

**Genetically Modified Seeds, Biodiversity and Food Security:  
A Critical Assessment of the Impact of Agricultural Biotechnologies on  
Communities in Developing Countries**

**Policy Brief**

This brief is presented by *The Working Group on Canadian Science and Technology Policy*, a group comprised of international development, church and farmers organizations, including Canadian Organic Growers, ETC Group, Inter Pares, National Farmers Union, Social Justice Committee, United Church of Canada, and USC Canada.

This brief is an outcome of a series of events held March 7-10 2005 organized by the Working Group that included a roundtable with Canadian government officials and public events in three cities (Ottawa, Saskatoon, Montreal), and featured the perspectives of a group of 9 farmers, scientists and agricultural policy experts from Africa, Asia and Latin America. The purpose of the events was to facilitate exchanges on critical issues related to agricultural biotechnology in developing countries.

**Issue**

Canada is, indirectly and directly, supporting and promoting agricultural biotechnology in developing countries through trade expansion, research funding and other activities including via the Consultative Group on International Agricultural Research (CGIAR) and the United Nations Food and Agriculture Organization (FAO). These activities present on-going challenges to communities in developing countries who have yet to comprehensively assess the impacts of agricultural biotechnology, particularly genetically modified seeds. Those most likely to be affected – small-scale farmers and indigenous peoples – are yet to be fully engaged in decision-making over the research and application of these new technologies.

**Recommendation**

The Canadian Government must critically assess the impacts of agricultural biotechnology on communities in developing countries as part of its ongoing policy development process, and before any further investments are made in this controversial area. The Canadian Government must do this by taking the lead from farmers organisations such as Via Campesina and its affiliates, indigenous peoples organisations and national governments that will be most affected.

**Rationale**

Farmers are innovative and successful plant breeders who have selected and saved seed over millennia to develop crop varieties that suit local conditions and meet specific nutritional and cultural needs. It is this highly specialized local and traditional knowledge that is the foundation of food sovereignty whereby communities are relatively self-reliant, finding solutions to existing food insecurities through

knowledge and use of biodiversity. Biodiversity forms the basis of food security, as well as multiple other securities, in communities across the world - biodiversity provides medicine, fuel, fodder and food, both through cultivated and uncultivated species.

Agricultural biotechnology tends to create "one-size-fits all" crop products that are not developed for local conditions. The enormous biological diversity of local ecosystems is essentially overlooked in the development and introduction of biotechnologies that are developed outside this context. Divorcing agriculture and culture through the introduction of external inputs breaks chains of knowledge that have sustained communities for millennia. Furthermore, agricultural biotechnology can threaten biodiversity. This is most dramatically seen in the contamination of local varieties, a reality that many communities now face. Such contamination constrains the choices that farmers have, and can be economically devastating. It also constitutes an assault on indigenous cultures and other cultures that are intimately tied to the land and agriculture.

The risks of relying on seeds that are developed outside local knowledge systems are grave for peasants and small-scale farmers. This is especially the case with genetically modified seeds, as the benefits have been generally oversold and industry promises are, for small farmers in particular, largely unmet. Monocropping with genetically modified seeds that are not adapted to local climatic and soil conditions is fraught with risks. Peasant and small-scale farmers are often unable to absorb losses from genetically modified seeds that do not perform. The consequences can be devastating, as seen in the Warangal district of Andhra Pradesh, India where Monsanto's Bt cotton (cotton genetically modified to be insect resistant) traits failed and hundreds of indebted farmers resorted to suicide.<sup>1</sup> Highly vulnerable communities whose resilience has been weakened are not good subjects for experimental introduction of new genetically modified seeds, no matter how well intentioned. It is best to build from the community's own strengths rather than to introduce new uncertainties.

There is no doubt that science and technology have an important role to play in international development but, as with most interventions, "context" is everything. The contexts for the introduction of agricultural biotechnology are not neutral and the applications of the technology can therefore exacerbate existing inequalities and vulnerabilities. The underlying causes of hunger in communities across the world consistently lie in political, social and economic structures rather than in agricultural production. Where this is the case, genetically modified crops are unlikely to address problems of hunger. Where choice is constrained because farmers are under unique political and economic pressures, the introduction of genetically modified seeds is experienced as an imposition. Furthermore, small farmers and farming communities are sidelined in the debates and decisions about the future of agricultural biotechnology. If new technologies are introduced into a foreign environment in the absence of clearly understood demand including the possibility that the recipients might say 'no' -- there is every risk that the tool will take priority over the purpose.

## **Solutions**

### **1. Build agricultural policies from the bottom up, directed by local farmers and grounded in local knowledge.**

Policies need to be built from the bottom up by relying on farmers to identify their own needs. Farmers are successful innovators with a repository of extraordinary knowledge about biodiversity and local conditions. Women in particular are often the seed keepers, the keepers of biodiversity, and their role in agriculture demands that they play a central role in directing agricultural policies. The connection between agriculture and culture must be recognized and valued such that agricultural policies do not undermine local knowledge and culture. Solutions to existing problems in food security can often be found in local knowledge including that of biodiversity. It is for this reason that the era of "Big Box Science" must come to an end. The significant resources Canada now provides through the Canadian International Development Agency to initiatives such as BECA (the Biosciences in Eastern and Central Africa facility) demand that we first ask the question: "does this answer a real need?" Our overall impression is that such research investments will not support rural development or agro-ecological strategies that will strengthen food sovereignty. Canadian government resources should encourage collaboration within and between governments; between governments and civil society -- especially farmers' organizations and community associations -- and between governments and academia.

*"(...) if you ask a Malian farmer what he needs, he will tell you that he needs a plough, a pair of oxen and water to irrigate his field. He will not tell you that he needs genetically modified seed."*

- Ibrahim Coulibaly, Director of External Affairs, Association of Professional Producers of Mali, in testimony to the Senate Committee on Foreign Affairs, Ottawa, March 8<sup>th</sup>, 2005

### **2. Take action to stop contamination and protect biodiversity.**

The Canadian Government must ensure that it is possible for local communities to stop the contamination of local varieties that constrains the choices of farmers and constitutes an assault on indigenous cultures. The reality of contamination must be acknowledged and community assessments of its impacts on biodiversity and culture must be recognized as legitimate. Implicit in any acceptance of contamination is the judgement that biodiversity does not matter. But biodiversity must be valued and protected as the source of multiple securities for communities in developing countries. Rather than ignore this diversity -- a treasure that has been built up by thousands of generations of farm families and indigenous communities -- we should see in it what farmers see in it: the building blocks of food security and rural development.

Moreover, Canada's food security, and for that matter, the global food system, is inextricably linked to the in-situ conservation and sustainable uses of agricultural biodiversity that is mostly found in the South. There are past examples of the importance of biodiversity in times of crisis, for example, when North American barley was decimated in the 1950s in Canada and the US following an outbreak of yellow dwarf virus. These crops were only saved thanks to resistant genes found in an Ethiopian barley variety.<sup>2</sup> Biodiversity supports food security and contamination is

a threat to both. The Canadian government should take immediate steps to ratify the Cartagena (biosafety) Protocol and work to strengthen this agreement.

### **3. Respect the rights of countries to reject food aid containing genetically modified organisms.**

Governments in the developing world are under tremendous pressure to accept food aid that contains genetically modified (GM) organisms. It is the responsibility of the Canadian Government to maintain its commitments to respect national decisions relating to food aid. The Canadian Government can play an important role in supporting the rights of other governments to reject GM food aid, as well as decisions to accept GM food aid only if milled (as a measure to prevent environmental contamination). Canada can work through the United Nations World Food Programme to politically support the right of states to receive food aid free of GMOs, as well as work through the FAO and CGIAR to prevent and protect the sanctity of gene banks from contamination.

### **4. Ban Terminator (GURTS) technology nationally and support an international ban at the United Nations.**

In 2000, the UN Convention on Biological Diversity called for a *de facto* moratorium on the introduction of Terminator technology. Terminator (Genetic Use Restriction Technology) is a genetically modified seed technology that renders seed sterile at harvest, forcing farmers to purchase new seed every growing season. The UN Food and Agriculture Organization, Consultative Group on International Agricultural Research, governments including India and Brazil, prominent scientists, and a number of international seed companies have all agreed that this technology should not be allowed. However, in February 2005, the Canadian government delegation to a scientific subcommittee of the Convention on Biological Diversity had orders to try to end the *de facto* moratorium and to "block consensus" on any other outcome. Canada's position surprised other governments, shocked the Canadian public and provoked a global outcry. Countries in the South, in particular, consider Terminator technology as a grave threat to food security. If Canada is to have any credibility in proposing and supporting a "Pro-Poor" science strategy, it must amend its Terminator policy to support a ban on the technology within Canada, and internationally. Moreover, Canadians should be fully consulted on policy relating to Terminator.

### **5. Support trade policies that support and protect farmer livelihoods.**

The World Trade Organization, regional trade agreements, and bilateral trade agreements -- as well as the interventions of the World Bank and the International Monetary Fund -- have undermined even the most constructive efforts to support food security and well-being. The impact of dumping highly subsidized Northern food products at below market prices in the South has decimated farm livelihoods in many countries. Similarly, the introduction of genetically modified crops can cost farmers market share. Canada must direct its negotiators at the WTO and elsewhere to adopt not a "Pro Poor" science strategy but a "Pro-South" trade policy. By drawing on our own experiences, Canada can provide leadership in supporting policies that protect farmer livelihoods and local markets. For example, Canada's wheat board and supply management boards have been of utmost importance for Canadian farmers. Similar instruments existed in Africa until they were dismantled by International Monetary Fund and World Bank structural adjustment measures. Canada can work within these

international organizations to ensure governments have the flexibility required to enact agricultural policies that support rural livelihoods and food sovereignty.

**6. We must support democratic processes that empower countries to develop their own agricultural policies to ensure food sovereignty.**

The Canadian Government is involved in various initiatives to support democratic governance in developing countries. However, much of this work may be threatened by the continued introduction of inappropriate agricultural biotechnology initiatives. There is a long history of the introduction of inappropriate technologies to countries in the South and the negative impacts these have had on food security and rural livelihoods. This can only be put to an end when countries themselves are supported to develop appropriate agricultural policies. There is no technology that can overcome systemic political and social problems. In fact, the introduction of technologies into these contexts can exacerbate injustices and delay much needed social change.

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<sup>1</sup> The failure of Bt cotton in India is well documented through daily research with small farmers. Source: Deccan Development Society, "Bt Cotton in Andhra Pradesh: A three year assessment", April 2005. [www.ddsindia.com](http://www.ddsindia.com)

<sup>2</sup> It is estimated that the resistant strain saves farmers in the state of California alone US\$ 150 million in pesticides each year. Source: Qualset, C.Q. 1975. Sampling germplasm in a centre of diversity: an example of disease resistance in Ethiopian barley. In: *Crop Genetic Resources for Today and Tomorrow*. Edited by Frankel O.H. & J.G.Hawkes. Cambridge University Press, Cambridge. Pp: 449-453.