An Overview of the Provisions of the International Treaty on Plant Genetic Resources for Food and Agriculture

(Presentation 1, Part 2)

Introduction

The International Treaty on Plant Genetic Resources for Food and Agriculture (hereinafter ‘the Treaty’) contains 35 articles and two annexes. While the scope of the Treaty is comprehensive, covering all plant genetic resources for food and agriculture, the multilateral system of access and benefit-sharing covers only specific crops.

What are the major changes the Treaty will bring?

- It should help reduce international tensions around the transfer and use of plant genetic resources for food and agriculture (PGRFA) and, thus, should facilitate collection and exchange. This, in turn, will create an enabling environment for research and the development of more productive and resilient crop varieties.

- Access to PGRFA of crops that are included within the Treaty’s multilateral system should become increasingly routine and easy: ‘facilitated’ in the language of the Treaty. Access to materials of other crops not included in the multilateral system will likely remain more difficult, as the conditions for the exchange of materials will still need to be negotiated bilaterally with the country providing the access.

- Access to PGRFA that are part of the multilateral system is provided under terms specified in the so-called standard material transfer agreement\(^1\) (SMTA), which was adopted by the governing body at its first session in 2006. The SMTA defines terms for the transfer of PGRFA between a provider and a recipient, and binds the recipient of PGRFA (and subsequent recipients) to certain benefit-sharing arrangements in specifically defined circumstances (see the section on benefit sharing, below).

- By recognizing the ongoing efforts of farmers and their contribution to the development, conservation and sustainable use of crop varieties over millennia, the Treaty gives governments a framework and guidance on how to implement farmers’ rights at the national level, and constitutes a basis for advocating their implementation. Responsibility for the realization of farmers’ rights lies with national governments.

This presentation begins with Part IV of the Treaty, which establishes the multilateral system. Following a detailed examination of the articles on access and benefit sharing, we will discuss the scope of the Treaty (i.e., what crops and which materials it covers). Then, we will briefly look at the remaining elements of the Treaty and conclude by identifying some ambiguities that still need to be addressed.

\(^1\) See the section on access, below, for an analysis of the SMTA.
The multilateral system: Access and benefit sharing

Overview

The Treaty establishes a multilateral system with rules for access and benefit sharing for genetic material and associated information on a specific list of crops. Access is provided to both *ex situ* and *in situ* materials for the purpose of research, breeding and training. Access to PGRFA under development is at the discretion of the developer during the period of development. The multilateral system does not cover access for purposes that are not related to food and agriculture. Access must respect existing intellectual property rights (IPRs), but IPRs may not be claimed over material accessed from the multilateral system if that would limit facilitated access by others to that material ‘in the form received’ from the system. Facilitated access to PGRFA will be provided under the terms of an SMTA. Monetary benefit sharing in the form of a payment into the so-called ‘benefit-sharing fund’ is mandatory when genetic material from the system is used to produce a ‘product that is a PGRFA’ (e.g., a line or cultivar) that is commercialized and the availability of that product for further research and development is restricted. In effect, some forms of patenting will trigger the benefit-sharing mechanism; plant breeders’ rights probably will not. The monies that accumulate in the benefit-sharing fund will be used to support high-impact projects for the conservation and sustainable use of PGRFA, focusing on food security and adaptation to climate change, primarily in developing countries.

Part IV of the Treaty is entitled ‘The Multilateral System of Access and Benefit-sharing’ (i.e., the multilateral system). Part IV contains Article 10, which establishes the multilateral system, as well as specific articles on coverage, access and benefit sharing.

10.1 In their relationships with other States, the Contracting Parties recognize the sovereign rights of States over their own plant genetic resources for food and agriculture, including that the authority to determine access to those resources rests with national governments and is subject to national legislation.

10.2 In the exercise of their sovereign rights, the Contracting Parties agree to establish a multilateral system, which is efficient, effective and transparent, both to facilitate access to plant genetic resources for food and agriculture, and to share, in a fair and equitable way, the benefits arising from the utilization of these resources, on a complementary and mutually reinforcing basis.

In Article 10, Contracting Parties\(^2\) specifically assert that they are establishing the multilateral system in the exercise of their sovereign rights over their PGRFA—rights that are recognized in the Convention on Biodiversity (CBD). This article thus provides a link with the CBD and makes it clear that the rules that govern access and benefit sharing for the multilateral system are, in fact, in line with the concept of ‘mutually agreed terms’ referred to in the CBD. The terms for the transfer of PGRFA under the multilateral system are, in fact, terms that have been mutually agreed upon on a multilateral basis among Contracting Parties to the Treaty.

Leaving aside Article 11 on coverage for the moment, we shall begin our detailed analysis with Article 12, which addresses the topic of access to PGRFA within the multilateral system.

Access

Access is guaranteed in the following paragraphs:

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\(^2\) The term ‘Contracting Parties’ is used in the Treaty to denote countries that have formally ratified the Treaty.
12.1 The Contracting Parties agree that facilitated access to plant genetic resources for food and agriculture under the Multilateral System, as defined in Article 11, shall be in accordance with the provisions of this International Treaty.

12.2 The Contracting Parties agree to take the necessary legal or other appropriate measures to provide such access to other Contracting Parties through the Multilateral System. To this effect, such access shall also be provided to legal and natural persons under the jurisdiction of any Contracting Party, subject to the provisions of Article 11.4.

12.3 Such access shall be provided in accordance with the conditions below:

12.3(a) Access shall be provided solely for the purpose of utilization and conservation for research, breeding and training for food and agriculture, provided that such purpose does not include chemical, pharmaceutical and/or other non-food/feed industrial uses. In the case of multiple-use crops (food and non-food), their importance for food security should be the determinant for their inclusion in the Multilateral System and availability for facilitated access.

Article 12.2 notes that facilitated access shall be provided to Contracting Parties, as well as to ‘legal and natural persons’ under the jurisdiction of any Contracting Party. This means that individuals and institutions or organizations that have a ‘legal personality’, such as private companies and nongovernmental organizations (NGOs), also have the right to access the material contained in the multilateral system.

Article 12.3 lays out the conditions under which facilitated access is granted. It is specifically granted for ‘research, breeding and training for food and agriculture’. Access for other purposes, such as access for commercial, pharmaceutical or chemical uses, is not covered by the Treaty, meaning that those seeking access for such purposes will need to make separate arrangements. In most cases, access for such other uses will effectively fall under the framework of the CBD.

Paragraphs 12.3(b) through (h) specify the conditions under which access is to be provided and identify circumstances under which access to PGRFA or associated information may be denied legitimately:

12.3(b) Access shall be accorded expeditiously, without the need to track individual accessions and free of charge, or, when a fee is charged, it shall not exceed the minimal cost involved;

12.3(c) All available passport data and, subject to applicable law, any other associated available non-confidential descriptive information, shall be made available with the plant genetic resources for food and agriculture provided;

12.3(d) Recipients shall not claim any intellectual property or other rights that limit the facilitated access to the plant genetic resources for food and agriculture, or their genetic parts or components, in the form received from the Multilateral System;

12.3(e) Access to plant genetic resources for food and agriculture under development, including material being developed by farmers, shall be at the discretion of its developer, during the period of its development;

12.3(f) Access to plant genetic resources for food and agriculture protected by intellectual and other property rights shall be consistent with relevant international agreements, and with relevant national laws;
12.3(g) Plant genetic resources for food and agriculture accessed under the Multilateral System and conserved shall continue to be made available to the Multilateral System by the recipients of those plant genetic resources for food and agriculture, under the terms of this International Treaty; and

12.3(h) Without prejudice to the other provisions under this Article, the Contracting Parties agree that access to plant genetic resources for food and agriculture found in in situ conditions will be provided according to national legislation or, in the absence of such legislation, in accordance with such standards as may be set by the Governing Body.

These paragraphs are critical to the functioning of the multilateral system. In general, they acknowledge the applicability of intellectual and other property rights over the material. They call for Contracting Parties to make available not just the genetic material, but also associated, descriptive (i.e., non-proprietary) information.

Paragraph (b) specifies that those providing genetic resources need not track individual accessions. Access has to be accorded quickly and free of charge, although the possibility of charging administrative fees to cover the minimal costs involved is allowed.

Paragraph (c) provides that available passport data and other associated non-confidential descriptive information are to be made available.

Paragraph (d) is a key one in trying to define the extent to which IPRs can be applied to material accessed from the multilateral system. However, it contains a number of ambiguities and is open to interpretation, in part because key terms employed in this paragraph are not defined. Some of these ambiguities and possible interpretations will be explored further in Handout 8 (on open issues and concerns).

Paragraph (g) specifies that materials accessed should continue to remain available to the multilateral system from the recipient (as long as the recipient has them).

Paragraph (h) confirms that access will also be provided to materials found in in situ conditions, although such access is to be provided according to national legislation. It is assumed that this national legislation deals with the mechanics of implementation, including terms and conditions for collecting expeditions—without establishing new requirements or conditions that are inconsistent with the Treaty. National legislation pertaining to in situ materials must allow for access if this provision is to be ‘without prejudice to the other provisions under this Article’, as the paragraph states, provided of course that the material is in the multilateral system (i.e., under the management and control of the Contracting Party and in the public domain).

As with proprietary information, Article 12 provides some exceptions to the kinds of genetic materials that must be made available, and when: Contracting Parties and centres need not make genetic material ‘under development’ available during its period of development.

Paragraph (e) provides that access to PGRFA under development is at the discretion of the developer during the period of its development. This includes material being developed by farmers. In other words, it is up to the developer to decide whether or not the material should be released and when.

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3 Countries were concerned, for instance, with the modalities of access to materials in national parks and other protected or vulnerable areas.
While the intention of paragraph (e) may be reasonably clear, the wording of this provision is problematic in that it does not specify what ‘under development’ means, nor does it define when the ‘period’ of development ends. The concept of PGRFA under development has been defined more closely in the SMTA adopted by the governing body at its first session in 2006. See Handout 24 (on the SMTA).

Paragraph (f) specifies that materials protected by IPRs will be made available in a manner consistent with those rights. The multilateral system can include material that is protected by IPRs, provided that these rights are not inconsistent with the multilateral system. PGRFA are, of course, included automatically in the multilateral system if they are in the public domain, so this provision really refers only to material included voluntarily in the multilateral system. If such material is so included, then IPRs like plant breeders’ rights, would need to be respected. Some other IPRs, like patents, could be inconsistent with the multilateral system, and such material would presumably not be included in it.

None of the paragraphs makes specific reference to practical implementation points such as whether there is an obligation to transfer diseased materials in contradiction of quarantine laws and regulations (presumably there is not).  

Paragraph 12.4 mandates the use of a standard material transfer agreement—a system very similar to that used by centres in the Consultative Group on International Agricultural Research (CGIAR) under the 1994 agreements with the Food and Agriculture Organization of the United Nations (FAO). The SMTA binds the recipient of Annex I PGRFA to certain conditions and requires the recipient to pass on these obligations to any subsequent recipient. Both the ‘software’ approach (known as the ‘shrink-wrap’ form of contract acceptance) and the ‘click-wrap’ form of acceptance (the form used when purchasing goods or downloading software on the internet) can be used, in addition to the traditional mode of signature, in accordance with the preference of the parties to the SMTA.

12.4 To this effect, facilitated access, in accordance with Articles 12.2 and 12.3 above, shall be provided pursuant to a standard material transfer agreement (MTA), which shall be adopted by the Governing Body and contain the provisions of Articles 12.3(a), (d) and (g), as well as the benefit-sharing provisions set forth in Article 13.2(d)(ii) and other relevant provisions of this International Treaty, and the provision that the recipient of the

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4 The international centres made it clear in their statement (issued at the time of signature of the agreements with the governing body, bringing their collections within the purview of the Treaty) that it was their understanding that there would be no such obligation.

5 These agreements brought the important collections held by the CG Centres (over 650,000 accessions) under the auspices of FAO as part of the international network of ex situ collections. The agreements recognized that the collections were held ‘in trust’ for the benefit of the international community and should be made available for the purpose of scientific research, plant breeding and conservation of genetic resources without restriction. Recipients (and the CG Centres) were not entitled to claim ownership or intellectual property rights over the material. Material was to be transferred under a material transfer agreement.

6 The ‘shrink-wrap’ approach is where the opening of the wrapping in which the germplasm sample is sent and the use of the germplasm is deemed to constitute acceptance of the SMTA.

7 The ‘click-wrap’ approach is where the agreement is concluded on the internet and the recipient accepts the terms and conditions by clicking on the appropriate icon on the website or in the electronic version of the agreement as appropriate.

8 During the negotiations of the text of the SMTA, CGIAR representatives argued that the obligation to sign MTAs raises the following problems:
   a. it adds to the bureaucracy of implementation;
   b. it provides no additional or significant legal advantages, and recourse to the courts is rarely the route taken in cases of infringement, in any case; and
   c. the procedures involved in obtaining signatures in many countries result in inhibiting flows of germplasm.
plant genetic resources for food and agriculture shall require that the conditions of the MTA shall apply to the transfer of plant genetic resources for food and agriculture to another person or entity, as well as to any subsequent transfers of those plant genetic resources for food and agriculture.

The precise content of the SMTA, and thus both the ‘formula’ for monetary benefit sharing and the procedures for administering the SMTAs, is not specified by the Treaty. These matters were left to the governing body to decide. Article 13 on benefit sharing specifies that the ‘form and manner of payment’ will be determined ‘in line with commercial practice’ by the governing body at its first meeting. The governing body took all these decisions when it adopted the SMTA at its first session in 2006. It is important to point out that these decisions, like all decisions taken by the governing body, had to be taken by consensus.

12.5 Contracting Parties shall ensure that an opportunity to seek recourse is available, consistent with applicable jurisdictional requirements, under their legal systems, in case of contractual disputes arising under such MTAs, recognizing that obligations arising under such MTAs rest exclusively with the parties to those MTAs.

12.6 In emergency disaster situations, the Contracting Parties agree to provide facilitated access to appropriate plant genetic resources for food and agriculture in the Multilateral System for the purpose of contributing to the re-establishment of agricultural systems, in cooperation with disaster relief coordinators.

Paragraph 12.5 simply states that Contracting Parties will ensure that there is some mechanism in their legal system for addressing violations of the SMTA. It should be noted that the Treaty does not specify the legal jurisdiction applicable to the SMTA. Often, contracts such as MTAs would do this, saying, for example, that in the case of a dispute, the relevant laws of a named country would apply. In the SMTA adopted by the governing body, the applicable law is stated as being General Principles of Law, including the UNIDROIT Principles of International Commercial Contracts 2004, the objectives and provisions of the Treaty and, when necessary for interpretation, the decisions of the governing body. The SMTA also specifies international arbitration under the Rules of Arbitration of the International Chamber of Commerce as the final method of settling disputes, with arbitral awards to be binding. This is perfectly compatible with the provisions of Paragraph 12.5, given that arbitral awards may still need to be enforced in national courts, although the national courts would not normally be expected to reopen the substance of the arbitration. (For more details on the SMTA see Handout 24.) Paragraph 12.5 is tied to Article 21 on compliance. Article 21 provides for legal assistance and advice to be made available, presumably by the governing body.

Paragraph 12.6 provides for the provision of materials needed to restore agricultural systems in disaster situations, regardless of whether the recipients are Contracting Parties to the Treaty or not. This paragraph was drafted in support of the Global Plan of Action, which has an ‘activity’ devoted to this issue.

**Benefit sharing**

The Treaty’s provisions on benefit sharing contained in Article 13 recognize that access itself is a major benefit of the multilateral system and states that benefits arising from the use of PGRFA under the multilateral system should be shared fairly and equitably through a number of mechanisms, both voluntary and mandatory in nature.

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9 Unless, by consensus, they decide on another method.
Contracting Parties agree, for example, to provide each other with and/or facilitate access to technologies for the conservation, characterization, evaluation and use of plant genetic resources. This particular paragraph, 13.2.(b)(i), encourages the transfer of technologies, including those that are essentially ‘embedded’ in genetic materials. Where the technology is in the hands of the government sector, the government concerned is required to provide access to it. But where it is in the hands of the private sector, as so often is the case, the obligation is more to facilitate access. Access to technology must respect applicable property rights. The governing body may need to provide more guidance on how such transfers of technology from the private sector can be facilitated.

Likewise, the requirements of Article 13, with respect to capacity building in developing countries and countries with economies in transition, also lack a degree of enforceable precision. Elements identified in the article include training, strengthening of facilities and the carrying out of research in these countries.

13.2(a) The Contracting Parties agree to make available information which shall, inter alia, encompass catalogues and inventories, information on technologies, results of technical, scientific and socioeconomic research, including characterization, evaluation and utilization, regarding those plant genetic resources for food and agriculture under the Multilateral System. Such information shall be made available, where non-confidential, subject to applicable law and in accordance with national capabilities. Such information shall be made available to all Contracting Parties to this Treaty through the information system, provided for in Article 17.

Confidential and proprietary information is not covered by this mandatory requirement, and all transfers are contingent on and subject to any relevant intellectual property rights.

Article 13.2(d)(ii) is arguably the most interesting and controversial provision related to benefit sharing under the Treaty. This paragraph lays out a mandatory benefit-sharing scheme connected to the commercialization of PGRFA that incorporates materials from the multilateral system. The benefit-sharing requirement is now incorporated into the SMTA adopted by the governing body at its first session in June 2006 and will bind those who receive germplasm from the system to providing monetary benefits in certain circumstances.

13.2(d)(ii) The Contracting Parties agree that the standard Material Transfer Agreement referred to in Article 12.4 shall include a requirement that a recipient who commercializes a product that is a plant genetic resource for food and agriculture and that incorporates material accessed from the Multilateral System, shall pay to the mechanism referred to in Article 19.3(f), an equitable share of the benefits arising from the commercialization of that product, except whenever such a product is available without restriction to others for further research and breeding, in which case the recipient who commercializes shall be encouraged to make such payment.

The Governing Body shall, at its first meeting, determine the level, form and manner of the payment, in line with commercial practice. The Governing Body may decide to establish different levels of payment for various categories of recipients who commercialize such products; it may also decide on the need to exempt from such payments small-scale farmers in developing countries and in countries with economies in transition. The Governing Body may, from time to time, review the levels of payment with a view to achieving fair and equitable sharing of benefits, and it may also assess, within a period of five years from the entry into force of this Treaty, whether the mandatory payment requirement in the MTA shall apply also in cases where such commercialized products are available without restriction to others for further research and breeding.
When a recipient receives material from the multilateral system and uses that material to produce a commercial product that ‘is a plant genetic resource for food and agriculture’, and if the recipient then chooses to restrict the availability of that product for further research and breeding, by for example taking out patent protection over that product, then the recipient will be obliged to pay ‘an equitable share of the benefits arising from the commercialization of that product’. This requirement, it should be understood, will not apply to the commercialization of a commodity, such as bread containing wheat produced by a variety incorporating material obtained from the multilateral system. The requirement will, however, apply to the variety—to the plant genetic resource—that has been commercialized.

As required by Article 13.2(d)(ii), the ‘level, form and manner of the payment’ was determined by the governing body, at its first meeting, ‘in line with commercial practice’ and is included in an Annex to the SMTA (see Handout 24). The payment is made into a fund established at FAO and controlled by the governing body. This fund, generally referred to as the ‘benefit-sharing fund’, is used to support activities consistent with the goals of the Treaty, taking into consideration the Global Plan of Action (GPA). According to the Treaty, the benefits should flow ‘primarily, directly and indirectly, to farmers in all countries, especially in developing countries and countries with economies in transition, who conserve and sustainably utilize’ PGRFA. The governing body, as required under Article 13.4, adopted ‘relevant policy and criteria for specific assistance’ at its first session in the framework of the Funding Strategy for the International Treaty.

The exception to the requirement to make a monetary payment is when the product (for example, a new crop variety) is made available ‘without restriction to others for further research and breeding’. In such a case, no payment is required, though it is encouraged. In practice, this means that varieties incorporating material from the multilateral system that are protected by UPOV-style plant breeders’ rights will not be subject to mandatory, monetary benefit sharing. Why? Because such varieties are freely available for further research and breeding. Varieties and other materials that are protected by utility patents may well be subject to the benefit-sharing requirement, however, because patent laws in a number of countries restrict the use of the patented invention for research as well as for use as a breeding material.

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10 The GPA was adopted by the International Technical Conference on Plant Genetic Resources held in Leipzig, Germany in 1996. The GPA, which is not legally binding, lists 20 agreed priority activity areas, organized into four main groups: (a) in situ conservation and development, (b) ex situ conservation, (c) utilization of PGRFA and (d) institutions and capacity building. A rolling plan of action recognized as a supporting component under Article 14 of the Treaty, the GPA is now in the process of being updated.

11 Patent protection differs from country to country. You will need to seek legal advice on the situation in your own country. The following general review is of course subject to that proviso. As a general rule, US utility patents will restrict availability for further research and breeding, unless of course the patent holder undertakes to issue free licences to whoever wishes to use the patented product for research or breeding. On the other hand, patents under the US Plant Patent Act cover only asexually reproduced plants and thus would not restrict availability for breeding. As a general rule in Europe, patents do not restrict availability for research. France and Germany have new legislation that extends this exemption to breeding, though commercialization of the products of breeding is still restricted. Switzerland is considering adopting similar legislation. Netherlands and UK patents still don’t provide for a breeding exemption. Patent protection in Japan does not cover acts carried out for the purpose of experiment or research; however, it would restrict availability for commercial breeding. There is also an ‘experimental use’ exemption under the patent law in Australia, but again, this would not extend to commercial breeding. The situation is similar in New Zealand, although there, the ‘experimental use’ exemption is based on judicial practice rather than legislation. Note that just patenting a variety will not trigger mandatory payments. The trigger is when the variety is commercialized.
As the second paragraph of 13.2(d)(ii) notes, the governing body may elect to establish different levels of payments for different categories of users that commercialize products covered by this article. It may review the level of payments from time to time. It may also assess whether the system of mandatory payments should be extended to cover products that are available without restriction for further research and breeding. This assessment is supposed to take place within a period of five years from the date of the Treaty coming into force. So far, no such assessment has yet taken place.

Finally, contracting parties have agreed (in Article 13.6) that at some unspecified point in the future, ‘modalities of a strategy of voluntary benefit-sharing contributions’ from food-processing industries will be considered.

The coverage of the multilateral system

Overview

The multilateral system covers PGRFA that are in the public domain and under the management and control of the Contracting Parties. To date, 35 of the most important crops and 29 forages, which together represent 80% of the food we derive from plants, are governed by the provisions of the multilateral system. A number of important crops, though, have not yet been included: soya bean, groundnut, sugarcane, tomato and most tropical forages are, at the moment, excluded from the system. Certain species that are part of the gene pool used by breeders of cassava, potato and common beans are also excluded.

The multilateral system includes all PGRFA ‘listed in Annex I that are under the management and control of the Contracting Parties and in the public domain’ (Article 11.2). In addition, Contracting Parties agree to encourage the private sector and other relevant organizations within their jurisdiction to include Annex 1 materials they hold in the multilateral system. A number of nongovernmental institutions have already informed the governing body about such voluntary inclusions at its third meeting. The governing body is required to assess the progress in getting such materials into the multilateral system and to decide whether facilitated access shall continue to be granted to those individuals and institutions that have failed to place their PGRFA collections in the system. Due to a lack of adequate information, though, the governing body has decided to postpone a proper assessment of inclusions by natural and legal persons under the jurisdiction of Contracting Parties until its fourth meeting.

What do ‘public domain’ and ‘under the management and control’ mean? The expression ‘under the management and control’ of a Contracting Party is a factual as well as a legal qualification. If the collection is actually managed and controlled by the Contracting Party, then the qualification is met. If the collection is managed and controlled by a separate entity over which the Contracting Party does not have any control, then the qualification is not met. The issue becomes more debatable in the case of quasi-autonomous public research institutes and genebanks under state or provincial control under federal systems. For the most part, PGRFA held in such institutes and genebanks do not automatically become part of the multilateral system and might need to be brought within the multilateral system with the consent of the institute or genebank concerned.

The meaning of the expression ‘public domain’ is also not self-explanatory. In most common-law countries, the expression appears to mean ‘free of intellectual and other property rights’, and this seems to be the preferred meaning. But the expression could also be understood as
meaning ‘owned by the State’, and in some countries, particularly in Latin America, this seems to be the preferred interpretation.

The coverage of Annex I was debated extensively and vigorously during the negotiation of the Treaty. Early on, delegates agreed in principle that crops included in the multilateral system would be those most important for food security and for which countries were most interdependent. Such criteria, as valid as they might be, did not provide a straightforward and air-tight formula for inclusion, and thus the selection of crops from beginning to end was highly politicized. Annex I lists some 35 crops (or in the case of brassicas, crop complexes) and a number of forages.

In addition to the problem of which crops to include, negotiators faced the related problem of how to define each crop in operational terms in order to be able to define precisely what was in and what was out. For example, there was never any doubt that wheat would be included in the multilateral system. But, what exactly does ‘wheat’ really mean? IPGRI (now operating under the name Bioversity International) assisted in organizing panels of experts to provide scientific information on these and other questions, including, for example, the importance of forages for food security. But the advice of the experts was not always heeded. In the end, negotiators defined crops (often as much on the basis of political as scientific criteria) by genus/genera, noting whenever a particular genus or species was excluded.

In some cases, negotiators decided to exclude specific species associated with a crop, and in some cases, the excluded species are those typically considered part of the gene pool that a breeder might use or want access to. Two examples would be Phaseolus polyanthus and Solanum phureja. The definition of cassava specifies Manihot esculenta only; thus wild relatives now being used to increase protein content and improve disease resistance are excluded. Finally, some definitions are simply ambiguous. For example, wheat is defined as ‘Triticum et al.’

Legally speaking, the scope of the multilateral system is limited to the crops and forages included in Annex I of the Treaty. However, in practical terms, the conditions of access and benefit sharing of the multilateral system have been extended to species outside of Annex I, in the following ways:

- Some Contracting Parties, like the Netherlands, the Nordic countries and Switzerland, have decided to use the SMTA for transfers of PGRFA of non-Annex 1 crops as well as Annex 1 material under the management and control of the government. Nothing in the Treaty prevents Contracting Parties from doing this.12

- CGIAR Centres and other international institutions that have signed agreements with the governing body distribute non-Annex I materials collected before the entry into force of the Treaty under the SMTA, as authorized by the governing body at its second session. More details are provided below.

The use of the SMTA for non-Annex I materials results in the application of multilateral access and benefit-sharing conditions defined by the Treaty to these materials.

12 The member countries of the European Cooperative Programme for Plant Genetic Resources (ECPGR) have recently adopted a memorandum of understanding establishing a European Genebank Integrated System (AEGIS) under which the SMTA would also be used for transfers of European accessions of non-Annex 1 as well as Annex 1 crops.
An extension of Annex I, and thereby of the coverage of the multilateral system, is of course possible in principle. It would again, of course, have to be agreed to by the governing body, which means that the Contracting Parties would have to decide on it by consensus. Without attempting to guess the likelihood of this happening, one can assume that such an extension would be subject to very long and difficult negotiations.

Additions (and exclusions) to Annex I can be made by the governing body—by consensus. In all likelihood, the list of crops is ‘fixed’ for some time.

**General provisions of the Treaty**

The foregoing analysis has focused on the Treaty’s establishment of a multilateral system for access and benefit sharing. The Treaty, however, also contains a number of important provisions, such as those on the conservation and sustainable use of PGRFA, farmers’ rights and the funding strategy, as well as a number of provisions dealing with institutional matters mainly related to the governance of the Treaty. Below, we provide a very brief description of the remaining articles.

**Preamble**

The Preamble notes the importance of PGRFA and recognizes the contributions farmers have made in conserving and making available these resources. It describes the GPA as the internationally agreed-upon framework for PGRFA-related activities. Significantly, the Preamble affirms that the Treaty does not imply a change in the rights or obligations of Parties under other international agreements, and states that this is not meant to imply a hierarchy between the Treaty and other agreements. Finally, the Preamble notes that the Treaty will be within the framework of FAO and will operate under Article XIV of the FAO Constitution. 13

**Article 1. Objectives**

The objectives are the conservation and sustainable use of PGRFA and the fair and equitable sharing of benefits arising out of their use for sustainable agriculture and food security. The objectives are to be pursued in harmony with the CBD.

**Article 2. Use of Terms**

Eight terms are defined. Most of the definitions are derived from those found in the CBD. In the final days of the negotiations, there was considerable debate over the definitions, focusing mainly on whether ‘genetic parts and components’ should be included in the definition of ‘plant genetic resources’. In the end, the definitions used stuck closely to those used in the CBD, and the term ‘genetic parts and components’ was moved to Article 12.3(d), dealing with IPRs.

Finally, it should be noted that some important terms are not defined in Article 2 and therefore might eventually need to be addressed by the governing body. The best example of this involves a term used in Article 12.3(d), which states: ‘Recipients shall not claim any intellectual property or other rights that limit the facilitated access to the plant genetic resources for food and agriculture, or their genetic parts or components, in the form received from the multilateral system.’ The term ‘genetic parts or components’ is not defined, nor is the term ‘in the form received’.

13 Article XIV of the FAO Constitution provides a mechanism whereby the FAO Conference can adopt treaties and other international agreements which can then be opened for signature and ratification by FAO Member Nations and, if so specified in the agreements themselves, by other States.
**Article 3. Scope**
It is important to note that the Treaty does not cover just the crops in the multilateral system, which are dealt with in Part IV of the Treaty. In fact, the scope of the Treaty covers all PGRFA. Other articles, for example those on conservation and sustainable use, international cooperation, the GPA, networks, the Global Information System and the funding strategy, are not limited to the crops that fall under the multilateral system.

**Article 4. General Obligations**
Parties must ensure that their laws and regulations conform to the obligations laid out in the Treaty.

**Article 5. Conservation, Exploration, Collection, Characterization, Evaluation and Documentation of PGRFA**
The provisions of Article 5 and 6 are central to the Treaty and provide a modern framework for action on the conservation and sustainable use of PGRFA. The provisions expand and modernize the earlier provisions of the International Undertaking and develop a PGRFA-oriented application of the themes set out in the CBD. They draw heavily on the priority areas identified in the GPA, which was adopted by the Leipzig International Technical Conference on Plant Genetic Resources in 1996. Article 5.1 provides for promotion of an integrated approach to the exploration, conservation and sustainable use of PGRFA and thus provides a chapeau to both article 5 and 6. The reference to ‘national legislation’ serves to stress that, even where actions are taken in cooperation with other Contracting Parties, the final decisions regarding the promotion of an integrated approach lie with the state in which the PGRFA are to be found.

Paragraphs (a) to (f) serve as important elements required to achieve the goals established in this Article, focusing on three fundamental conservation methods: on-farm conservation, *in situ* conservation and *ex situ* conservation. They also identify other steps involved in the conservation of PGRFA, including surveying and inventorying, collection and monitoring. The provisions of paragraph (e), which call for the development of an efficient and sustainable system of *ex situ* conservation, mirror the provisions of the GPA on this point and form a focus for the funding action being taken by the Global Crop Diversity Trust.

**Article 6. Sustainable Use of PGRFA**
Contracting Parties commit to developing appropriate policy and legal measures to promote the sustainable use of PGRFA. Again drawing on the priority areas established under the GPA, the article provides examples of what these measures may include: policies promoting diverse farming systems (‘as appropriate’), strengthening of research that enhances and conserves biological diversity by maximizing intra- and inter-specific variation for the benefit of farmers, promoting plant breeding efforts (including participatory plant breeding), broadening the genetic base of crops, expanding the use of local and locally adapted crops and varieties (‘as appropriate’), supporting the use of diversity in on-farm management, and reviewing breeding strategies and regulations regarding variety release and seed distribution, etc. As with many other articles, this article contains no specific ‘enforceable’ obligations. However, it does provide a policy framework and check-list for action by Contracting Parties, and an encouragement for governments to undertake certain activities (e.g., base broadening).

**Article 7. National Commitments and International Cooperation**
Contracting Parties commit to integrating the activities referred to in Articles 5 and 6 into their agricultural and rural-development programmes. International cooperation is to be directed, in particular, to capacity building in developing countries and countries with
economies in transition, enhancing international activities, strengthening institutional arrangements and implementing the Treaty’s funding strategy.

**Article 8. Technical Assistance**
Parties agree to ‘promote the provision of technical assistance’.

**Article 9. Farmers’ Rights**
Over time, ‘farmers’ rights’ has come to mean different things to different people. To some, it is associated with a desire for a form of intellectual property rights for farmer-developed materials; to others, it is a political slogan that leads to recognition of farmers’ contributions and more PGRFA-related activities of benefit to small, traditional farmers. Article 9, at least, settles the issue as regards the international implications of the term: Contracting Parties recognize the contribution of farmers but state that the responsibility for the realization of farmers’ rights rests with national governments.

Each Contracting Party, ‘in accordance with their needs and priorities…as appropriate, and subject to national legislation’, agrees to take measures to protect and promote farmers’ rights, including the protection of traditional knowledge, the right to participate in benefit sharing, and the right to participate in making decisions at the national level regarding PGRFA.

As with other articles described above, the formulations are rather vague and conditioned by phrases such as ‘as appropriate’. Article 9.3, for example, notes: ‘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 and as appropriate.’ In other words, if they have rights, they have them; if they don’t, they don’t.

In short, although this article recognizes farmers’ rights for the first time in an international agreement, it falls short of setting out binding obligations at the international level: the responsibility for realizing farmers’ rights rests with national governments. But it does clarify the various elements of farmers’ rights, and it gives governments some guidance on how to implement them, as well as providing a basis for advocating for their realization.

**Article 14. Global Plan of Action**
Contracting Parties agree to promote the effective implementation of the GPA as an international framework for PGRFA-related efforts, taking into account Article 13 on benefit sharing. The GPA is an internationally agreed plan of action adopted by the International Technical Conference on Plant Genetic Resources held in Leipzig in June 1996. It lists 20 priority activity areas for action for the conservation and utilization of PGRFA and is now in the process of being updated.

**Article 15. Ex Situ Collections of Plant Genetic Resources for Food and Agriculture Held by the International Agricultural Research Centres of the Consultative Group on International Agricultural Research and Other International Institutions**
In 1994, CGIAR Centres concluded agreements with FAO, placing collections of germplasm ‘in trust’ for the benefit of the international community, under the auspices of FAO. It was understood that these agreements were interim, pending completion of the intergovernmental negotiations on the Treaty.

Since the centres cannot become Contracting Parties to the Treaty, some legal mechanism had to be sought to ensure that the collections held by the CGIAR could be brought within the purview of the Treaty. This was done by calling on the centres, which each have their own
international legal personality, to sign agreements with the governing body of the Treaty. Such agreements, which basically reiterate the salient provisions of Article 15, were signed by all CGIAR Centres that held collections in trust on 16 October 2006. Similar agreements have also been signed with other international institutions holding important collections, such as CATIE, the Mutant Germplasm Repository of the FAO/IAEA Joint Division, the Secretariat of the Pacific Community (SPC) and two of the COGENT Centres.\textsuperscript{14}

As noted earlier, the access and benefit-sharing provisions of the Treaty apply to both Annex I and non-Annex I materials held by CGIAR Centres. Article 15 provides that non-Annex I materials will be available under the SMTA in use by the Centres as amended by the governing body of the Treaty to reflect relevant provisions of the Treaty (e.g., those concerning benefit sharing). In fact, at its second session in November 2007 the governing body decided to authorize the CG Centres to use the SMTA for non-Annex I material collected before the entry into force of the Treaty, with the addition of a series of explanatory footnotes.\textsuperscript{15}

Non-Annex I material received and conserved after the coming into force of the Treaty will be available on terms mutually agreed with the country of origin or other country that acquired them in accordance with the CBD or other applicable law. Other provisions of the Treaty relating to the Centres are similar to those previously in effect under the FAO-CGIAR ‘in trust’ agreements of 1994.

**Article 16. International Plant Genetic Resources Networks**

The Treaty calls for existing networks to be strengthened and new networks to be developed to achieve complete coverage of PGRFA. Contracting Parties agree to encourage participation by all relevant institutions: government, private sector, NGO, research and breeding, etc.

**Article 17. The Global Information System on PGRFA**

Contracting Parties agree to cooperate to develop and strengthen a global information system based on existing systems. Contracting Parties are encouraged to provide information that would allow ‘early warnings’ of hazards to PGRFA to be issued with a view to safeguarding the material. Finally, Contracting Parties agree to cooperate with the FAO Commission in making periodic reassessments of the state of the world’s PGRFA and to update the GPA.

**Article 18. Financial Resources**

Contracting Parties agree to ‘undertake to implement a funding strategy for the implementation of this Treaty’. The governing body will periodically establish a target for such funding. Contracting Parties will take steps in other international mechanisms, funds and bodies to ensure that ‘due priority and attention to the effective allocation of predictable and agreed resources’ is given to the implementation of plans and programmes under the Treaty, and Contracting Parties agree to accord due priority to PGRFA in their own plans and priorities. At its third session in June 2009, the governing body formally established the target of US$116 million for the benefit-sharing fund of the funding strategy for the five-year period June 2009 through December 2014. Voluntary contributions to the Treaty’s funding strategy are encouraged, and the governing body will consider modalities of a strategy to stimulate such contributions. Priority for funding will be given to ‘agreed plans and programmes for farmers’ in developing countries, especially in the least-developed countries and in countries with economies in transition.

\textsuperscript{14} Agreements are under negotiation with the other two COGENT Centres.

\textsuperscript{15} The import of the footnotes is merely to clarify that the references in the SMTA to the multilateral system and Annex I material are not to be interpreted as limiting the application of the SMTA to Annex I material.
Article 19. Governing Body
The governing body is made up of all the Contracting Parties, i.e., those countries that have formally ratified the Treaty or acceded to it. Countries that voted to adopt the Treaty at the FAO Conference in November 2001, or subsequently signed the Treaty, are not members of the governing body unless they also take the step of formally ratifying it. Countries that did not sign the Treaty during the period it was open for signature, may become Contracting Parties by depositing an instrument of accession to the Treaty. Accession has the same legal effect as signature plus ratification.

The governing body is the supreme organ of the Treaty and is empowered to take all the decisions required for the effective implementation of the Treaty. For example, it adopted the funding strategy at its first session and periodically sets targets for this strategy, ‘taking the Global Plan of Action’ into account.

It meets in biennial sessions and provides policy direction and guidance, adopts plans, programmes and budgets, is empowered to establish subsidiary bodies (e.g., committees), etc. The governing body may also consider and adopt amendments to the Treaty. Article 19 states that the governing body will keep the Conference of the Parties to the CBD informed of its work.

Article 19 also governs the decision-making process: ‘All decisions of the Governing Body shall be taken by consensus’ unless, by consensus, another method is agreed. This means that in practical terms, every Contracting Party has a right to veto decisions. Some might argue that this could hinder the Treaty from evolving, but others point out that this is the only politically feasible way of working.

Article 20. Secretary
The secretary of the governing body, who is in effect the secretary for the Treaty, is appointed by the director-general of FAO. The secretariat provides practical and administrative support for the governing body.

Article 21. Compliance
This article requires the governing body, at its first session, to consider and approve ‘cooperative and effective’ operational mechanisms to promote compliance and to address issues of noncompliance. Examples of this (cited specifically in the article) might be monitoring and provision of advice and assistance, including legal advice and assistance. Issues relating to compliance with the provisions of the SMTA will be discussed separately in Handout 24 on the SMTA.

Article 22. Settlement of Disputes
In the event of disputes between Contracting Parties, Contracting Parties shall seek solutions through negotiation. A third party might be recruited to mediate. Arbitration procedures are laid down in Annex II to the Treaty and are typical of those provided in other treaties. Submission of the dispute to the International Court of Justice is an option. Conciliation in accordance with Annex II is another option.

Article 23. Amendments to the Treaty
Amendments may be proposed by any Contracting Party. All amendments will be made by consensus and shall come into force 90 days after approval.

Article 24. Annexes
Annexes are an integral, binding part of the Treaty. Amendments to annexes shall be by consensus.
Article 25. Signature
The Treaty was open for signature (a tangible expression of support and intention to ratify) for one year. Signature on its own does not make the signing country a Contracting Party. That happens only when the signing country also deposits an instrument of ratification of the Treaty.

Article 26. Ratification, Acceptance or Approval
Instruments of ratification are to be deposited with the director-general of FAO.

Article 27. Accession
The Treaty is open for ‘accession’ to those States that did not sign within the one-year period during which the Treaty was open for signature. Accession is a one-step process that is equivalent to signature plus ratification. Countries that exercise this option enjoy equal rights and status with those that sign and ratify—no distinction is made.

Article 28. Entry into Force
The Treaty entered into force 90 days after the deposit of the 40th instrument of ratification or accession with FAO. Following this, the Treaty comes into effect for subsequent countries, 90 days after they ratify/approve it.

Article 29. Member Organizations of FAO
This article pertains to entities, such as the European Community, and how they notify the governing body of their competence to speak for the group, or not, in meetings. When determining whether 40 countries had ratified the Treaty, ratification by the EU was not counted in addition to its member states.

Article 30. Reservations
No reservations may be made to the Treaty by Contracting Parties.

Article 31. Non-Parties
The Contracting Parties agree to encourage non-Parties to accept the Treaty. This is the only mention of non-Parties in the Treaty. There was much discussion earlier of whether the Treaty would dictate the use of different (potentially discriminatory) treatment of non-Parties (in terms of access and benefit sharing, for instance). In the end, the Treaty is silent on the issue. This means that the Treaty does not govern or affect the dealings of Contracting Parties or CGIAR centres with non-Parties.

Article 32. Withdrawals
At any time after two years after the coming into force of the Treaty, Contracting Parties may withdraw by formally notifying FAO. Withdrawal takes effect one year after the receipt of such notification.

Article 33. Termination
If the number of Contracting Parties drops below 40, the Treaty will be automatically terminated.

Article 34. Depositary
The Director-general of FAO is the depositary of the Treaty.

Article 35. Authentic Texts
The official texts of the Treaty are those in Arabic, Chinese, English, French, Russian and Spanish. Each is equally authentic.

16 29 June 2004.
List of crops covered under the multilateral system

**Food crops**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Genus</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breadfruit</td>
<td>Artocarpus</td>
<td>Breadfruit only.</td>
</tr>
<tr>
<td>Asparagus</td>
<td>Asparagus</td>
<td></td>
</tr>
<tr>
<td>Oat</td>
<td>Avena</td>
<td></td>
</tr>
<tr>
<td>Beet</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>Brassica complex</td>
<td>Brassica et al.</td>
<td>Genera included are Brassica, Armoracia, Barbarea, Camelina, Crambe, Diplotaxis, Eruca, Isatis, Lepidium, Raphanobrassica, Raphanus, Sorghum and Sinapis. This comprises oilseed and vegetable crops such as cabbage, rapeseed, mustard, cress, rocket, radish and turnip. The species Lepidium meyenii (maca) is excluded.</td>
</tr>
<tr>
<td>Pigeon pea</td>
<td>Cajanus</td>
<td></td>
</tr>
<tr>
<td>Chickpea</td>
<td>Cicer</td>
<td></td>
</tr>
<tr>
<td>Citrus</td>
<td>Citrus</td>
<td>Genera Poncirus and Fortunella are included as rootstock.</td>
</tr>
<tr>
<td>Coconut</td>
<td>Cocos</td>
<td></td>
</tr>
<tr>
<td>Major aroids</td>
<td>Colocasia, Xanthosoma</td>
<td>Major aroids include taro, cocoyam, dasheen and tannia.</td>
</tr>
<tr>
<td>Carrot</td>
<td>Daucus</td>
<td></td>
</tr>
<tr>
<td>Yams</td>
<td>Dioscorea</td>
<td></td>
</tr>
<tr>
<td>Finger millet</td>
<td>Eleusine</td>
<td></td>
</tr>
<tr>
<td>Strawberry</td>
<td>Fragaria</td>
<td></td>
</tr>
<tr>
<td>Sunflower</td>
<td>Helianthus</td>
<td></td>
</tr>
<tr>
<td>Barley</td>
<td>Hordeum</td>
<td></td>
</tr>
<tr>
<td>Sweet potato</td>
<td>Ipomoea</td>
<td></td>
</tr>
<tr>
<td>Grass pea</td>
<td>Lathyrus</td>
<td></td>
</tr>
<tr>
<td>Lentil</td>
<td>Lens</td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td>Malus</td>
<td></td>
</tr>
<tr>
<td>Cassava</td>
<td>Manihot</td>
<td>Manihot esculenta only.</td>
</tr>
<tr>
<td>Banana/Plantain</td>
<td>Musa</td>
<td>Except Musa textilis.</td>
</tr>
<tr>
<td>Rice</td>
<td>Oryza</td>
<td></td>
</tr>
<tr>
<td>Pearl millet</td>
<td>Pennisetum</td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>Phaseolus</td>
<td>Except Phaseolus polyanthus.</td>
</tr>
<tr>
<td>Pea</td>
<td>Pisum</td>
<td></td>
</tr>
<tr>
<td>Rye</td>
<td>Secale</td>
<td></td>
</tr>
<tr>
<td>Potato</td>
<td>Solanum</td>
<td>Section tuberosa included, except Solanum phureja.</td>
</tr>
<tr>
<td>Eggplant</td>
<td>Solanum</td>
<td>Section melongena included.</td>
</tr>
<tr>
<td>Sorghum</td>
<td>Sorghum</td>
<td></td>
</tr>
<tr>
<td>Triticale</td>
<td>Triticosecale</td>
<td>Including Agropyron, Elymus and Secale.</td>
</tr>
<tr>
<td>Wheat</td>
<td>Triticum et al.</td>
<td></td>
</tr>
<tr>
<td>Faba bean/Vetch</td>
<td>Vicia</td>
<td>Excluding Zea perennis, Zea diploperennis and Zea luxurians</td>
</tr>
<tr>
<td>Cowpea et al.</td>
<td>Vigna</td>
<td></td>
</tr>
<tr>
<td>Maize</td>
<td>Zea</td>
<td></td>
</tr>
</tbody>
</table>
## Forages

<table>
<thead>
<tr>
<th>Genera</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Legume forages</strong></td>
<td></td>
</tr>
<tr>
<td>Astragalus</td>
<td>chinensis, cicer, arenarius</td>
</tr>
<tr>
<td>Canavalia</td>
<td>ensiformis</td>
</tr>
<tr>
<td>Coronilla</td>
<td>varia</td>
</tr>
<tr>
<td>Hedysarum</td>
<td>coronarium</td>
</tr>
<tr>
<td>Lathyrus</td>
<td>cicera, ciliolatus, hirsutus, ochrus, odoratus, sativus</td>
</tr>
<tr>
<td>Lespedeza</td>
<td>cuneata, striata, stipulacea</td>
</tr>
<tr>
<td>Lotus</td>
<td>corniculatus, subbiflorus, uliginosus</td>
</tr>
<tr>
<td>Lupinus</td>
<td>albus, angustifolius, luteus</td>
</tr>
<tr>
<td>Medicago</td>
<td>arborea, falcata, sativa, scutellata, rigida, truncatula</td>
</tr>
<tr>
<td>Melilotus</td>
<td>albus, officinalis</td>
</tr>
<tr>
<td>Onobrychis</td>
<td>viciifolia</td>
</tr>
<tr>
<td>Ornithopus</td>
<td>sativus</td>
</tr>
<tr>
<td>Prosopis</td>
<td>affinis, alba, chilensis, nigra, pallida</td>
</tr>
<tr>
<td>Pueraria</td>
<td>phaseoloides</td>
</tr>
<tr>
<td>Trifolium</td>
<td>alexandrinum, alpestre, ambiguum, angustifolium, arvense, agrocerum, hybridum, incarnatum, pratense, repens, resupinatum, rueppelianum, semipilosum, subterraneum, vesiculosum</td>
</tr>
<tr>
<td><strong>Grass forages</strong></td>
<td></td>
</tr>
<tr>
<td>Andropogon</td>
<td>gayanus</td>
</tr>
<tr>
<td>Agropyron</td>
<td>cristatum, desertorum</td>
</tr>
<tr>
<td>Agrostis</td>
<td>stolonifera, tenuis</td>
</tr>
<tr>
<td>Alopecurus</td>
<td>pratensis</td>
</tr>
<tr>
<td>Arrhenatherum</td>
<td>elatus</td>
</tr>
<tr>
<td>Dactylis</td>
<td>glomerata</td>
</tr>
<tr>
<td>Festuca</td>
<td>arundinacea, gigantea, heterophylla, ovina, pratensis, rubra</td>
</tr>
<tr>
<td>Lolium</td>
<td>hybridum, multiflorum, perenne, rigidum, temulentum</td>
</tr>
<tr>
<td>Phalaris</td>
<td>aquatica, arundinacea</td>
</tr>
<tr>
<td>Phleum</td>
<td>pratense</td>
</tr>
<tr>
<td>Poa</td>
<td>alpina, annua, pratensis</td>
</tr>
<tr>
<td>Tripsacum</td>
<td>laxum</td>
</tr>
<tr>
<td><strong>Other forages</strong></td>
<td></td>
</tr>
<tr>
<td>Atriplex</td>
<td>halimus, nummularia</td>
</tr>
<tr>
<td>Salsola</td>
<td>vermiculata</td>
</tr>
</tbody>
</table>