Seed security is defined as ready access by rural households, particularly farmers and farming communities, to adequate quantities of quality seed and planting materials of crop varieties, adapted to their agro-ecological conditions and socioeconomic needs, at planting time, under normal and abnormal weather conditions.

United Nations Food and Agriculture Organization

BACKGROUND

The Bauta Family Initiative on Canadian Seed Security (BFICSS) aims to help build a secure, diverse and resilient seed system in Canada. Launched February 1, 2013, the program provides training, conducts on-farm research on seed production and breeding for biodiversity, nutrition and performance in organic farming systems, supports seed library projects, and issues grants to help scale up and diversify seed production. More information on the program is available on our website at www.seedsecurity.ca.

The BFICSS is a field-based program, not a policy program. That being said, our work takes place in a tightly regulated sector and therefore requires an understanding of the legal frameworks governing seed. In 2013, we endeavored to assess the impacts of these regulations on seed biodiversity, ecological agriculture, and public access to seed in Canada.

Farmers are the traditional developers and stewards of seed. They must have consistent access to the seeds they need, when they need them. A secure seed system in Canada requires recognition of the value of crop biodiversity, and provisions for the production and dissemination of seeds that are regionally adapted and suitable for organic farming and other low-input farming systems. A significant portion of Canada’s agricultural biodiversity must remain in active circulation in the public domain, available to farmers and the general public to plant, save, and replant.

With this perspective in mind, we looked at four regulatory frameworks that pertain to seed governance in Canada: The Seeds Act; Organic Products Regulations; intellectual property regulations; and, the International Treaty on Plant Genetic Resources for Food and Agriculture. In this document we attempt to summarize the main provisions of the regulations, highlighting their impact on the areas of interest of our program.

This information is current up to January 31, 2014. Many of the regulations governing seed in Canada are under review, and there may be significant changes in the coming years. We will do our best to remain up to date, and will be available to discuss the regulations and their impacts on seed security with organizations and individuals working in this area.
INTRODUCTION

The regulatory frameworks for seed production and distribution in Canada are complex, and can have contradictory aims and implications. As we shall see, The Seeds Act, a fundamental piece of legislation, was implemented to safeguard farmers and the food industry against the circulation of poor quality seed. Some believe these regulations remain critical to ensure seed quality. However, others contend that the system favours large-scale conventional farming, limits biodiversity and under-serves organic producers. Similarly, laws designed to protect plant breeders’ rights and reward investments in developing seed varieties that perform well in conventional farming operations, can create the conditions for narrowing biodiversity and limiting farmers’ capacity to save seed. These impacts go against the aims of The International Treaty on Plant Genetic Resources for Food and Agriculture, to which Canada is a signatory. As such, Canada has two pieces of legislation that have conflicting objectives. This discussion paper will attempt to identify and untangle the key issues, aiming to spread awareness among those most affected by seed regulations, and perhaps highlight areas that should be addressed by proponents of ecological agriculture, biodiversity, and public access to seed in Canada.

THE SEEDS ACT

Overview

The Seeds Regulations, governed under Canada’s Seeds Act, provides national rules for testing, inspection, quality assurance, and sale of seeds in Canada. The Seeds Act governs the variety registration and pedigreed seed certification processes administered by the Canadian Food Inspection Agency (CFIA), Canadian Seed Growers’ Association (CSGA), and third party registered seed establishments (RSEs).

Canada’s variety registration system primarily focuses on documenting the characteristics, and for certain crops, assessing the agricultural value, of a new variety. Pedigreed seed certification is an additional regulatory requirement that tracks the pedigree of seed from a particular variety’s original breeder stock through subsequent generations of bulking up. Pedigreed seed must meet minimum standards for varietal purity, disease presence, and weed seed contamination. The Seeds Regulations maintains two Schedules that list crop kinds governed by the two processes:

- All varieties of the 52 crops listed in Schedule III require variety registration prior to being sold. It is illegal to sell any unregistered variety of these crop kinds.
- All varieties of the 70 crops listed in Schedule II require pedigreed seed certification in order to be sold by variety name.
- Crops not listed in the aforementioned schedules (e.g. most fruits and vegetables) are exempt from the Seeds Regulations, and can be sold by variety name in Canada.

A crop that appears in both Schedule III and Schedule II (e.g. alfalfa, barley, oats, and wheat) requires both variety registration and pedigreed seed certification. If a variety of that crop is registered, but the seed does not meet pedigreed standards, it can only be sold as “common” seed (i.e.: it cannot be sold by variety name).
For a crop listed in Schedule II, but not in Schedule III (e.g. field corn, chickpea, sorghum, and vetch), only pedigreed seed of that crop can be sold by variety name. However, there is no variety registration process required for this crop:

**EXAMPLE 1: SCHEDULE II AND III CROP – LEGAL NAMES FOR A WHEAT VARIETY**

<table>
<thead>
<tr>
<th>Pedigreed Seed</th>
<th>“AC Barrie” (registered variety)</th>
<th>“Striker” (unregistered variety)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Pedigreed Seed</td>
<td>“AC Barrie”</td>
<td>Does not exist</td>
</tr>
<tr>
<td>Non-Pedigreed Seed</td>
<td>“Common seed”</td>
<td>Illegal to sell</td>
</tr>
</tbody>
</table>

**Variety Registration: A Closer Look**

As of 2009, crops that require variety registration (Schedule III) are further broken down into Part I, II, and III crops. Part I crops (e.g. wheat, barley, pulses, and canola) require performance testing through production trials to assess the merit of each new variety submitted for registration. Part II (safflower) and III crops (potatoes and sunflowers) do not require merit assessments to be registered.

In partnership with the CFIA, recommending committees across the country evaluate whether new Part I crop varieties submitted for registration are equal, or superior, to historically referenced varieties (“checks”) in the market. Recommending committees assess the merit of new cultivars based on crop-specific agronomic, quality, and disease resistance standards. For example, wheat varieties are tested for crop yield (agronomic), protein content (quality), and fusarium ratings (disease resistance), among other indicators. The purpose of merit assessments is to ensure that new varieties contribute to the overall improvement of agriculture in Canada.

**Pedigreed Seed Certification: A Closer Look**

Pedigreed seed certification, administered by the CSGA, prevents designated field crop seed from being sold by variety name unless it was grown following the pedigreed seed process. In order to achieve pedigreed certification, pedigreed seed stock must be used, and seed must meet specific quality standards at each stage of multiplication. Pedigreed seed is generally identified with a blue certification tag, and commands a premium in the market. Farmers may save and replant this seed on their own farm, but pedigreed seed saved in this manner (“brown-bagging”) cannot be sold by variety name.
The Issues

Impacts On Genetic Diversity

Many heritage cereals grown by ecological producers (e.g. heritage varieties of wheat, such as Red Fife, and relatives of wheat including Emmer and Einkorn) do not fit the definition of a “variety” (i.e. distinct, homogeneous, uniform, and stable). Seeds circulated for these crops are often variable populations that maintain some trait consistency across generations, but may evolve and adapt when grown out in different regions. This adaptation can help optimize productivity in a farmer’s local environment, and can be acceptable for niche markets that accept higher levels of processing variability (e.g. local mills and artisanal bakeries).

Production of some of these varieties, such as the ancient relatives of wheat (e.g. Emmer, Einkorn, Khorosan), is not restricted because they are not listed in Schedule III, and therefore not subject to registration and merit testing. This is not true for wheat (Triticum aestivum) and spelt (Triticum aestivum subsp. spelta), both listed in Schedule III, Part I. In these cases, the system narrows the diversity of varieties in circulation by prohibiting farmers from selling heritage varieties because they are not registered, or were not grown through the pedigreed process. Similar restrictions apply to modern populations that have a higher degree of genetic diversity and morphological heterogeneity, excluding them from being considered a variety in the regulatory sense.

Impacts On Ecological Agriculture

Recommending committees in the variety registration process generally consist of commodity groups/commissions, grower and processor associations, plant breeders, and government and university representatives. It has not been standard for recommending committees to involve representatives from the organic sector, and the evaluation criteria do not generally include indicators suitable for ecological farming (e.g. genetic diversity, competitiveness with weeds, intercropping capability, organic matter replenishment, etc.). With very few exceptions, performance trials are conducted under conventional conditions, with criteria mostly suited to large-scale conventional farming. Data from merit assessments can provide useful information about the performance of a newly-released variety; however, because of the current parameters of the system, this information is not particularly useful for ecological growers.

Challenges related to the pedigreed certification process compound the issues for ecological field crop producers. Most contend that meeting the standards of pedigreed seed certification under ecological conditions is too difficult. For example, costs and labour requirements increase significantly if a producer attempts to achieve pedigreed standards for weed seed contamination and seedborne disease presence without the use of synthetic herbicides and fungicides. Additionally, pedigreed organic seed, or “double-certified seed” involves costs related to two layers of certification – these costs are not offset by price premiums for double-certified seed. As a result, virtually all organic field crop seed is sold as “common”. Producers procure conventional pedigreed untreated seed, save seed from that crop, and re-sell or re-plant it as organic common seed.
Impacts On Seed Availability And Quality

The variety registration system has contributed to inhibiting the development of varieties suitable for ecological agriculture. However, the regulations have also ensured that varieties developed through private breeding programs must go through the same certification measures as public breeding programs. This has helped prevent the seed market for some crops from being flooded with poor quality seeds or solely proprietary varieties. As such, many farmers are concerned that the trend towards deregulation, loosening the standards of the variety registration system, and permitting the deregistration of older varieties, would remove the checks and balances that provide farmers with good quality seed.

ORGANIC PRODUCTS REGULATIONS

Overview

The organic sector is the fastest growing agricultural market in Canada, and currently the fourth-largest organic market in the world. Since 2009, Canada’s Organic Products Regulations require organic farmers to use certified organic seed when it is available. However, an exemption (“derogation” in policy parlance) may be permitted if certifiers are satisfied that obtaining organic seeds is not feasible for the producer. Due to a lack of availability and high price premiums on organic seed, derogations are common, and many producers use untreated conventional seed in their organic production.

The Issues

There are very few varieties of vegetables and field crops for which organic seed is produced on a farm-scale in Canada. The lack of investment in organic seed research and development, combined with the option to use untreated conventional seed in organic production, inhibit the development of the commercial organic seed market. One approach to remedy this issue would be to strictly mandate the use of organic seed in organic farming. Opinions in the organic sector vary on the benefits of this strategy. On the one hand is the belief that it would spur growth, improve the supply, and establish a quality standard for organic seed. On the other hand is a concern that stricter application of organic standards would further narrow the range of varieties available to organic growers, who are already at a disadvantage in costs of production, economies of scale, and market size, relative to their conventional counterparts.

For field crops, this issue is compounded by the difficulty of growing seed organically and following pedigreed seed standards (“double-certified seed”, referred to earlier in the pedigreed seed certification section). Only pedigreed seed can be sold using variety name, but the certification process for pedigreed seed does not include an assessment of performance under organic conditions. Seed produced to meet the standards of pedigreed seed without chemical inputs would likely require some sacrifices in volume, resulting in an even wider price gap between organic and conventional seed. Since organic seed is already sold at a premium and many producers are not willing or able to pay the higher price of double-certified seed, mandating the use of organic seed could introduce economic barriers that discourage farmers from transitioning into, or remaining in, certified organic production.
There are also debates on the benefits of certification. Some producers have abandoned organic certification in favour of direct marketing to clients who trust in the ecological integrity of their production methods. The arguments in favour of direct marketing without certification are strong; however, it cannot be overlooked that certification remains the only national standard that can assure that the production system is truly organic. This is a contentious issue in the ecological farming sector: given the time it would take for the commercial organic seed market to develop on its own, the organic seed exemption only adds to the complexity of how to effectively provide more regionally-grown organic seed, without disadvantaging organic producers.

INTELLECTUAL PROPERTY RIGHTS REGULATIONS

Overview

International Context
The International Union for the Protection of New Varieties of Plants (UPOV) is a global institution that establishes an international system to protect and reward the innovation of new plant varieties. There are two versions of UPOV: UPOV ‘78 and UPOV ‘91. Signing onto either of these agreements is voluntary. Intellectual property rights (IPRs) for all types of products and technologies are governed by an international arrangement administered by the World Trade Organization (WTO), called the Agreement on Trade-Related Intellectual Property Rights (TRIPS). TRIPS sets minimum standards for the IPR laws of WTO member states, including laws related to plant genetic materials. TRIPS requires member states to implement patents, plant breeders’ rights, or other plant variety protection systems, and acknowledges the framework outlined in UPOV. Since it meets the requirements of the broader international IPR arrangement, several countries have signed on, or are planning to sign on, to UPOV ‘91.

Plant Breeders’ Rights Act
The Plant Breeders’ Rights (PBR) Act is Canada’s domestic application of UPOV ‘78, and the main regulatory framework for governance of IPRs for seeds. The PBR Act aims to provide individuals, companies, and institutions with a mechanism by which they receive a fair return (i.e. royalties) for their investment in plant breeding. The PBR Act gives breeders exclusive rights to propagate and distribute material they register as a protected plant variety: no sale of seed is permitted without authorization from the holder of the protected variety. In order to qualify for protection, the variety must be new, distinct, uniform, and stable. There are two important exemptions in Canada to this protection: the research exemption, which allows breeders to use protected varieties in their plant breeding programs; and, the farmer’s privilege, which allows farmers to save seed from protected varieties for their own use.

As part of Canada’s proposed Agricultural Growth Act (Bill C-18), and influenced by Comprehensive Economic Trade Agreement (CETA) negotiations with the European Union, discussions are currently underway to adopt UPOV ‘91. This would align Canada with the standards of several international trading partners. There are five key changes in UPOV ‘91 that farmers and breeders should be aware of:
1. Terms of protection of plant varieties would be extended from 15 to 20 years.

2. Scope of protection would be extended so that royalties collected on IPRs could be applied not only at the sale of seed, but elsewhere in the value chain as well, although royalties could still only be collected one time for a given seedlot. For instance, if a farmer used a protected variety without permission, the breeder could charge royalties during the processing of the crop, seeing as there was no opportunity to exercise their right at an earlier stage.

3. Breeders can apply for protection for “essentially derived varieties”; that is, varieties that are derived from and retain the essential characteristics of protected varieties. The commercialization of an essentially derived variety would require authorization from the PBR holder of the protected initial variety. This change prevents breeders from making minor modifications to protected varieties and applying for new PBRs.

4. The farmer’s privilege is explicitly included in UPOV ‘91, but, there is a provision in UPOV ‘91 for the privilege to be revoked or adjusted at the discretion of national governments.

5. There would be no restrictions on applying for a patent on a species that is also eligible for PBR, thereby enabling double protection (In Canada, this change is less relevant, because plant species cannot currently be patented).

**Patents In Canada**

Patents are distinct from PBRs, and covered separately under Canada’s Patent Act. Plants bred through traditional breeding cannot be patented; breeders must acquire PBRs for new plant varieties if they want to protect them. It is, however, possible to patent the process of splicing genes and inserting them into plant cells (transgenics), as well as altering genes themselves, without extending patent protection to the living plant.

Transgenic plants are commonly known as genetically-engineered (GE) or genetically-modified (GM) crops, categorized in Canada as “plants with novel traits”. GE/GM plants that contain a patented gene are generally protected through the patent on that gene. A registration process governed by Health Canada and the Canadian Food Inspection Agency (CFIA) regulates the cultivation, marketing, and sale of plants with novel traits. GE/GM plants must go through this process before they can be produced and sold in Canada. This process is separate from the variety registration and the pedigreed seed certification processes for non-GE/GM crop varieties.

Patent-holders selling GE/GM crops typically control their patents through technology use agreements (TUAs). Farmers sign TUAs when purchasing GE/GM seed, and agree not to save and replant the seed, or sell it to others. Under this arrangement farmers can be held liable for both infringing on patents and violating the terms of the TUA. In the precedent set in Monsanto v. Schmeiser, farmers who grow and save seed from plants with patented genes without permission from the patent-holder – deliberately or not – can be sued for patent infringement.
The Issues

Be it through patenting, PBR, or another framework, IPR systems essentially encourage the development of proprietary seeds. These seeds, which are increasingly GE/GM, are most profitable to seed companies supplying large-scale, low-diversity, capital-intensive farming operations. In contrast, ecological farmers generally require seeds with traits such as disease and pest resistance, competitiveness with weeds, high nutrient use efficiency and formation of beneficial rhizosphere associations. Broader genetic diversity within the variety is also frequently beneficial. These characteristics minimize reliance on agricultural inputs such as herbicides, pesticides, and fertilizers. Increasingly, seed companies breed for tolerance to these products, and profit on sales of both seed and the complimentary input. As this type of research, development and marketing approach becomes more and more prevalent, farmers practicing alternative forms of agriculture find it increasingly difficult to find seeds that meet their needs.

GE/GM seeds are currently available for five crops produced in Canada (corn, canola, soy, sugar beet, and alfalfa). Varieties of other crops have been approved for release, but are not yet registered. Due to the large land area occupied by these crops and intensification of GE/GM development, concerns about cross-contamination and declining access to seeds that can be saved and replanted are warranted. While cross-contamination is an issue for both conventional and organic producers, risks are higher for organic growers, because crops grown from GE/GM seed cannot be certified organic. Moreover, there is significant evidence that increased use of GE/GM seeds that require synthetic inputs and treatments will also increase the adverse environmental and human health effects associated with those synthetic crop applications.

With respect to the pending adoption of UPOV ‘91, the biggest concern in the farming sector is the loss of the rights of farmers to save seed of protected varieties and not having to pay royalties each year on saved seed. UPOV ‘91 contains the “farmer’s privilege”, which allows farmers to save seed for their own farm, as long as the seed is not sold. However, UPOV ‘91 also provides government the option to restrict farm-saved seed, if that practice is deemed to inhibit research and development for plant breeding. Many believe this provision makes the farmers’ privilege moot, putting the centuries-old practice of seed saving at risk. While restrictions on seed-saving are a concern for any production system, it should be noted that UPOV ‘91 only applies to varieties that currently have PBRs attached to them. Some varieties used in ecological production are protected, but many are not. By expressing concern about regulations that limit seed-saving, while simultaneously building the supply and distribution of non-proprietary ecologically-grown seed, farmers and seed advocates can continue to create opportunities that ensure these seeds remain widely available in the public domain.

The proposed adoption of UPOV ‘91 is consistent with Canada’s increased implementation of IPRs for seed. Proponents contend that IPRs will sustain/improve existing and new plant varieties while fairly rewarding the capital, time, technology, and labour invested in crop development. It is a system, they argue, that can provide seeds beneficial for all farmers. Others argue that the proliferation of IPRs contributes to centralizing ownership of plant genetic resources, narrowing the diversity of crop varieties in circulation, disadvantaging ecological production, impeding public access to seeds, and threatening farmer autonomy in seed procurement and production.
INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Overview
The International Treaty on Plant Genetic Resources for Food and Agriculture (“The Treaty”) focuses on sustaining and improving the agricultural biodiversity of plant genetic resources. Essentially, its purpose is to ensure that farmers, plant breeders, and the public, have fair and equitable access to plant genetic materials. The Treaty also aims to ensure that all parties who contribute to improving existing plant varieties and developing new cultivars are recognized and receive an equitable share of the benefits.

Signatories to this treaty are obliged to support initiatives that promote *in situ* conservation of seed adapted to ecologically sustainable production, and ensure that these genetic resources remain publicly accessible. However, implementation is at each country’s discretion. In many cases, provisions are to be done “as appropriate”, “subject to [the country’s] national legislation” or “in accordance with [the country’s] needs and priorities”. As a signatory of The Treaty, Canada meets some requirements admirably, whereas actions on other obligations are more ambiguous.

The Issues
Multilateral System
Signatories agree to make seeds and information about 64 designated crop species available to the public, scientific institutions, and private sector plant breeders, for the purposes of research and conservation. Plant Gene Resources of Canada (PGRC) fulfils this obligation through public access to the gene-bank database (GRIN Canada). Accessions can be requested based on the Standard Material Transfer Agreement (SMTA) of the Multilateral System for Access and Benefit Sharing of The Treaty.

Access And Benefit Sharing
A Benefit-Sharing Fund is administered through The Treaty Secretariat to fund projects to conserve and utilize crop diversity. The fund also supports projects related to on-farm management and conservation, food security, and innovative partnerships between public/private actors. Canada participates in issuing a call for proposals for the Benefit-Sharing Fund, and also supports benefit-sharing by using the SMTA when distributing germplasm from PGRC.

Farmers’ Rights
Under The Treaty, governments are responsible for implementing policies that realize Farmers’ Rights. Farmers’ Rights were designed to recognize the contributions that local and indigenous communities and farmers have made to crop diversity and agriculture. It is unclear how Canada has made provisions for Farmers’ Rights, and this is true for many Treaty signatories. Few examples exist of practical applications of policies and practices that recognize Farmers’ Rights.
Sustainable Use
Participating countries must develop and implement policies that promote ecologically sustainable use of plant genetic resources. Measures include maximizing intra- and inter-specific plant diversity, promoting participatory plant breeding, promoting locally adapted varieties, and broadening the variety of genetic material available to farmers. It is unclear how Canada has explicitly made provisions for the sustainable use of plant genetic resources for food and agriculture. However, the federal government has funded various programs related to breeding germplasm with disease resistance and other research/project grants for ecological agriculture.

Global Information System
Article 17 of The Treaty states that, “Contracting Parties shall 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”. PGRC aims to fulfil this obligation through the maintenance of their online database of accession and taxonomic queries, and crop descriptions of seeds in their database.

CONCLUSION
The regulatory frameworks for seed production and distribution in Canada are multifaceted and, at times, at odds with each other. In an effort to deliver quality assurance for farmers, the Seeds Act limits biodiversity and can under-serve organic producers. Similarly, as a signatory to The Treaty, Canada engages to take action to preserve biodiversity, increase in situ conservation, and protect the rights of farmers to save seed. However, the pending adoption of UPOV ‘91 may undermine this engagement by promoting proprietary plant breeding and limiting farmers’ capacity to save seed.

Canada’s farmers, seed producers, processors, and distributors, operate in this complex regulatory environment. The Bauta Family Initiative on Canadian Seed Security will continue its efforts to stay updated on seed policy developments, and share information on seed regulations in particular as they relate to ecological agriculture, biodiversity conservation, and public access to seed.

We welcome feedback on the issues raised in this document and also on how our program can best serve the interests of ecological seed producers and farmers in Canada. For more information on The Bauta Family Initiative on Canadian Seed Security, and to find contact information for the program representative nearest you, please visit www.seedsecurity.ca.
NOTE FROM THE DIRECTOR
The Bauta Family Initiative on Canadian Seed Security is a field-based program focused on conservation, research, training, and market development. It is therefore important to maintain a solid understanding of the policy context within which we operate. This document is designed to provide an easy reference on the rules and regulations that govern seed in Canada. It is the fruit of review of the policies themselves, as well as discussion with a wide range of experts mandated to understand Canadian and international seed policy and regulatory frameworks. Thanks to their thoughtful contributions we hope to have created a useful compilation for Canadian seed producers and others working in this field. The Bauta Family Initiative on Canadian Seed Security will continue its solutions-oriented approach and move forward within the regulatory landscape to create a strong culture of seed production and seed saving in Canada.

Jane Rabinowicz, Director
The Bauta Family Initiative on Canadian Seed Security
USC Canada