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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Eighth Session

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REPORT FROM THE GLOBAL CROP DIVERSITY TRUST TO THE INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

I. INTRODUCTION

1. Established in 2004 under international law as an independent international organization, the Global Crop Diversity Crop Trust (the Crop Trust) operates within the framework of the International Treaty on Plant Genetic Resources for Food and Agriculture (the Treaty) as an essential element of its Funding Strategy and in accordance with the overall policy guidance provided by its Governing Body. The Crop Trust's objective as stated in its Constitution is "*to ensure the long-term conservation and availability of plant genetic resources for food and agriculture with a view to achieving global food security and sustainable agriculture.*" The Constitution further states that "*the Trust shall in particular, without prejudice to the generality of the foregoing,*

- *endeavour to safeguard collections of unique and valuable plant genetic resources for food and agriculture held ex situ, with priority being given to those that are plant genetic resources included in Annex I to the International Treaty or referred to in Article 15.1(b) of the International Treaty;*
- *promote an efficient goal-oriented, economically efficient and sustainable global system of ex situ conservation in accordance with the International Treaty and the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (hereinafter referred to as "the Global Plan of Action");*
- *promote the regeneration, characterization, documentation and evaluation of plant genetic resources for food and agriculture and the exchange of related information;*
- *promote the availability of plant genetic resources for food and agriculture; and*
- *promote national and regional capacity building, including the training of key personnel, with respect to the above."*

2. The Relationship Agreement between the Crop Trust and the Governing Body of the Treaty recognizes the Crop Trust "*as an essential element of the Funding Strategy of the International Treaty in relation to ex situ conservation and availability of plant genetic resources for food and agriculture*". It notes that the Crop Trust established an endowment with the objective of "*providing a permanent source of funds to support the long-term conservation of the ex situ germplasm collections on which the world depends for food security*". In this regard, the Agreement highlights the call in the first Global Plan of Action for Plant Genetic Resources for Food and Agriculture (GPA) for the "*development and support of a rational, efficient and sustainable system of genetic resources collections around the world*", re-emphasized in the Treaty's call for contracting parties to "*cooperate to promote the development of an efficient and sustainable system of ex situ conservation*".

3. The Crop Trust, in accordance with its Constitution and the Relationship Agreement with the Governing Body, focuses on *ex situ* (genebank) conservation and availability of plant genetic resources for food and agriculture. It addresses major portions of the Treaty including Articles 5 and 6, and much of Articles 7, 8, 9, 14, 16, 17.

4. The Commission on Genetic Resources for Food and Agriculture (the Commission) at its Ninth Regular Session welcomed the establishment of the Crop Trust and appealed to donors to support it. At subsequent sessions, the Commission has noted the Crop Trust's efforts in mobilizing funding for *ex situ* conservation and in furthering the aims of the Global Plan of Action, and in particular the objective "*to develop a rational, efficient, goal-oriented, economically efficient and sustainable system of ex situ conservation and use for both seed and vegetatively propagated species*" (Priority Activity 6).

5. Building an efficient and sustainable global conservation system is at the core of the Crop Trust's work. The endowment fund provides long-term stable funding to crop collections of global importance, such as the international The Crop Trust is pleased to submit this report on its activities to the Eighth Session of the Intergovernmental Technical Working Group on PGRFA. This report provides an update on both institutional and programmatic development.

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II. INSTITUTIONAL DEVELOPMENTS

7. The Crop Trust was established by FAO and Bioversity International (on behalf of the CGIAR Centres), and jointly hosted by the two organisations in Rome pending a permanent host-country agreement. After a thorough study of proposals submitted by a number of different countries, the Crop Trust's Executive Board took the decision to accept the headquarter agreement offered by the government of Germany. Accordingly, since January 2013 the Crop Trust has been operating from its new offices in Bonn.

8. The members of the Executive Board are nominated by the Governing Body of the Treaty and by the Donors' Council. In addition, there are non-voting members appointed by FAO and CGIAR. The Board generally meets twice a year and reports of its decisions are available on the Crop Trust website. Government donors who have contributed USD 25 000 or more are invited to join the Crop Trust's Donors' Council; for private sector donors the threshold is USD 250 000. The Council meets annually and provides financial oversight and advice to the Executive Board. The Council's reports and the complete list of donors can be found on the Crop Trust website.

9. The Board Chair is Ambassador Walter Fust from Switzerland, former head of the Swiss Agency for Development and Cooperation. In March 2013, Ms Marie Haga took up the position of Executive Director, following the retirement of Professor Cary Fowler in 2012. Ms Haga has held three ministerial positions in Norway and was a member of the Crop Trust's Board from 2010-2012. In 2015, the Crop Trust welcomed two new Executive Board members, namely Mr Alexander Mueller (Germany), nominated by the Donors' Council, and Mr Knut Storberget (Norway), nominated by the Board itself. A representative from the CGIAR, Prof. Wayne Powell, also participated in the 2016 EB meeting. All changes in the membership of the Executive Board and staff of the Crop Trust are described on the website¹.

10. The Crop Trust has an important mandate consistent with the requirements of the Treaty and the Second Global Plan of Action, but financial resources are limited. The Crop Trust focuses funding on activities that provide maximum global benefits, are cost-effective, efficient and sustainable. The Crop Trust operates on the basis of a Fund Disbursement Strategy, which was adopted by the Crop Trust's Executive Board in 2009 after consultation with the Governing Body of the Treaty and Donors.

11. Following a Pledging Conference in April 2016, since its inception the Crop Trust has raised a total of USD 512 million, of which some USD 314 million are for the endowment. This represents significant progress towards reaching its endowment target and the programmatic goals recognized in its Relationship Agreement with the Governing Body and set out for itself in its Constitution and Fund Disbursement Strategy. Further work remains to be done to reach the medium-term endowment target of USD 500 million. This will include additional financial support from governments as well as increased collaboration with partners from the private sector.

12. The Crop Trust contributes significantly to implementation of the Treaty and the Second Global Plan of Action. The Crop Trust thus appeals to countries and donor agencies to summon the political will at the highest level to make the investment needed to secure crop diversity through its endowment fund.

¹ <http://www.croptrust.org/content/staff>

III. PROGRAMME DEVELOPMENTS

A. Global crop strategies

13. In the first years of its existence, between 2004 and 2010, the Crop Trust gathered together groups of experts to develop a series of global crop conservation strategies. In 2015, the Crop Trust again put existing strategies to use in targeting action, and began work on new ones. A consultant developed a strategy for Bambara groundnut. A survey was done on the status of apple collections globally and apple experts held a workshop to develop a strategy. A survey was also undertaken, and first meeting held, for tropical and sub-tropical forages. A work plan has been put in place for systematically securing the diverse plants that power sustainable livestock production. Finally, plans were made to develop strategies for citrus and coffee in 2016.

14. The global strategy for coconut, first drafted in 2008, reflected the conservation community's concerns about the vulnerability of the crucial South Pacific coconut genebank in Papua New Guinea. In 2015, this large and unique field collection continued to be threatened by the spread of Bogia Coconut Syndrome from surrounding areas. The Crop Trust convened a meeting at the site of the genebank where 27 participants from international and national institutes could assess the problem for themselves and work out a rescue plan.

B. Long-term conservation and availability of crop diversity

15. Article 5.1e of the Treaty requires that Contracting Parties “*cooperate to promote the development of an efficient and sustainable system of ex situ conservation ...*” and Priority Activity 6 of the Second Global Plan of Action has as an objective “*to develop a rational, efficient, goal-oriented, economically efficient and sustainable system of ex situ conservation and use for both seed and vegetatively propagated species*”. At the core of the Crop Trust is the endowment fund, created to provide financial security to globally important collections of crop diversity in perpetuity.

16. As the endowment fund grows, the income it generates is used to provide in-perpetuity funding to collections of crop diversity of global importance that are conserved at international standards and available in accordance with the terms and conditions of Part IV of the Treaty.

17. To date, the Crop Trust has approved long-term grants to 9 CGIAR genebanks and the genebank of the South Pacific Community (SPC), all Article 15 collections. The funding is supporting the conservation and availability of 20 international collections of 17 major crops². The supported collections serve an exclusively international role as crucial parts of a rational, efficient and effective global system. In addition, the Crop Trust funds the annual operating costs of the Svalbard Global Seed Vault (see below).

18. Long-term grants now total USD 2.5 million annually, and, since their initiation in 2006, a total of USD 16.3 million has been disbursed from the Crop Trust endowment. In 2012, funding for the routine activities of the 11 CGIAR-held international collections, complementing the long-term grants from the endowment, was secured and stabilised for the following five years with the initiation of the new Crop Trust-CGIAR program called the “CGIAR Research Program for Managing and Sustaining Crop Collections” (Genebanks CRP). This program aims to increase efficiencies and quality management, optimize conservation protocols, develop genebank data management systems and, most importantly, provide long-term stability of funding.

² Crops supported by the Crop Trust through long-term grants are: banana and plantain, barley, bean, cassava, chickpea, edible aroids, faba bean, forages, grass pea, lentil, maize, pearl millet, rice, sorghum, sweet potatoes, wheat, and yam.

19. Ten of the 11 international genebanks of the CGIAR have undergone review by external experts since the beginning of the CRP, and all are now implementing work plans to address recommendations concerning all aspects of genebank management.

20. The CGIAR genebanks presently manage 750 033 accessions, including 28 851 in vitro accessions and 30 991 accessions held as plants or trees in the field. Approximately 75 percent of total accessions are immediately available for international distribution under the SMTA; this continues the steady increase in the availability of accessions since the CRP was launched, and is particularly significant when the substantial distribution and acquisition of samples is taken into account. Of the seed accessions, 53 percent is secured in safety duplication at two levels and, 74 percent of accessions of clonal crop collections is safety duplicated in the form of in vitro or cryopreserved samples. Currently, 84 percent of the accessions have passport or characterization data accessible online. The level of safety duplication of seed accessions declined in 2015 due to the return of material from the Svalbard Global Seed Vault to ICARDA (see below). By contrast, a significant increase was achieved in the safety duplication of clonal accessions from 52 percent in 2014 to 71 percent in 2015, due to increased efficiency at both CIP and IITA in in vitro duplication.

21. A total of 91 506 germplasm samples was provided by the CGIAR genebanks to users in 2015; 32 850 distinct accessions were provided to users within the CGIAR and 20 010 accessions were distributed outside the CGIAR directly to advanced research institutes and universities (43 percent), NARS (32 percent) and to farmers and the private sector (25 percent) in 114 countries. These germplasm flows represent the overwhelming majority of distributions using the SMTA of the Treaty.

22. Through the CRP's quality management system initiative, the Crop Trust organized a "Genebank Operations and Advance Learning" (GOAL) workshop for 35 genebank staff from CIMMYT, CIP, CIAT, INIA-Ecuador, INIA-Peru and CORPOICA (Colombia). The workshop represents the first of a series of five planned GOAL workshops, in which specialized genebank staff share practices and knowledge on different genebank operations, data management and policy implementation. Standards are discussed and modified for eventual incorporation into individual genebank standard operating procedures (SOPs). This is a key medium for raising and sharing standards across the CGIAR system and beyond to national partners.

23. The Treaty cites the need "to take appropriate steps to minimize or, if possible, eliminate threats to PGRFA" (Article 5.2) and the Second Global Plan of Action has as an objective "to provide for the planned replication and safe storage of materials not currently safety duplicated". Safety duplication is recognized as an essential element of good genebank management practice aimed at minimizing risk to ex situ collections. The Crop Trust supports the duplication under black-box conditions of unique accessions of the world's most important crop collections at the Svalbard Global Seed Vault, in Norway, as an ultimate safety net.

24. The Seed Vault, welcomed unanimously by the then 172 Members plus EU of the Commission, was officially launched in February 2008 and provides virtually fail-safe security for duplicate samples of PGRFA. Since it opened its doors in 2008, the Vault has accepted deposits on some 30 occasions, and now holds a total of 843 400 accessions from 66 institutes,³ the deposit of about 70 percent of which was funded by the Crop Trust. This includes ca. 560 000 accessions from the international collections managed by CGIAR Centres.⁴

25. ICARDA, one of the CGIAR Centres, previously located in Aleppo, Syria, became the first depositor to ask for deposited seeds to be returned. In September 2015, 38 073 accessions of wheat, barley, forage crops and other species were returned to ICARDA units in Morocco and Lebanon to

³ Full details of holdings can be found at: <http://www.nordgen.org/sgsv/>

⁴ An analysis of Svalbard Global Seed Vault holdings is provided at: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0064146>

help re-establish the active collections. Multiplication of this material has begun and will include safety duplication at Svalbard.

26. The Crop Trust is contributing to the annual management and operating costs of the facility.

C. Information and information systems

27. Article 17.1 of the Treaty requires that Contracting Parties “*cooperate to develop and strengthen a global information system to facilitate the exchange of information, based on existing information systems, on scientific, technical and environmental matters related to plant genetic resources for food and agriculture, with the expectation that such exchange of information will contribute to the sharing of benefits by making information on plant genetic resources for food and agriculture available to all Contracting Parties.*” Articles 13.2(a) and 12.3(c) address requirements to make information available. Priority Activity 15 of the Second Global Plan of Action calls for “*Constructing and strengthening comprehensive information system for plant genetic resources for food and agriculture*”. The Crop Trust has supported the implementation of two initiatives to enhance the management and availability of information about PGRFA:

- The Crop Trust partnered with the US Department of Agriculture (USDA) and Bioversity International to develop and deploy a state-of-the-art genebank data management software package, GRIN-Global. Version 1.0 was released at the end of 2011 and an improved version 1.9 replaced the original USDA GRIN system in November 2015. More information can be found on the GRIN-Global website⁵. GRIN-Global is being adopted or evaluated by 6 CGIAR centres and SPC. In the past 2 years, 12 national programmes have received training in GRIN-Global. A GRIN-Global Frontrunner position has been established at CIMMYT to provide a helpdesk service to national and international genebanks who seek to explore GRIN-Global for documentation management.
- The Crop Trust and Secretariat of the Treaty supported the Centres of CGIAR, under Bioversity’s leadership, to develop a global on-line portal to accession-level passport information. The portal, Genesys⁶, is now managed by the Crop Trust. Built on existing collaborative information systems – namely SINGER, EURISCO and GRIN – it allows searching across some 2.5 million active accessions held in 447 genebanks. In addition to passport data, Genesys includes characterization and evaluation data from USDA and some CGIAR Centres. A new user interface was developed in 2015.
- In furtherance of Article 17.1 of the Treaty and Priority Activity 15 of the Second Global Plan of Action, the Crop Trust is continuing to support the development of Genesys as a fundamental component for an effective global conservation system. It is also assisting genebanks with the analysis of their documentation needs, the adoption of GRIN-Global as appropriate, and making information on their collections available through Genesys, thereby contributing to global collaboration.
- To that end, the Crop Trust supported visits by genebank documentation experts to 26 national and regional genebanks in 2014 and 2015: 5 in East and Southern Africa, 10 in Near East and North Africa, 9 in Latin America and 2 in Asia and Pacific. The Crop Trust is also providing financial and technical support to genebanks based on the results of these assessments. Support to establish solid IT infrastructure for data management was provided to 4 genebanks in 2015 and is planned for an additional 11 genebanks in 2016.

D. Adapting agriculture to climate change: collecting, protecting and preparing crop wild relatives

28. The Commission, at its Thirteenth Regular Session, highlighted the importance of both *in situ* and *ex situ* conservation of crop wild relatives (CWR) to enable adaptation to climate change. In 2011,

⁵ www.grin-global.org

⁶ www.genesys-pgr.org

the Crop Trust launched a 10-year project to collect high-priority diversity of the wild species related to 29 Annex 1 crops, to secure that diversity for the long-term, and to use it to prepare materials useful to breeding programmes around the world in adapting these crops to climate change. The project, with the above title, is funded by the Government of Norway and guided by an Advisory Group comprising experts and representatives of the Secretariat of the Treaty and CGIAR Centres. It is being implemented in partnership with the Millennium Seed Bank (MSB) of the Royal Botanic Gardens, Kew, UK and with specialist institutes and national and international conservation and pre-breeding programmes around the world.

29. The CWR in a total of 92 genera, including the project's 29 target crops, have been catalogued and the database is searchable on the portal "Crop Wild Relatives & Climate Change" as "The Harlan and de Wet Crop Wild Relative Inventory"⁷. A dataset has been assembled from numerous online and expert sources, representing the largest and most comprehensive resource on the geographic occurrence of the wild relatives of the world's major crops. This dataset has been analysed to identify high priority species and regions for collecting⁸.

30. Collecting and conservation of CWR is currently being supported in 20 countries through grant agreements between national institutions and the Crop Trust. These recognize all relevant national laws and international agreements, and provide for technical backstopping by staff of the Millennium Seed Bank and other experts, as necessary. Country-specific field identification guides are being developed by MSB to support national partners in their collecting activities, and will represent a long-term resource and important contribution to capacity building.

31. In preparation for the pre-breeding phase of the project, crop-specific consultations have been held with a wide range of breeders and other researchers who have experience in the use of CWRs. Consultations have been held on: potato, common bean and lima bean, chickpea, oat, rye, sunflower, wheat, Asian and African rice, barley, eggplant, sweet potato, alfalfa, lentil, banana and plantain, cowpea, sorghum, apple, pigeon pea, finger and pearl millet, pea and carrot. Pre-breeding projects are now underway on 18 crops, involving some 51 national and international partners in 30 countries, with all material developed being made available under the SMTA.

⁷ <http://www.cwrdiversity.org/checklist/>

⁸ <http://www.cwrdiversity.org/conservation-gaps/>