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## **Caribbean Basin**

### **Biotechnology - GE Plants and Animals**

#### **Agricultural Biotechnology Annual Report**

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**Report Highlights:**

Updated Sections: All.

Members of the Caribbean Community (CARICOM) have been working on developing national frameworks to deal with issues related to biosafety since 2001. While some progress has been made in terms of establishing these frameworks and drafting biosafety legislation, no Caribbean country has a biosafety regulatory system in place to date. Consequently, biotech products can be traded, consumed, and utilized for research and production without any significant restriction in most islands. However, biosafety regulatory systems are expected to become a reality soon. Policy development and harmonization have kicked into overdrive in the past two to three years, culminating in a draft CARICOM regional biotechnology and biosafety policy and strategy proposal being circulated in late 2009. CARICOM is aiming to obtain approval for its proposal by year's end and fully implementing it by 2011.

## **Section I. Executive Summary:**

Biotechnology remains a relatively new endeavor in the Caribbean with most research and applications limited to cell biology and diagnostic techniques. Consequently, the Caribbean has no regulatory system in place yet to govern the use of modern biotechnology and safeguard public health, animal health, or the environment. Because the region has very limited agricultural production, and research is limited to a small number of crops and animals in select islands, farm applications of biotechnology have been relatively few. The lack of any regulation has also meant unrestricted trade for biotech products. While consumer awareness of biotech issues is growing, it is still not widespread. The region relies on the United States as its main supplier of food and agricultural products.

Change may be just around the corner, however. As a whole the region has been working to address the need for a regulatory regime for biosafety, and many islands have already developed comprehensive policies in this regard. However, several steps still need to be taken before any regulatory changes become reality. These include enacting legislation, development of specific implementing regulations, setting up the appropriate institutional structures, and capacity building in areas such as inspection, risk assessment, and laboratory testing.

While much of the policy formulation work to date has been done at the individual island level, CARICOM has been hard at work to harmonize the region's biosafety policies to ensure an adequate balance between biosafety and biotechnology development and trade. Momentum is beginning to build toward this end and a much awaited unified, region-wide policy and strategy proposal was circulated in late 2009. The proposal is still in the process of being vetted by all parties involved and CARICOM is seeking to have it fully approved by its members by the end of 2010. Concurrently, work on establishing the necessary regulatory structures and having governments enact biosafety legislation is also moving forward with the aim of achieving full implementation by the end of 2011.

## **Section II. Plant Biotechnology Trade and Production:**

Farm activity is generally quite small in the Caribbean Basin Agricultural Trade Office (CBATO) islands of coverage<sup>1/</sup> due mainly to very limited land, water and labor resources. Even within this context, production of biotech crops in the region is limited. Most production is really in the form of tissue culture research done at the laboratory level with very limited intentional introduction into the field. The following table summarizes the main plant biotech work being conducted in our region. No data is available on actual crop area.

*1/ - The CBATO islands of coverage include: Anguilla, Antigua & Barbuda, Aruba, The Bahamas, Barbados, Bermuda, British Virgin Islands, Cayman Islands, Dominica, Guadeloupe, Martinique, Grenada, Montserrat, Netherlands Antilles (Curaçao, Bonaire, Sint Maarten, Saba & St. Eustatius), St. Kitts & Nevis, St. Lucia, Saint Martin, St. Barthélemy, St. Vincent & the Grenadines, Trinidad & Tobago, and Turks & Caicos Islands.*

Country	Agency	Type of Work
Trinidad and Tobago	University of the West Indies (UWI)	Tissue culture research on anturiums & orchids
Trinidad and Tobago	Ministry of Agriculture	Tissue culture on cassava
Trinidad and Tobago	Tobago House of Assembly	Tissue culture on tuber crops (cassava, yams, sweet potato)
Barbados	Ministry of Agriculture*	Tissue culture on cassava
Barbados	West Indies Breeding Station	Germplasm research on sugarcane
St. Lucia	Ministry of Agriculture	Tissue culture on bananas and orchids
Grenada	Ministry of Agriculture	Tissue culture on nutmeg, banana, spices, plantain, orchids and cassava
St. Vincent & The Grenadines	Ministry of Agriculture**	Tissue culture on bananas, vanilla, orchids

\*With assistance from the Caribbean Agricultural Research and Development Institute (CARDI) research station in St. Vincent.

\*\*With support of the Taiwanese government.

From a trade standpoint, several islands import genetically modified corn and soybeans which are channeled mostly into animal feed production. Most if not all of these imports are of U.S. origin.

### **Section III. Plant Biotechnology Policy:**

Less than half of the CBATO's islands of coverage are parties to the Cartagena Biosafety Protocol. Moreover, many islands have no laws or regulations specifically addressing Living Modified Organisms (LMO's) in terms of their use, their release into the environment, marketing, or trade. Where no policy exists, there has been no restriction on trade or tracking of biotech products. As a whole, the region is very open to U.S. trade.

However, some islands, particularly those in the eastern Caribbean, have made some important strides in recent years in terms of setting forth new biosafety policies. Since 2001 several Caribbean countries (see table below) have been working toward establishing their own National Biosafety Framework (NBF), with the help and funding from the United Nations Environment Programme-Global Environment Facility (UNEP-GEF). Individual island NBFs are at different stages of development, but at a minimum several countries now have a "draft" regulatory policy (covering food, biosafety and co-existence). NBF's need to be approved by the Cabinet of each country, which is then followed by the drafting of legislation, which later needs to be approved by the legislature before any implementation can begin. To date, no country has enacted any biosafety legislation quite yet. However, UNEP is undertaking a biosafety implementation project to assist countries in this regard

(including getting them to enact their individual biosafety laws) and subsequently coordinating implementation at the regional level. Stumbling blocks remain in terms of defining some of the regional vs. national mechanisms for biosafety, determining the administrative implementation, and more importantly securing all the financial commitments from sources other than UNEP-GEF. A meeting between the biotech focal points of the 12 CARICOM countries<sup>1/</sup> which are part of the effort took place in June 2010 in Barbados to iron out the differences. UNEP expects full implementation, which will include having all the institutional structures in place and functioning, by the end of 2011. The following table shows the CBATO islands of coverage which are parties to the Cartagena Protocol on Biosafety and their different stages of policy development.

Country	Cartagena Protocol on Biosafety in Effect	National Biosafety Framework (NBF) in Place	Biosafety Legislation in Place (Draft)	Biosafety Implementation
Antigua & Barbuda	2003	Yes	Yes	No
The Bahamas	2004	Yes	No	No
Barbados	2003	Yes	No	No
Dominica	2004	Yes	Yes	No
Grenada	2004	Yes	Yes	No
St. Kitts & Nevis	2003	Yes	No	No
St. Lucia	2005	Yes	Yes	No
St. Vincent & The Grenadines	2003	Yes	No	No
Trinidad & Tobago	2003	Draft	No	No

#### Harmonization of Regional Policies

Much of the work to develop the NBFs in the islands listed above was done separately and with only limited collaboration. Thus, with each new NBF being developed the need for harmonization quickly began to become evident. Enter the Caribbean Community (CARICOM), which is made up of 15 member states and four associate members throughout the region, and is the strongest regional organization in the Caribbean. CARICOM established a committee, chaired by CARDI, to

*1/- The Bahamas, Belize, Grenada, Guyana, Suriname, Antigua and Barbuda, Barbados, Dominica, St. Kitts and Nevis, St. Lucia, Trinidad and Tobago, St. Vincent and The Grenadines.*

address the issue of harmonization and coordinate efforts between member states. In 2009 the

committee commissioned a review of all the individual island biosafety policies being developed. In late 2009 the committee examined the findings of this review and began a consultation process at the national level with several member States to explore ways of unifying positions toward a harmonized regional policy.

As a result of these efforts, in late 2009 CARICOM put forth a draft regional biotechnology and biosafety policy and strategy. This is a \$6 million, long-term comprehensive effort encompassing agriculture and food, medicine and healthcare, industrial applications, environment and energy, and biodiversity management. This proposal is being coordinated by the Regional Office for Latin America and the Caribbean (ROLAC) of UNEP-GEF, with consulting by the UWI, and funding from UNEP-GEF and CARICOM. The proposal focuses on five main thematic areas:

- a. Expanding applications of biotechnology in CARICOM Member States;
- b. Development of biosafety regulatory systems;
- c. Development of appropriate legal, regulatory and institutional frameworks;
- d. Development of human capital;
- e. Education, training and public awareness

In terms of the first area, CARICOM foresees opportunities for the region to develop biotech products to improve sugarcane, cotton, rice, coconuts, cocoa, coffee, peppers, spices, medicinal plants, and ornamental plants. CARICOM's strategy regarding these crops is to liaise with regional commodity groups to establish a funding mechanism to fund biotechnology and biosafety initiatives for each of the commodities. Other areas of focus include developing biopesticides and biofertilizers, biosensors using enzyme technology, and improved animal breeding.

Initially the proposal was to be presented to CARICOM's Council for Trade and Economic Development (COTED) for approval by 2009, but without it being finalized the target date for COTED approval was pushed back to 2010. Meeting this new target date still remains a challenge as not all aspects of this effort have been fully worked out. Further national and regional consultations which are to take place by September/October 2010, should help further refine the policy and strategy document prior to it being submitted to the COTED for approval.

### Labeling

One of the issues which will need to be ironed out is that of labeling of biotech products. While some countries such as Trinidad & Tobago prefer a voluntary approach to labeling, some eastern Caribbean countries favor making labeling of biotech products mandatory. Enforcement of mandatory labeling will likely be disruptive to trade. First of all, most of the islands source a large share if not the majority

of their food from the United States, where biotech labeling is not mandatory. Intra-regional food trade would surely be affected as well. Mandatory labeling also implies testing of imported products, which would require establishing regional, internationally certified laboratory facilities. This in turn raises questions in terms of testing costs and the time required to test products and make decisions regarding their import. CARICOM recognizes the complexity of this issue and that there is divergence on the matter among its members. While no major progress has been made in reaching consensus on the issue, CARICOM is conscious that it will need to push toward harmonization of labeling rules.

### Intellectual Property Rights (IPR)

IPR protection in relation to biotechnology is another issue being considered by CARICOM in its attempt to harmonize biotech policies. Intellectual property legislation also varies among the islands and not all countries have modernized their IPR laws and policies. CARICOM's policy proposal identifies the need to establish an IPR framework, policies and procedures, recognizing that a framework is needed to encourage commercial development of biotechnology, while seeking protection for those who own intellectual property assets.

### Structure and Organizations

The institutional framework being developed for the different organizations involved with biosafety varies by island. In general, however, each island where a biosafety policy is under development would eventually have a National Biosafety Authority or equivalent organization overseeing all matters pertaining to biotechnology and biosafety. Each island would also have a BioSafety Committee comprised of representatives from all relevant Ministries and organizations. In fact, practically all of the countries engaged in biotech policy formulation have already appointed a BioSafety Committee. In Trinidad and Tobago, for instance, the current Biosafety Committee is comprised of six members from the Ministries of Agriculture, Health, Trade and Consumer Affairs, the National Agricultural & Food Safety Agency (NAFSA), the Environmental Management Authority, and the UWI. In Trinidad and Tobago the Biosafety Committee acts as the national biosafety clearinghouse, but in others countries this function may be assigned to another entity.

From a regional standpoint, CARICOM's policy proposal and strategy calls for the creation of two entities: a) a Science Technology Innovation Unit within CARICOM to oversee science and technology issues; and b) a Regional Biotechnology and Biosafety Commission/Secretariat to provide guidance to regional governments in all areas of biotechnology and biosafety through a regional mechanism, among other things. Both of these have yet to be established.

### Timeline

CARICOM's policy and strategy proposal is divided into three phases. Phase one (year 1) of the

proposal focuses on establishing the CARICOM regional Biotech /Biosafety framework and the CARICOM Science, Technology, Innovation Unit. Phase 2 (years 2-5) focuses on capacity building, including developing the framework for research and development funding, technology transfer and commercialization, public awareness, and education and training. Phase 3 (years 4-5) focuses on evaluation of the implementation carried out in phases 1 and 2.

In essence, until biosafety/biotech policies and regulations are fully developed and enacted and the institutional structures are put in place, no regulatory implementation can take place. In such an environment, governments are generally following the guidance of international organizations, the UWI, CARDI, and similar institutions when it comes to dealing with any biosafety issues that may arise.

#### **Section IV. Plant Biotechnology Marketing Issues:**

Although awareness of biotechnology in the CBATO islands is not widespread, it is growing. As part of the work conducted in most islands to develop their National Biosafety Framework, each country conducted consultations with stakeholders and carried out public education campaigns with schools, youth groups and other organizations. Producers, which might have greater awareness of the benefits of biotechnology, are generally more inclined to be in favor of adopting biotechnology. Given this situation and the lack of any biotech-specific policy implementation to date, there are no real marketing issues which affect U.S. trade at this point.

Some countries, such as Dominica and St. Vincent, that export organically grown crops to niche markets in Europe, are concerned with biodiversity issues. With the islands being so small, they are specifically concerned with containment of and coexistence with any biotech material introduced into the islands that would jeopardize their exports to Europe. This concern may be a factor in shaping the regulatory environment in the region.

#### **Section V. Plant Biotechnology Capacity Building and Outreach:**

Within the CBATO region of coverage, much of the current biotech expertise lies in Trinidad and Tobago and to some extent in Barbados. Part of the reason for this is that the UWI, which is one of the leading research institutions in the region, has campuses in both countries. Moreover, Trinidad is also home to CARDI, a regional research institution which as mentioned earlier is also engaged with biotech policy harmonization efforts. Trinidad also has greater laboratory capability than many of its neighbors.

As a whole there are well-known limitations in terms of institutional structures and human resource capacity throughout the region. This is why CARICOM, as part of its comprehensive policy proposal, plans to conduct a biosafety needs assessment and prioritize those needs to seek funding for projects to address those needs. CARICOM recognizes that the region will need a long-term (10 years) human capital development strategy, focused on education at all levels. CARICOM will also seek to facilitate the development of a scholarship and training fund at the national level. There is a need to develop university programs focused on biotechnology at the undergraduate and graduate levels, as well as

short-term training programs. Training will need to address all facets of biotechnology: legal, procedural, commercial, and scientific. Three areas of capacity building needs which stand out are inspection services, risk assessment, and laboratory capability.

The issue of laboratory capability is of special concern. There is general consensus on the need for some degree of laboratory specialization in certain islands rather than each country establishing its own. However, there are still many unresolved questions relating to the type of laboratories needed, the specific types of testing to be conducted, whether the laboratories are to be associated with Universities or not, etc. CARICOM has conducted a study on agricultural health laboratory capabilities in the region and has produced a proposal involving 3 tiers of laboratories to address the region's needs. However, agreement on all the variables has not been reached including on key elements such as cost and sustainability.

A Caribbean workshop on biotechnology was conducted in September 2009 in St. Vincent and The Grenadines. The event was organized by the Inter-American Institute for Cooperation on Agriculture (IICA) and supported by FAS' Emerging Market Program (EMP). The workshop targeted non-technical decision makers/regulators and focused on fundamental scientific principles and the need for transparent, science-based regulation of agricultural biotechnology in the Caribbean. Particular emphasis was placed on the need to focus on the development of human resources. With only an estimated 60 biotechnology graduates in the English speaking Caribbean, capacity building will be a crucial issue moving forward. Networking was also identified as a key element to advancing biosafety efforts in the region. IICA committed to developing a networking proposal to assist CARICOM members to capitalize on the opportunity to learn from the experience of other countries/regions, both in terms of policy development and scientific research.

#### **Section VI. Animal Biotechnology:**

Most of the biotech work that is being conducted with animals is related to Barbados Blackbelly sheep. CARDI, in collaboration with the UWI, is conducting work to identify micro satellite markers for fingerprinting the breed to help conserve and improve it. The Ministry of Agriculture in Barbados and the UWI in Trinidad are also working to improve the effectiveness of artificial insemination of the breed. Biotech work is also being conducted with some institutions outside the CBATO region, such as CARDI in Jamaica and the University of the Virgin Islands in St. Croix, to be able to properly identify purebred sheep in the region and create a record keeping system for purebred animals.

However, the Caribbean is not yet at the stage where genetic engineering and/or cloning of animals are being conducted. As outlined earlier, individual islands are still in the process of developing and harmonizing their biotech policies with the help of CARICOM, UNEP-GEF, and others institutions. At this point, there are no specific animal biotechnology issues being addressed in the policy formulation process, and the region is not really engaged in any specific animal biotechnology discussions in international fora either. As mentioned earlier labeling/traceability of biotech products as whole (not necessarily specific to animal products) is something which is yet to be worked out. With many of the policies still being shaped and harmonized, it remains to be seen if labeling of biotech products will become compulsory or not. From the consumer standpoint, there is growing awareness of biotechnology as a whole. While there is no market rejection of genetically engineered or cloned animals, consumer perception in this regard has not been truly tested.

