



## Why GCP?

GCP's network helps to advance the frontiers of knowledge and develop practical tools such as molecular markers for desirable genes, so as to promote efficient field selection in plant breeding. Through our network of partners in the CGIAR, as well as in the public and private sector, GCP implements projects and programmes that bring together plant scientists from different disciplines to improve crops for the ultimate benefit of resource-poor farmers. GCP works with cutting-edge plant biology research partners, and augments the efforts of the CGIAR and the broader agricultural research-for-development community.

Created by the CGIAR in 2003 as a timebound 10-year Programme, GCP's goal is to add value to crop breeding, targeting farmers in drought-prone environments.

Through capacity-building and by assisting national researchers to tap into a broader and richer pool of plant genetic diversity, GCP strives to ensure that crops improved by cutting-edge science will reach farmers in the developing world.



CGIAR Generation Challenge Programme (GCP)  
Hosted by CIMMYT

(Centro Internacional de Mejoramiento de Maíz y Trigo;  
the International Maize and Wheat Improvement Center)

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*For millennia, generations of farmers have known about – and used – plant genetic diversity. Farmers identify plants with particular traits, or plants that thrive in unfavourable conditions. Seeds and cuttings from these selected plants are carefully preserved for the next sowing season. This ancient and time-tested breeding strategy is now the root of novel plant science in our time.*

September 2009

CGIAR Generation Challenge Programme

CULTIVATING PLANT DIVERSITY FOR THE RESOURCE-POOR



## Who we are

The Generation Challenge Programme (GCP) is one of five Challenge Programmes of the Consultative Group on International Agricultural Research (CGIAR). GCP is a broad network of partners from developing and developed country research programmes, collectively working at both national and international level to improve crop productivity in drought-prone environments. GCP partners draw on plant diversity and new technologies to improve crops with desired traits, focusing on drought tolerance. Through this wide range of partners, GCP links basic science with applied research and helps to weave an effective and interactive community of crop researchers at both global and regional level.

## Why is plant genetic diversity important?

First, plant genetic diversity is obvious: for the same crop, some plants are tall and some short, some survive extreme climates, or are

naturally pest-resistant. Deciphering the full set of the plant's genetic information – also known as the plant genome – reveals to us the exact factor responsible for these differences. This knowledge is used by crop breeders to generate better-adapted offspring (progeny).

Through the years, researchers have also used this knowledge to gather select genetic material from crops and their wild relatives, thus safeguarding these natural resources for current and future generations. This material is preserved in 'gene banks' – the custodians of genetic diversity.

## What is GCP's core business?

We selectively characterise the diversity of the most important crop germplasm for agriculture, including collections stored in gene banks under the custody of the CGIAR as well as country research programmes. Using this diversity, GCP applies genomic tools and interdisciplinary approaches to better understand gene function and gene

interactions. This understanding of gene systems across crops helps to identify and tag genes which contribute desired agronomic traits. Selection of favourable alleles (ie, variants) of those genes increases the efficiency, speed and scope of plant breeding.

GCP also integrates information components and analysis tools into a coherent information gateway and provides support for data storage and analysis. To ensure impact, GCP empowers scientists in developing country programmes to use modern breeding. As GCP approaches the end of Phase I (2004–2008) and beginning of Phase II (2009–2013), our new strategy emphasises product management and delivery as crucial cornerstones of GCP's work in the coming years: concepts and ideas at GCP founding are increasingly evolving into useful GCP products, and we remain committed to delivering practical and relevant products to boost breeding and, ultimately, have impact on crop productivity in farmers' fields.

# GCP's five Subprogrammes

## Subprogramme 1 (SP1): Crop genetic diversity

Characterises the diversity of crop germplasm collections in the custody of the CGIAR and national programmes in terms of genetic structure and associated phenotypic variation

## Subprogramme 2 (SP2): Genomics towards gene discovery

Uses or develops genomic tools and technologies and evaluates interdisciplinary approaches to better understand gene function and interaction to improve knowledge of gene systems across crops

## Subprogramme 3 (SP3): Trait capture for crop improvement

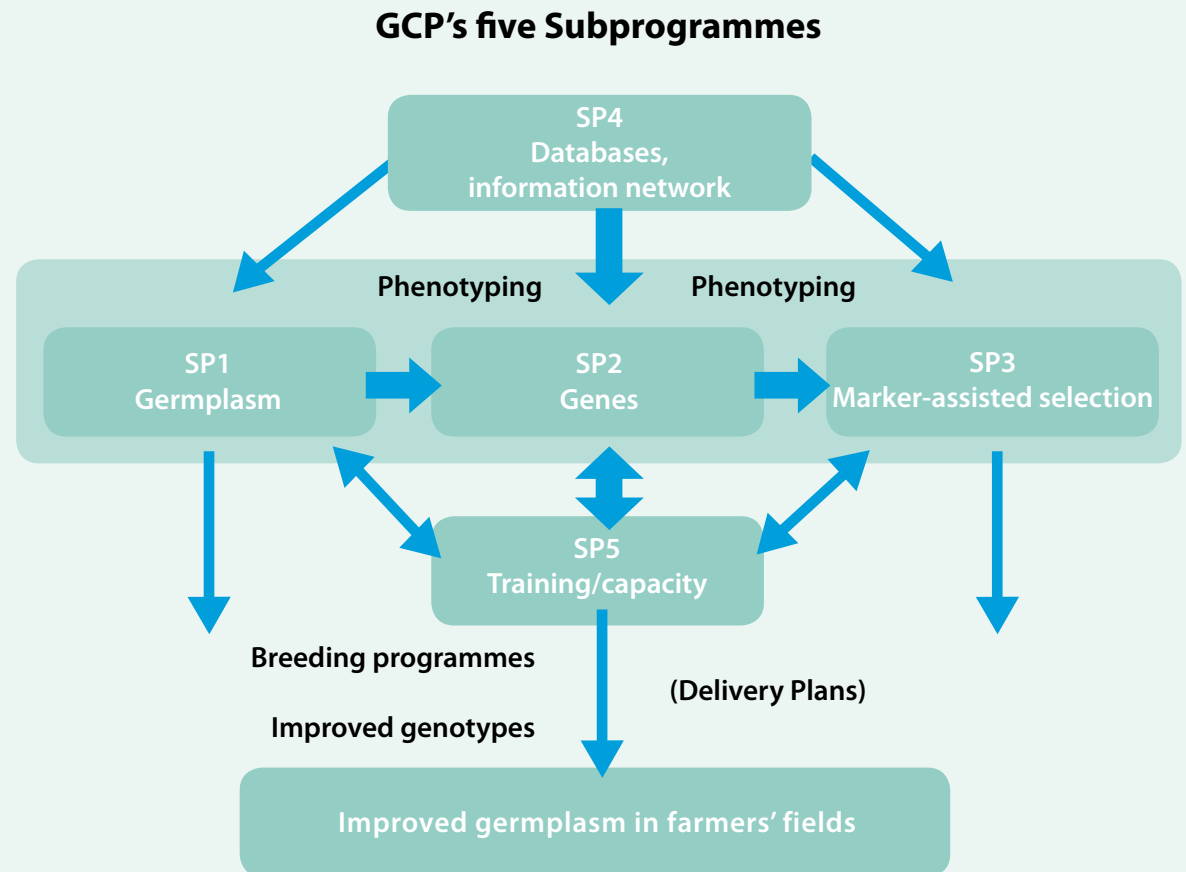
Validates gene function and refines molecular breeding systems and the resulting enhanced germplasm, so as to increase the efficiency, speed and scope of plant breeding

## Subprogramme 4 (SP4): Bioinformatics and crop information systems

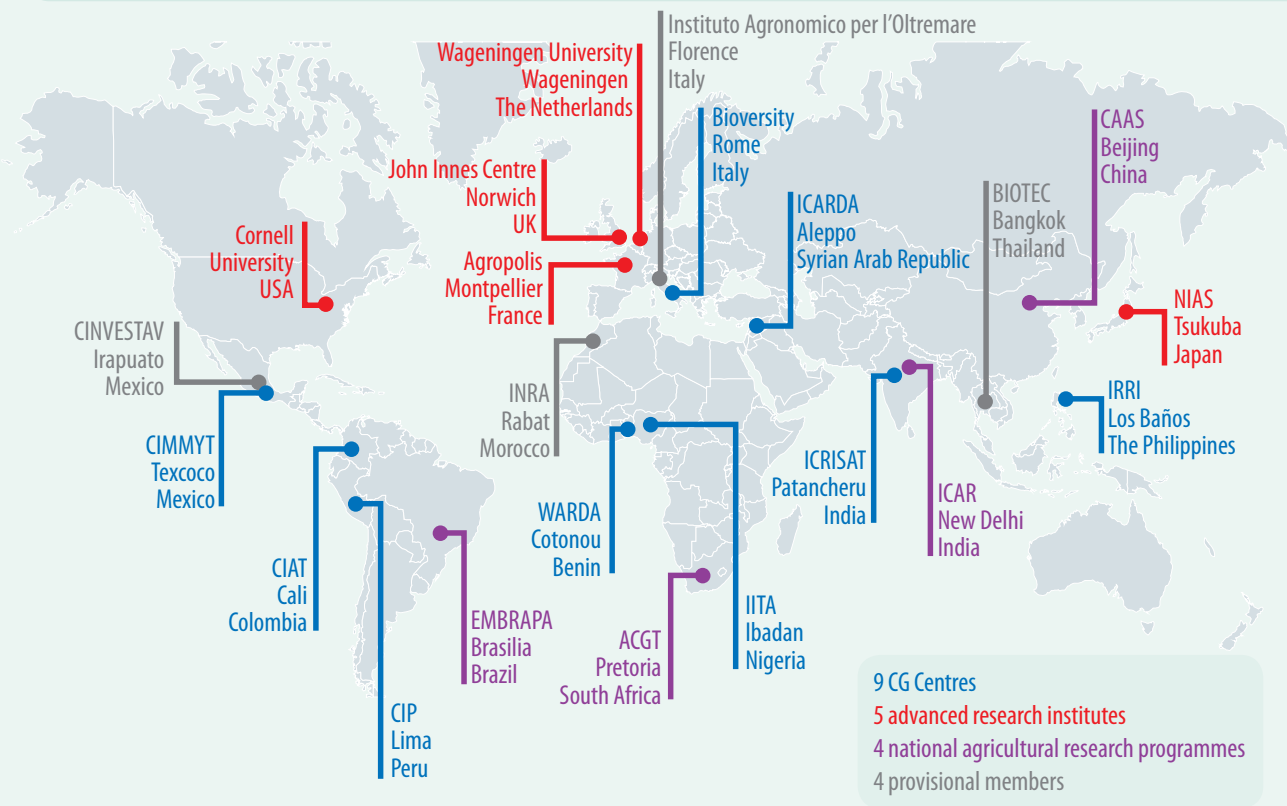
Integrates GCP information components and analysis tools into a coherent information gateway and provides support for data analysis to the other GCP Subprogrammes

## Subprogramme 5 (SP5): Capacity-building and enabling delivery

Empowers scientists in developing country national programmes to use modern breeding approaches. SP5 also coordinates the development and implementation of project Delivery Plans and is responsible for intellectual property issues, and research in policy and impact assessment.



# The GCP Consortium



## Full members

1. Africa Rice Center (WARDA)
2. African Centre for Gene Technologies (ACGT)
3. Agropolis, France (incorporating CIRAD, IRD and INRA)
4. Bioversity International
5. Centro Internacional de Agricultura Tropical (CIAT; International Center for Tropical Agriculture)
6. Centro Internacional de la Papa (CIP; International Potato Center)
7. Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT; The International Maize and Wheat Improvement Center)
8. Chinese Academy of Agricultural Sciences (CAAS)
9. Cornell University, USA
10. Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA; Brazilian Agricultural Research Corporation)
11. Indian Council of Agricultural Research (ICAR)
12. International Center for Agricultural Research in the Dry Areas (ICARDA)
13. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
14. International Institute of Tropical Agriculture (IITA)
15. International Rice Research Institute (IRRI)
16. John Innes Centre (JIC), UK
17. National Institute of Agrobiological Sciences (NIAS), Japan
18. Wageningen University and Research Centre (WUR), The Netherlands

## Provisional members

19. Centro de Investigación y de Estudios Avanzados (CINVESTAV), Mexico
20. Institut National de la Recherche Agronomique (INRA), Morocco
21. Istituto Agronomico per l'Oltremare (IAO), Italy
22. National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand

# Where in the world is GCP? The GCP network in 2008

## In 2008, GCP worked with partners in 64 countries:

### Central and West Asia and North Africa

1. Iran
2. Morocco
3. Syria

### Latin America and the Caribbean

4. Argentina
5. Bolivia
6. Brazil
7. Chile
8. Colombia
9. Costa Rica
10. Cuba
11. Haiti
12. Mexico
13. Nicaragua
14. Peru
15. Uruguay

### South and Southeast Asia

16. Bangladesh
17. Cambodia
18. China
19. India
20. Indonesia
21. Laos
22. Myanmar
23. Pakistan
24. Sri Lanka
25. Thailand
26. The Philippines
27. Vietnam

### Sub-Saharan Africa

28. Burkina Faso
29. Burundi
30. Cameroon
31. Democratic Republic of Congo

### Others

32. Ethiopia
33. Ghana
34. Kenya
35. Madagascar
36. Malawi
37. Mali
38. Mozambique
39. Niger
40. Nigeria
41. Rwanda
42. Senegal
43. South Africa
44. Sudan
45. Tanzania
46. Uganda
47. Zimbabwe

### Others

48. Australia
49. Austria
50. Belgium
51. Canada
52. Denmark

53. France
54. Germany
55. Hungary
56. Italy
57. Japan
58. Russia
59. South Korea
60. Sweden
61. Switzerland
62. The Netherlands
63. UK
64. USA

