissions, and may not be Co-PIs on more than four.

- With respect to future competitions, individuals may not be PI on more than two concurrently funded competitive grants projects and may not be Co-PIs on more than four.

Selection Criteria

The evaluation criteria and weighting of different components to be applied in evaluating proposals for competitive grants are:

- | | |
|---|-----|
| • Feasibility (potential to achieve proposed objectives and outcomes) | 30% |
| • Creation of <i>novel</i> outputs to the identified themes | 20% |
| • Capacity building of developing country national programme scientists | 15% |
| • Contribution to comparative biology for solving complex production problems | 15% |
| • Scientific merit and originality | 10% |
| • Strength of, and rationale for, proposed partnerships | 10% |

These criteria reflect the overall objectives of the CP but may be adjusted in light of its progress and as new opportunities arise.

Intellectual Property

Competitive grants will only be made to scientific teams working in institutes which explicitly accept the IP policy of the CP. These are set forth in the CP Consortium Agreement. This will be made available at the time full proposals are invited.

Scientific Oversight and Evaluation of Proposals

The PSC will be advised by an independent Scientific Advisory Panel. One member of this Panel will serve as chair of the competitive grants review panel. This review panel will further be composed of ad hoc reviewers widely recognized as experts in the fields addressed in this CP. The review panel will evaluate pre-proposals, recommend the development of full proposals, evaluate and rank those full proposals, and recommend projects for funding to the Management Committee. The Management Committee will review these recommendations and forward these to the PSC with its comments and recommendations. In the event that proposals ranked in the highest categories exceed the available funds, the Management Committee will recommend funding priorities to the PSC. The PSC is responsible for the final determination of awards.

The Management Committee will monitor programmatic focus, scientific quality, progress on technology generation, and technology transfer for all competitive grant projects, and will recommend those for continuance to their full term.

Size of Awards

Two categories of grants will be awarded: a) Start-up grants for 1-2 years for up to \$100,000 total; and b) Standard grants of up to \$300,000/year for up to 3 years. The balance among the two types of grants will be determined by funding availability, relative balance of submissions, and priorities within the Subprogrammes.

Grant Awards Process

The selection of awards will be a two-step process. The first step will be submission of pre-proposals (see instructions in section II). Pre-proposals must be directed to themes under one of the four Subprogrammes specified above. The pre-proposals will be evaluated by the review

panel which will recommend those to be advanced for full proposal development. The second step will be submission of full proposals (section III). PIs of pre-proposals selected to develop full proposals will be notified by the CP Director. Review panel comments will be provided to all PIs. The number of pre-proposals selected for full proposal development will be such that the anticipated award rate will exceed 50%. However, the award rate will ultimately be determined by the final amount of funding available to the programme. Full proposals will be reviewed by the same panel.

Time Frame

Pre-proposals must be submitted by May 15 and will be screened in June. PIs of projects for full proposal development will be notified by July 1. Full proposals will be submitted by September 1. Awards will be made in November for work to start in January of 2005. Calls for proposals may occur under individual Subprogrammes at other times of the year if special funding opportunities arise. NOTE: Proposals received after the deadline will not be considered.

Continuity of Funding

Projects may be funded for up to three years. Funding for this programme will be established annually by the CGIAR and so cannot be assured for more than one fiscal year. *Therefore, although grants may be awarded for multiple years, funding can only be assured on an annual basis.*

Continued funding will be contingent on sufficient funds being made available from the CGIAR and on satisfactory progress.

II. PREPARATION AND SUBMISSION OF PRE-PROPOSALS:

Format:

Paper size: 8 ½ x 11 inch or A4; 12 pt font size; 1 inch (2.54 cm) margins.

Cover Page:

Title
Targeted Subprogramme(s)
Lead PI and Collaborating Scientists (co-PIs)
Participating Institutions
Submission Date

Executive Summary (limit of 300 words)

Summary of Objectives, Activities, and Expected Outputs (limit 3 pages)

Letters of Intent from partners indicating their willingness to participate in the proposal

One-page c.v. for each PI and co-PI

Indicative Budget (Broken down by Institution):

Salaries (show appropriate benefits as a separate line)

- Supplies and Services
- Travel
- Training (tuition, living expenses, etc.)
- Equipment
- Indirect Costs (limited to 18%)
- In-Kind Contribution

Pre-proposal Submission Instructions

Pre-proposals should be submitted to the Challenge Programme Director by mail (Apartado # 370, PO Box 60326, Houston TX 77205 USA) or as an e-mail attachment (GCP-proposals@cgiar.org) according to the time frame outlined in section I.

III. PREPARATION AND SUBMISSION OF FULL PROPOSALS

PIs for pre-proposals selected to advance to full proposal development will be notified according to the time frame outlined in section I.

Format: Paper size: 8 ½ x 11 inch or A4; 12 pt font size; 1 inch (2.54 cm) margins.

Proposal Contents:

Cover Page

Table of Contents

Executive Summary (300 word maximum) suitable for a non-scientific audience

Scientific Summary (300 word maximum)

Project Description (10 pages): Objectives and Intended Specific Outcomes

- Introduction and Rationale

- Approach and Methods

- Partners

Management Plan

Critical Assumptions and Contingency plans

Timeline and Milestones

Budget (broken down as in pre-proposal)

Global Budget (annual and summary)

Budget by Partner (annual and summary)

Budget Notes and Justification

Appendices

Description of Partners (demonstrating their capacity to undertake to the project and a rationale for the proposed partnership)

CVs of PI, co-PIs and Collaborating Scientists (maximum two pages each including references for five most recent relevant publications)

Letters of Intent from Partner Institutions specifying resource, in-kind etc. commitments, if appropriate

Intellectual Property Statements from each partner

Full Proposal Submission Instructions

Full proposals should be submitted to the Challenge Programme Director by mail (Apartado # 370, PO Box 60326, Houston TX 77205 USA) or as an e-mail attachment (GCP-proposals@cgiar.org) according to the time frame outlined in section I.

Appendix 1 (to Call for Proposals)

Developing Countries (as defined by the World Bank <http://www.worldbank.org/data/countryclass/countryclass.html>)

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