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Some Thoughts on the Treaty and UPOV

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Feeding the world

- Supplying humankind with a secure supply of nutritious food in the face of growing populations, diminishing arable land and the vagaries of climate change is a monumental task.
- It requires the best cultural practices we can invent and a continuous flow of improved varieties.
- Breeding programs must have sources of genetic variability in order to create these improved varieties.
- Breeding programs must have financial resources to exist.



Use of PGRFA in Modern Breeding

- IRRI data show that less than 1% of their extensive rice collection gets used in variety development
- Breeders spend almost all of their effort on building linkage blocks that are adapted to the target environment and utilization. These elite “trained populations” are their bread and butter.
- This is a time and resource consuming process even with modern technology. The balance is easily disrupted with exotic germplasm
- Much of a breeders task is to relate genotype to phenotype so that the desired genotypes can be selected. This is heritability, the higher it is for a given trait the easier it is for a breeder to improve that trait. Many important traits are controlled by a number of genes and have low heritability.
- Breeders focus on elite germplasm and use exotic germplasm only as a last resort



Use of PGRFA in Modern Breeding

- Much pre-breeding needs to be done to incorporate exotic germplasm into adapted genetic backgrounds
- PGRFA are necessary insurance but breeders will continue to focus on elite materials. There is an ongoing need however to periodically introduce exotic genes into their programs
- There is potential for some increase in the use of PGRFA as breeders seek to access resistance to biotic and abiotic stresses associated with changing climate. This can be greatly facilitated by characterization and documentation of the genetic resources.



Kernen Crop Research Farm





Barley Program Funding

Year	Base	SRP	Ministry of Agriculture	Grants	Private	Royalties
1966	50K	0	0	1.8K	2K	0
2016	300K	250K	1M	300K	1.8M	400K



Roles of the Treaty and UPOV

- The Treaty provides for the conservation and sustainable use of genetic resources which are critical as an ultimate source of genes for plant breeding to create improved varieties.
- UPOV provides a framework for variety protection regimes which are vital for the maintenance of breeding programs which generate improved varieties.
- Both recognize the special nature of crop genetic resources and their vital role in feeding humankind.



Common basis

- The Treaty and UPOV are both based on the special nature of genetic resources for food and agriculture. They are complementary to each other.
- New improved crop varieties are an absolute necessity for feeding the peoples of the world and enhancing the livelihoods of farmers
- There is interdependency among countries for genetic resources. No country is self reliant for crop genetic diversity
- Current and future improvements are built on past accomplishments
- Farmers and crop improvers since the dawn of crop cultivation have contributed
- Impossible to identify and quantify the contribution of any particular peoples



Treaty Objectives

- The objectives of this Treaty are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use



Scope of the Treaty

- The International Treaty on Plant Genetic Resources for Food and Agriculture covers plant genetic resources for all plant species for food and agriculture.
- This includes species in Annex 1 and outside Annex 1
- Ideally Annex 1 would include all species for food and agriculture. The Annex was supposed to be based on food security and interdependence. Soybeans, tomatoes and flax are a glaring omissions.
- Parties can set whatever terms they wish for access to non-Annex 1 GRs as long as they are compatible with the rest of the Treaty.
- Many countries and the IARC's use a Material Transfer Agreement for non-Annex 1 crops which is almost identical to the standard MTA used for Annex 1 crops



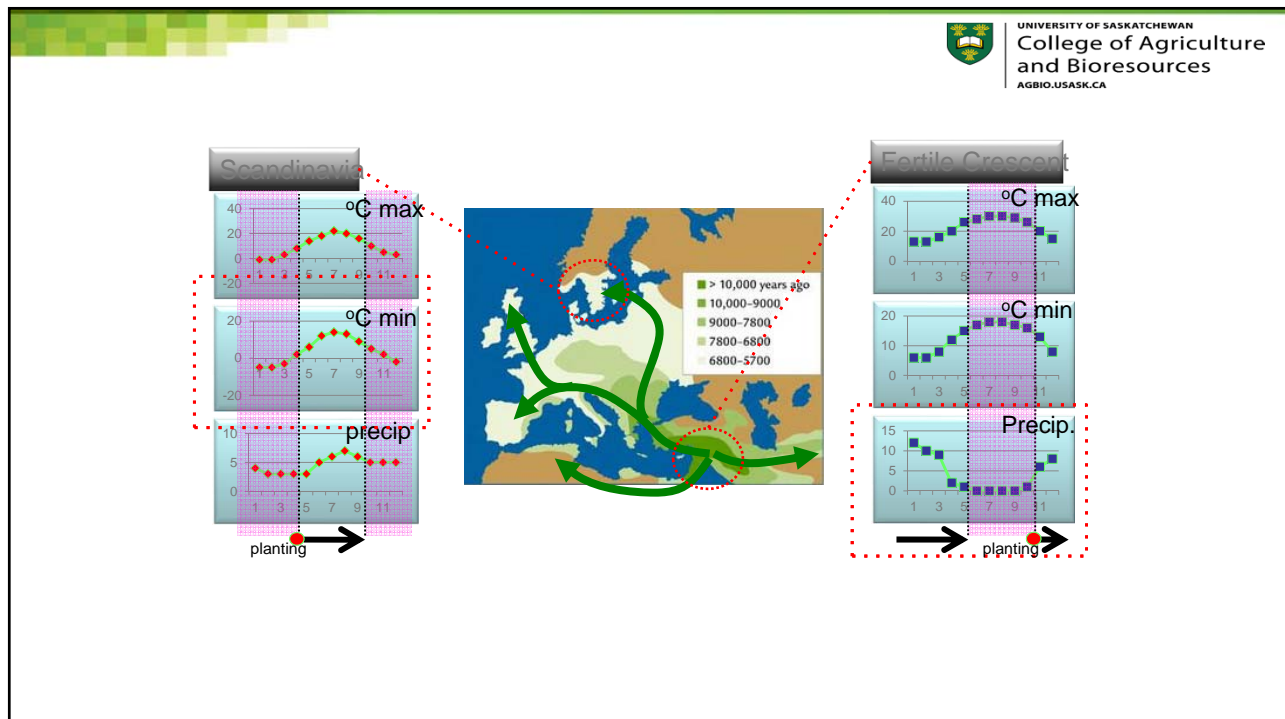
Treaty Background

- “Convinced of the special nature of plant genetic resources for food and agriculture, their distinctive features and problems needing distinctive solutions”
- “Cognizant that plant genetic resources for food and agriculture are a common concern of all countries, in that all countries depend very largely on plant genetic resources for food and agriculture that originated elsewhere”



No Country is self sufficient

- Ireland without potatoes
- Italy without tomatoes
- Brazil without soybeans
- Colombia without coffee
- China without maize
- Nigeria without cassava
- Canada without canola
- USA without wheat





Spread of Barley

- Note that the genotypes in the remote areas of spread are very different from those in the region of original cultivation and also from each other.
- Spread took place over thousands of years
- Spread by migrating people each along the way incrementally adding to the genetic variation and adaptation
- One could not single out any group of these peoples who have contributed more than any other
- Thus one has to ensure that all benefits arising from the use of genetic resources are shared equitably and promote agricultural progress for all growers and society at large.



Attribution

- It is very difficult if not impossible to determine where or when a particular trait or set of traits arose in germplasm. Thus impossible to single out a country to make a payment to for their use. Many have contributed over the millennia.
- It is easy however to identify the country providing a sample of genetic resources.
- Thus the Treaty has focused on multilateral measures, the multilateral system, the SMTA and the creation of the Treaty's benefit sharing fund which is targeted to support plant genetic resource conservation and characterization from which everyone can ultimately benefit



Benefits

- The primary benefit of PGRFA is in their use to create improved varieties
- This requires access to these improved varieties by farmers
- This requires access to the genetic resources by plant breeders and other researchers
- The commercial return on investment margins of plant breeding programs are very narrow compared for example to the pharmaceutical sector
- Anything that hinders either access is a detriment to the realization of benefits



UPOV Mission

- To provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants for the benefit of society.



UPOV

- The UPOV agreements recognize the special nature of plant varieties
- All varieties are built on the basis of preceding genotypes
- Plants are self reproducing
- Protection is needed in order to recognize the creative contributions of plant breeders and to facilitate the generation of funds which in turn pay for the breeding programs of both public and private sector institutions
- In return protected varieties are freely available for further breeding and research with or without the permission of the right holder.
- Utility patents are not well suited to the protection of plant varieties. Too restrictive. Holder has exclusive rights over the use, no breeder or research exemption.



Farmers Rights

- Set out in the Treaty. The responsibility for realizing Farmer's Rights rests with national governments.
- Reasonable to expect that all farmers, all of whom have contributed over the generations, should benefit from their use
- Use of farm saved seed for own use is viewed by some as the most important benefit.
- Many farmers would not agree. Access to a continuous flow of improved varieties is more important.
- Article 15(2) of UPOV'91 does provide contracting members flexibility to allow farmers to use farm saved seed for their own use. It does not permit sale of saved seed for seed purposes. Each member country can tailor their PBR legislation to address their unique circumstances.
- Many countries involve farmers in policy development for GR acquisition and management, for variety registration and plant variety protection legislation. Thus these regimes can take farmers needs into account.



Farmers Rights

- Art 9.3 “Nothing in this Article shall be interpreted to limit any rights that farmers have to save , use exchange and sell farm saved seed/propagating material, subject to national law as appropriate.”
- Countries which are members of UPOV have national laws which do place some, appropriate, restrictions on the use of farm saved seed
- The Treaty recognizes this and thus sanctions it.



Benefits

- As stated previously the greatest benefit is the use of the resources in variety development putting improved varieties in the hands of farmers
- The SMTA does provide for payment where PGRFA from the Treaty are used to develop new varieties.(many use a similar MTA for non Annex 1 crops). Given the 10 year time lag in variety development and the fact that some countries did not start using the SMTA until years after the Treaty adoption it is not surprising that payments have been slow so far but they are expected to increase.
- Payment is not compulsory if the varieties are freely available for further breeding and research as is the case where varieties are protected by Plant Breeder’s Rights
- A number of organizations also make voluntary contributions to the fund
- Many national organizations contribute large amounts of in kind assistance to gene banks by characterizing the resources, by increasing seed of gene bank entries and by training staff



Benefits

- International organizations such as the CGIAR Centers also carry a large load in conserving genetic resources of many major food crops, important to developing countries. They also characterize these resources and make them freely available. The Centers play a significant role in training staff for gene banks.
- The Centers also play an important role in pre-breeding, incorporating valuable traits into a range of genetic backgrounds
- These centers are financially supported by development aid from many countries around the world



Benefits

- The contributions of international aid agencies and philanthropic organizations from many countries have been used for decades to support the conservation, sustainable use and benefit sharing of PGRFA.
- These contributions have been made to developing countries some of which are centres of origin or centres of crop diversity



Conclusions

- Achieving the goals of the Global Plan of Action requires, amongst other things, a tremendous effort by all plant breeders to produce new and improved varieties of all crops for all farmers worldwide
- The Treaty and UPOV are complementary to each other. Both recognize and support the critical importance of plant genetic resources for food and agriculture and their special nature.
- Realization of the primary benefit of PGRFA, improved variety development, is supported by the Treaty and the viability of breeding programs is supported by UPOV compliant protection regimes.
- UPOV agreements provide for farmers to save seed for their own use and allow free use of protected varieties for further research and breeding



Conclusions

- There is a need to expand the crops in Annex 1 to eventually include all crops of importance for food production. That will enhance the use of these resources and enhance the benefits.
- It may be useful to revise the terms of the standard Material Transfer agreement to make payments value based and with clear termination clauses.
- SMTA payments and a variety of National and International funds assist in the preservation and characterization of PGRFA especially in developing countries.
- Working together co-operatively focusing on important issues will do wonders for what we all want: A secure supply of safe and nutritious food for all and a viable livelihood for farmers everywhere.

