MINISTRY OF AGRICULTURE
&
FISHERIES

Annual Report
2004

ACRONYMS

ACP	African, Caribbean and Pacific Countries
Agstat	Agriculture Station
AI	Avian Influenza
AQUIF	Aquaculture and Inland Fisheries
ASWAP	Agriculture Sector Wide Approach Programme
ATM	Automatic Teller Machine
BAHA	Belize Agricultural Health Authority
BAS	Belize Audubon Society
BEST	Belize Enterprise for Sustainable Technology
BFCU	Belize Fisheries Capture Unit
BFR	Belize Farm Registry
BGA	Banana Growers Association
BIARD	Belize Institute for Agricultural Research and Development
BLPA	Belize Livestock Producers Association
BMDC	Belize Marketing and Development Corporation
BSE	Bovine Spongiform Encephalopathy
BSP	*Banana Support Programme*
CAC	Central American Agricultural Council
CARICOM	Caribbean Community
CARD	Community-Initiated Agriculture and Rural Development
CARDI	Caribbean Agriculture Research and Development Institute
CARIFORUM	Caribbean Forum
CARTF	CARIFORUM Agribusiness Research and Training Fund
CATIE	Tropical Agronomic Centre for Research and Education
CBO	Community Based Organization
CCU	Conservation and Compliance Unit
CDB	Caribbean Development Bank
CDE	Centre for Development of Enterprise
CFIA	Canadian Food Inspection Agency
CFU	Caricom Fisheries Unit
CGA	Citrus Growers Association
CGWCU	Citrus Growers and Workers Credit Union
CITES	Convention for the Regulation of International Trade of Endangered Species
CORECA	Regional Central American Council for Agriculture
CPBL	*Citrus Product of Belize Limited*
CREI	Citrus Research and Education Institute
CRFM	Caribbean Regional Fisheries Mechanism
CSF	Classical Swine Fever
CZMAI	Coastal Zone Management Authority and Institute
DFID	Department For International Development
EU	European Union
FAO	Food and Agriculture Organization

FAOR	Food & Agriculture Organization Representative
FDA	Food and Drug Administration
FDS	*Family Drip System*
FTAA	Free Trade Area of the Americas
GAP	Good Agriculture Practices
GEF	Global Environmental Fund
GMO	Genetically Modified Organism
GMP	Good Manufacturing Practices
GOB	Government of Belize
GPS	*Global Positioning System*
HACCP	Hazard Analysis and Critical Control Point
HIVOS	Humanist Institute for Co-operation with Developing Countries
IAC	Inter-American Convention for the Protection & Conservation of Sea Turtles
ICCAT	International Commission for the Conservation of Atlantic Tunas
IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
IICA	Inter-American Institute for Cooperation on Agriculture
IMMARBE	International Merchant Marine Registry of Belize
INFAL	International Network of Food Analytical Laboratories
MAF	Ministry of Agriculture and Fisheries
MAF	Meso-American Reef
MBRS	Meso-American Barrier Reef System
MOU	Memorandum of Understanding
MYS	Maximum Sustainable Yield
NARI	National Agriculture Research Institute
NEMO	National Emergency Management Organization
NGO	Non Governmental Organization
NMFS	National Marine Fisheries Services
OIRSA	International Regional Organization for Health in Agriculture
OSPESCA	Regional Fisheries & Aquaculture Organization in Central America
PAHO	Pan American Health Organization
PHMB	Pink Hibiscus Mealy Bug
PREPAC	Regional Plan for Continental Fisheries & Aquaculture in Central America
REIS	Regional Environment Information System
RFS	Rural Financial Services
RK	Red Kidney
ROC	Republic of China (Taiwan)
RUTA	Regional Unit for Technical Assistance
SAQS	Strengthening Agriculture Quarantine System

SCPC	Sugar Cane Production Committee
SCQCA	Sugar Cane Quality Control Authority
SFA	Special Framework of Assistance (Bananas)
SICA	Central American Integration System
SICB	Sugar Industry Control Board
SIRDI	Sugar Industry Research and Development Institute
SMP	Synoptic Monitoring Program
SPAGS	Spawning Aggregation Sites
SPFS	Special Project for Food Security
SPS	Sanitary/Phyto-sanitary
TASTE	Toledo Association for Sustainable Tourism & Empowerment
TCGA	Toledo Cocoa Growers Association
TCP	Technical Cooperation Programme
TED	Turtle Excluder Devices
TIDE	Toledo Institute for Development and Environment
TNC	The Nature Conservancy
UNDP	United Nations Development Programme
USA	United States of America
USDA	United States Department of Agriculture
UTN	National Technical Unit for RUTA
VDRU	Veterinary Drug Registration Unit
WNV	West Nile Virus
WTO	World Trade Organization
WWF	World Wildlife Fund

MINISTRY OF AGRICULTURE & FISHERIES (MAF)	ANNUAL REPORT 2004
OUR CLIENTS and PARTNERS IN DEVELOPMENT	Farmers Fishers Cooperatives Producers and workers Processors and manufacturers Distributors and exporters Consumers and investors National and local government Civil society Local and external donors

THEME	Agriculture and Fisheries: Pillar of the Belizean Economy
VISION	A transformed/modern sector that is fully competitive, diversified and sustainable.
MISSION	To continue as the economic pillar of Belize, ensuring food security, generating income and foreign exchange, creating employment, and conserving natural resources, in order to grow the economy, reduce poverty and empower the local population for sustainable development.
STRATEGIC OBJECTIVES	1. Increase the efficiency, profitability and competitiveness of the agriculture, fisheries and cooperative sectors 2. Accelerate the diversification in production, processing and exports 3. Improve and conserve the natural and productive resource base to ensure long-term sustainable productivity and viability 4. Improve access to productive resources and services and create economic opportunities for small/young farmers, women and indigenous people, particularly in poor, marginal areas 5. Strengthen the institutional capacities to provide effective support in marketing and trade, research and extension, as well as relevant education and training

Table of Content

Foreword

In real terms 2004 represented a good year for agriculture as significant expansion was experienced in the major commodities. However, the external environment continued to be hostile as price reduction was experienced by most of our commodities, particularly, citrus and shrimp. Food imports were reduced by more than $9 million which represented saved foreign exchange and some additional funds for local producers.
On April 2003 the Ministry of Agriculture & Fisheries completed work on the "***National Food & Agriculture Policy 2002-2020, No Farmer= No Food.***" Given the need to prioritize policies and needs together with limited financial & human resources, an Agriculture Development Strategy was developed during 2004. This working document will assist the sector in adjusting within the context of adverse budgetary constraints exacerbated by the fact that Belize as a very small agriculture export player is vulnerable to external shocks and experiencing continuous erosion of preferential markets.

Focus of the strategy is on the non-traditional sub-sector as a means of increasing food security, reducing poverty and promoting dynamic processes of rural and agriculture development consistent with the vision of the sector of ***"A Transformed Modern Sector That Is Fully Competitive, Diversified and Sustainable."*** The structure of the strategy is divided into three main programmes: technology & extension development, market development for non-traditional crops, productive policy incentives and institutional strengthening. The time-frame for the strategy is 5 years from 2005-2010. Implementation of the sector strategy will be through a partnership arrangement with the public sector, partners-in-development and civil society .

Many thanks to all producers, exporters and parties involved in agriculture, fisheries and cooperatives for their continued confidence and willingness to invest in the sector. The commitment from the Government of Belize for agriculture and rural development will continue in 2005 and I commit the Ministry of Agriculture & Fisheries to continue to find ways to alleviate poverty especially in the South.

Hon. Michael Espat
Minister of Agriculture & Fisheries

Acknowledgement

The Annual Report represents team work by the Departments of Agriculture, Fisheries, Cooperatives and the Trade/Policy Unit; together with the inputs from the Belize Livestock Producers Association, the Belize Agriculture Health Authority, the Belize Marketing & Development Corporation, the United States Department of Agriculture, the Caribbean Agriculture & Research Development Institute, the United Nations Food & Agriculture Organization, the Republic of China on Taiwan (Agriculture Technical Mission) and the International Regional Organization for Health in Agriculture. The support which the staff of the various departments, units, sections, projects, programs and partner-agencies provided in preparing respective reports, made possible the completion of the Annual Report 2004 for the Ministry of Agriculture & Fisheries.

Thanks is also extended to farmers, fisher-folks, producers, distributors, exporters, importers, investors and other Government Ministries which continuously supported the Ministry's work during 2004; YOUR COOPERATION facilitated and contributed towards the achievements as enunciated in the Annual Report 2004.

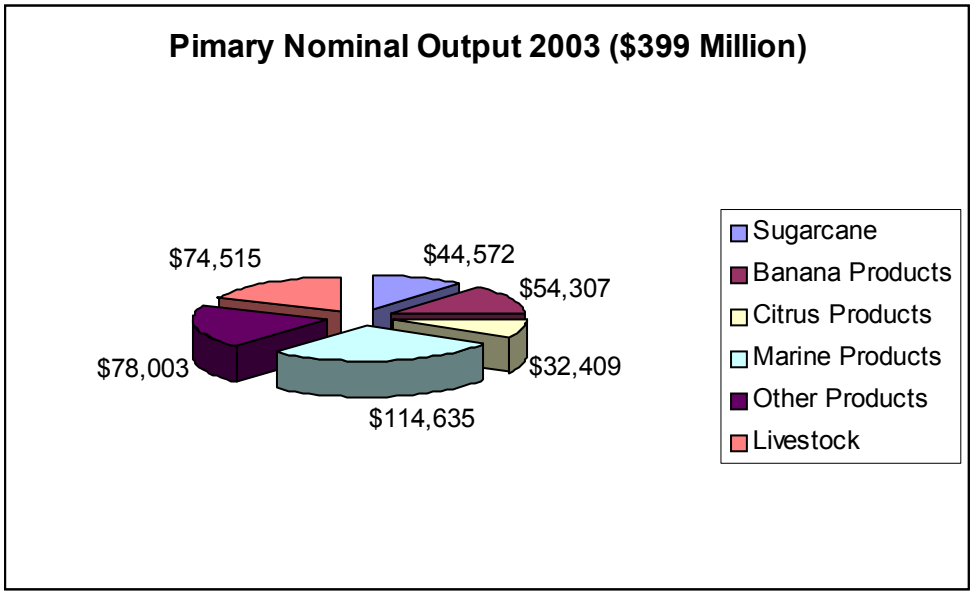
Executive Summary

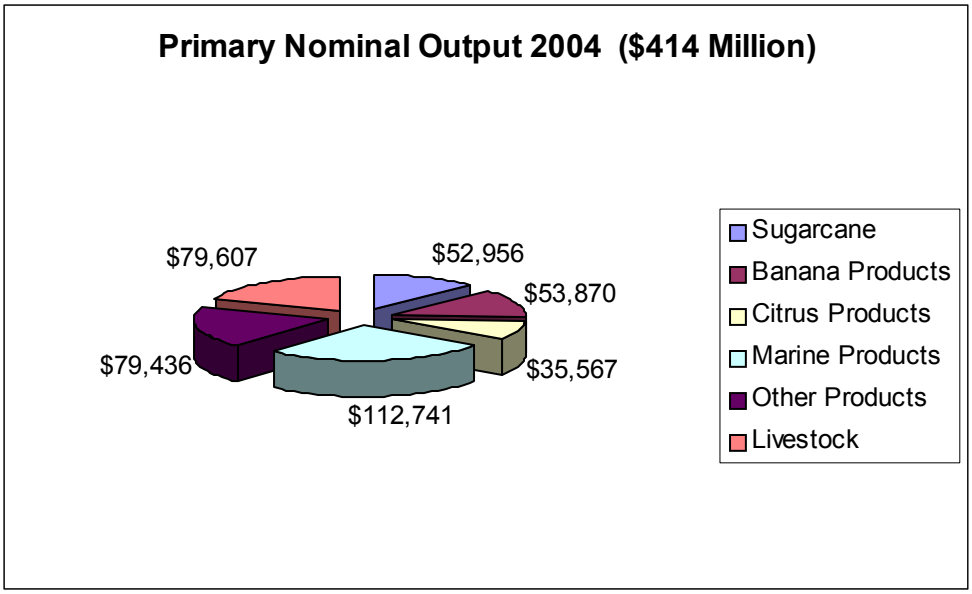
For 2004 the agriculture & fisheries sub-sector continued to demonstrate positive real and nominal growth. Growth was experienced under a hostile external environment of downward prices, reduced preferences and a challenging domestic situation. Reduced prices in 2004 relative to 2003 resulted in lost export earnings of more than $34.8 million. The brunt of the this adjustment was taken by the citrus and shrimp industries; the papaya industry was also affected negatively. Sugar/ pepper sauce prices showed upward movement; prices for lobster, conch, RK beans and black-eye peas were favourable.

The challenging domestic situation was based on an unfavourable macro-economic scenario of tightening fiscal and monetary policy. Budgetary cuts compelled the Ministry of Agriculture & Fisheries to reduce support to the sector; the private sector is finding more taxes being levied on its activities, thereby, reducing its competitiveness. The tightening monetary policy has caused scarcity in credit for productive investment ,together, with higher interest rates and more stringent loan requirements from the banks.

The primary agriculture sector expanded from $399 million to $414 million (3.8 % increase); this figure represents income received by farmers and thus rural development; it measures primary agriculture (excludes agro-processing and value-adding) at producer prices.

Nominal growth in the sector came from sugar (19% growth) and livestock (7.3%), followed by citrus at 10%; little growth was experienced by the banana and fruits/vegetables sector at 1% and 2% respectively. Income in the fisheries sub-sector declined by 3% due to unfavourable market condition for farmed shrimp.





In 2004 exports expanded by more than 5.5% from $342 million to in 2003 to $360.9 million in 2004. Growth came mostly from expansion in real exports (output) since average prices showed a downward trend. Value of sugar/molasses exports expanded from $73.7 million to $83.3 million (13% increase) due to increased unit exports and improved prices for sugar. Banana exports remained relatively constant at $52.9 million due to increase output/exports, in spite, of lower prices.

Citrus exports expanded from $82.9 million to $89.1 million (7.4% increase) due to a substantial increase in output of oranges (24% increase)/ grapefruit (116% increase) concentrate and orange squash (39% increase); citrus prices took the brunt of price reductions in the Belize agriculture sector for 2004. Market price for citrus concentrate and squash exhibited substantial price cuts ranging from 45% for grapefruit squash to 32% for orange concentrate.

Fisheries export earnings showed a decline of $2.7 million from $110.2 million in 2003 to $107.5 million in 2004 due to lower prices for shrimp. Increased farmed shrimp output together with higher prices for conch and lobster was not sufficient to make up for the lower prices being received for shrimp.

The value of non-traditional exports increased from $22.3 million in 2003 to $28.1 million in 2004. Contributing factor to this expansion was increased unit exports of pepper sauce (62% increase), papayas (52%) and red kidney beans (18%); exports of black-eye peas decreased by 42% in 2004. The dominant commodity in the non-traditional sector continues to be papaya with $22.8 million in exports, representing 82% of total non-traditional exports.

Being fully cognizant of the short/medium-term external and domestic challenges facing agriculture, the sector is committed to its long-term vision of a *"Transformed modern sector that is fully competitive, diversified and sustainable,"* by focusing on goals of food security, poverty alleviation, equitable access to assets and sustainable

management of the natural resources. The medium term objectives for the sector remain productivity increases, deeper and greater diversification of the production base and markets, competitiveness improvement, and institutional & networking development with partners-in-development.

1.0 AGRICULTURE DEPARTMENT

The prolong drought experienced in 2004 impacted negatively on overall production and productivity of most agricultural commodities. The sub-sectors hardest hit were: rice, soybean, corn, hot peppers, among others. Despite this constraint other sub-sectors reported substantial growth and development.

1.1.0 Crop Development

The crop development program for 2004 focused on strengthening new and existing farmers' organizations, revitalizing national coordinating technical committees, and expanding the fruit tree program to diversify from traditional into non-traditional fruit trees. The major achievement in vegetable was the calenderization of planting of the different vegetable commodities to avoid market gluts and a collapse in prices. In rice the major achievement was the consolidation of existing network with the private sector. The hot pepper industry is now on the path of recovery and a medium and long-term plan will be put in place to foster the sustainability of the industry. The commissioning of the soybean factory in the Orange Walk district is a major development toward the expansion of the soybean industry. Papaya exports also `increased significantly and is now a commodity of economic importance generating more than $22 million dollars annually in foreign exchange.

1.2.0 Traditional Export Crops

Banana: Banana production (6,136 acres) continued its upward trend with 79,560 tonnes in 2004, 8% more than that produced in 2003. The export value increased by only 1% (from $52.6 in 2003 million to $53 million in 2004)since the industry continued to be affected by downward prices in the World market. Efforts continued to increase efficiency through rehabilitation and product quality improvements with assistance from the EU financed Banana Support Programme (BSP) through the Special Framework of Assistance (SFA).

The EU announced its proposal for a tariff setting of Euro 230 per tonne, much to the chagrin of Belize and other Caricom countries which were pressing for a tariff of no less than Euro 275 per tonne. With the proposed tariff expected to go to arbitration where a possible decrease is feared, Belize debated whether a fight to maintain the status quo (quotas), but with an increased license for market share, would be more beneficial if at all possible in the current climate of trade negotiations. With further

assistance forthcoming under the BSP the banana industry expects that it will be able to compete under the proposed tariff only regime starting in 2006, if the tariff does not fall below Euro 230. The BSP was, however, fraught with setbacks in project implementation mostly due to delays in processing payments at the level of the EU delegation in Jamaica and/or headquarters at Brussels.

A transition strategy to comply with the new EU procedures (which requires the BSP to be implemented by a public entity) was prepared and approved by the delegation. In connection with this a verification mission was undertaken by Brussels in October 2004 to determine the level of decentralization to be afforded Belize based on the accountability and transparency of our existing financial systems. Belize did not qualify for decentralized management of project funds under the EU's criteria and so BSP project funds remain under management by the delegation in Jamaica.
In preparation for the rural development component of the BSP a social survey in the banana belt was conducted by a local NGO but it was not completed due to non-payment. A financing agreement was signed at the end of 2004 for SFA 2003 which includes the components of establishing a direct market presence in the EU and the introduction of value adding through processing of reject bananas. In mid-2004 interviews were conducted by the project steering committee; an assistant project director was selected and hired. Up to 2004 19.28 million euros had been allocated to the industry but only 6.36 million euros received due to implementation constraints in the EU office in Jamaica or Brussels.

Sugar: As a result of favorable weather conditions coupled with improvements in the operation of the factory and lower levels of extraneous material like mud, deliveries and overall throughput experienced an increase in 2004 over 2003. Producers delivered 1.15 mn long tons, an increase of 7.1% over 2003. Consequently sugar production stood at 116,515 long tons, an increase of 11.6% over 2003. Farmers earnings from sugarcane delivery improved by 19% to $52.9 mn from $44.6 mn in 2003. Part of this increase was due to increased exports to the EU and CARICOM markets; export earnings increased from $73.7 million to $81.5 million in 2004. Depending on the outcome of the WTO DOHA round of negotiations preferential prices are expected to fall by as much as 37% within the next few years, consequently earnings should decrease proportionately.

2003/2004 Crop Statistics

MONTH	SUGAR CANE DELIVERIES (LONG TON)				SUGAR PRODUCED (LONG TON)				MOLASSES
	COROZAL	ORANGE WALK	BSI-RESEARCH	TOTAL	TOTAL SUGAR	COROZAL	ORANGE WALK	BSI-RESEARCH	
TOTAL	556,663.05	579,752.26	13,059.88	1,149,475.18	116,576.72	56,860.37	58,383.91	1,332.43	41,056.06

As the policy making body in the Sugar Industry, the Sugar Industry Control Board (SICB), along with the Government of Belize, resolved to "remain in sugar for the long haul", despite all the challenges facing the sugar sector in the local and international fronts. All the committees working under the SICB and the Sugar Industry Act of 2001 were mandated to accelerate the reform process in the face of imminent changes to the European Union sugar regime. The SICB, along with industry stakeholders and the Ministry of Foreign Trade participated fully in the lobbying efforts along with our

partners in the African-Caribbean-Pacific (ACP) countries for the European Union (EU) to respect its legal commitments through the EU-ACP Sugar Protocol.

The Sugar Cane Production Committee (SCPC) is one of the most important Committees in the Sugar Industry. The SICB directed the SCPC to implement for the 2004/05 crop, a delivery system based on production as opposed to licenses. Under this system any registered cane farmer is being allowed to fully deliver his sugar cane production.

In an effort to improve quality of cane entering the factory and in preparation for the payment by quality system, this year the SICB mandated the SCPC to implement a 24-hour delivery system. On December 27, 2004 the Industry commenced the implementation of a 24-hour delivery system by which each Division, Corozal and Orange Walk, would be allocated 12 hours each to deliver their allocation for each day from 12:00 noon to 12:00 midnight and 12:00 midnight to 12:00 noon. This arrangement is being held on a weekly basis at which time the shifts will change.

The new Sugar Industry Act 2001 provides for the establishment of an autonomous body to be called the Sugar Cane Quality Control Authority (SCQCA). Among its other duties, the SCQCA is charged with the responsibility of implementing a cane payment system to farmers based on quality of cane delivered, based largely on sucrose content.

The SCQCA in an effort to provide an incentive to farmers to deliver good quality, fresh cane material and in keeping with government's policy to 'remain in sugar for the long haul,' has put forward a proposal for the implementation of a quality-based cane payment. This system will entail the use of a core sampler which will sample individual trucks entering the mill. These samples will be analyzed and, based on agreed formulas, will then provide a result of such analysis to individual farmers. Thus farmers will receive a different payment based on quality of cane delivery. In this way, the individual farmer will be rewarded for better cane material and the factory will also be forced to extract all sugar from those canes at the earliest time.

The Sugar Act 2001 provides for the establishment of a Sugar Industry Research and Development Institute (SIRDI). This year, due to financial shortfalls, not much was carried out in Research; technical personnel were assigned mostly to do some farmer education and crop estimates for the SCPC. The SICB took a decision to activate the SIRDI and a Board and Chairman have been appointed. The Chairman has requested that a TOR be made available to him for activation of SIRDI in 2005.

Citrus: Citrus deliveries like other traditional commodities experienced its share of increased production, 6.4 million boxes were processed, an increase of 24% over 2003. Grapefruit and orange production was up 37% and 22%, respectively. This marked increase can be contributed to favorable weather (rainfall), greater use of inputs by producers and the implementation of a Mexican Fruit Free program. The production of citrus juice increased by 20.0% to 34.1 mn pound solids as production of not-from-concentrate (NFC) and concentrates increased by 17.8% and 20.1%, respectively. Fresh orange exports increased by 47% to 15 million pounds ($2.2 million). The overall value of production increased by 10% to $35.6 mn. The 2004/05 crop is forecasted to be even

better in all aspects as production will increase and the hurricanes that hit Florida will affect world supply and prices.

1.3.0 Non-traditional Export Crops

Papaya: Papaya is the non-traditional export crop that experienced the greatest increase in production from 31.8 million in 2003 to 60.9 million lbs. in 2004, an increase of 91%. Belizean papayas fetch a premium price in the U.S. market due to their inherent and sustained quality. The three packing facilities that produced these papayas are: Fruta Bomba, Maya Papaya and Little Belize Fruit Packers. It is now a crop of economic importance contributing approximately $25 million to the economy. In Little Belize production was revived and a new packing facility was constructed by the community; out of their own initiative the community identified a new buyer in Florida and started to export in November; this facility exported 354,370 pounds of papayas to the buyer in Miami. Little Belize estimates an annual market of 11.6 million pounds from the buyer in Miami. The department is aggressively promoting papaya production to other non-Mennonite producers from neighboring villages. It is expected that at least ten new producers will invest in the cultivation of papayas in 2005.

Hot Pepper: Only 407,680 lbs of hot pepper were produced in 2004 while exports experienced a decrease of 30% over that of 2003. The decrease in production was as a result of: gemini virus damage, severe whitefly infestation, drought, delays in payments to producers and the untimely accessibility of good quality seeds. In response the MAF intervened by partnering with CARDI in the production of seeds, dialoguing with the BMDC to facilitate timely payments for peppers exported for the fresh market, technical assistance in proper field management to control whiteflies and the revitalization of the Hot Pepper Steering Committee. A Technical Sub-Committee was also formed to address technical needs such as research and training. As a result of the planning and coordinating mechanisms established in 2004 it is envisaged that production and exports of fresh peppers for 2005 will expand significantly. The current demand of this commodity for export is estimated at 1 million pounds per year. The two main buyers are Agro-world Ltd and Marie Sharp for fresh and process peppers, respectively.

Cacao: A total of 167,369 lbs. of cocoa beans were produced in 2004, of which 87,369 lbs were by organic and 80,000 by conventional production systems. Of the total organic production 71,200 lbs. of fermented beans were exported to the Green & Black Co. in England by the Toledo Cacao Growers Association (TCGA). Green and Black pays $1.78 per pound to the producer for fermented beans. This year 650 acres (500,000 seedlings) of new cacao fields were established in the southern districts through a grant

gotten from DFID, bringing the total acreage to 1,100 acres. The Monilia fungus outbreak detected in Maya Mopan was contained effectively within a short period as the area was quarantined immediately and infected fruits buried; an emergency steering committee was also established to address the problem effectively; furthermore, a fact-sheet management calendar was prepared/distributed while several seminars/workshops were conducted to train producers about the symptoms and management/control of the disease; the disease seem to have been contained as no new outbreak has been reported. A nursery has also been established in the San Antonio area of the Cayo district as some 40 acres are expected to be established in 2005. Members of the TCGA are also gearing up to intercrop with xate palm for export. By the end of December 2004 the Soil Association had 818 organic cocoa producers registered; there were only 220 producers in March of 2004. The company Hummingbird Hershey on the Hummingbird highway produced and exported 80,000 lbs. of conventional cocoa beans from the 400 acres it manages.

Ginger/Breadfruit: Several meetings were held to coordinate the exportation of ginger via the BMDC. As a result 3,472 lbs were exported to Miami. Farmers from the Stann Creek district produced the ginger and were paid $0.40 per lb. Initially the product was exported on a trial basis and it had good market acceptance. This shows that this commodity has great export potential and in the future can become one of the niche commodities that can earn foreign exchange for the country. The total production in 2004 was 185,000 lbs, representing an increase of 34% over the 2003 figures. To accommodate the export demand production will be increased to 300,000 lbs in 2005. A trial shipment of 700 lbs. of breadfruit was also sent along with the ginger and this too was well accepted by consumers in Miami; this commodity will be better coordinated in 2005 to take advantage of market opportunity.

Coconut: At the Central Farm station a total of 6,028 coconut seedlings were produced of which 55% were Maypan hybrid and 45% were Yellow Malayan Dwarf. This was enough to establish 80 acres of coconut orchards. A new five-acre plot of Yellow Malayan Dwarf came into production that will enhance the station's capacity to produce cross-pollinated seedlings by about 20%. A new accomplishment was the marketing of bagged coconut seedlings to meet the needs of the tourism sector. The linkages with INIFAB of Mexico continued and this year the agency visited the Central Farm Hybridization facility and other commercial plantations in the Stann Creek district. A survey was also conducted in 2004 and the data revealed that there exist around 700 acres in commercial plots and about 500 acres in young trees in the country. There is great demand of coconuts for processing by Big-H Enterprises and De la Fuente from the Cayo district. In recent years there has been much interest in coconut production/expansion. In 2003 some 9,245 coconut seedlings were sold.

Pineapple: The total production of pineapple in 2004 was 4.8 million lbs. As a result of the Ministry's intervention in facilitating a meetings with CPBL and pineapple producers, pineapple deliveries to the factory increased significantly from 598,000 lbs. in 2003 to 1.1 mn lbs. in 2004. The factory has informed producers that in 2006 it will process only pineapple of the Smooth Cayenne variety. In response the MAF facilitated the importation of 150,000 sets from Guatemala to on-sell to producers. The current demand

by CPBL for processing is 6.0 mn lbs. of pineapples. A field trip was also carried out to Guatemala by technical personnel from the MAF to observe commercial pineapple fields and a processing plant. In late 2004 US$10,000 was approved by FAO from its Telefood facility for a Smooth Cayenne seed multiplication project to assist producers meet the demand at the shortest time possible. The bulk of the pineapple produced was sold locally as the tourist sector demanded larger volumes as a result of greater cruise ship and overnight arrivals.

Soursop: The MAF launched an aggressive technical assistance program in an effort to promote the proper management of new and old soursop fields. From the 23 acres of established fields 24,575 lbs were harvested, which represented an increase of 12% over the 2003 figure. The Belize district has the largest acreage of soursop trees. In 2004 farmers were encouraged to utilize protective bags on the fruit and monthly spraying of the trees to control insect pests and diseases. Two fact sheets were produced on the "Identification of Pest and Diseases in Soursop" and "Cost of Production. In late December the MAF sponsored a mist-blower for the Belize district to support soursop producers in rehabilitating fields to increase production. Furthermore, protective bags were facilitated to farmers at 50% of the actual cost to protect against damage by the wasp (*Bephrata sp*). Five training seminars were held on good husbandry practices of the crop. The nursery at Central Farm produced 500 soursop seedlings to supply producers that wanted to expand or start production.

Onion: Onion is now a well-established crop with over 60 producers involved. Most of the productions is concentrated in the northern and Belize districts. The 2003/04 crop was 1.3 million lbs., his represents a decline of 27% from the previous year. Factors contributing to the decline were poor seed quality (low germination), planting of unrecommended varieties such as Yellow Granex which is susceptible to purple blotch and botrytis, poor access to credit, unusual weather conditions and high post harvest losses. From the acreage planted in the last quarter of 2004 production is expected to increase in 2005 to 2.3 mn lbs. as major bottlenecks have been addressed, including marketing. To date 6 onion storage structures have been constructed and an additional 17 structures will be built in 2005, some with the assistance of funds from FAO through its Telefood small grants program. The long-term goal is to supply the annual demand of 4.6 million lbs. of yellow onions.

Irish Potato: The 2003/04 potato crop was 1.6 million lbs., which represents an increase of 52% over the previous year. Even though overall production increased, yields/acre decreased by 32%. The main factors contributing to a decrease in yields were poor seed quality, early blight fungal disease and the drought as 85% of production is rain-fed. The Cayo and Orange Walk districts are the major producers. The forecast for 2005 indicate that production will be around 2.3 million lbs. since the seed material planted this year was healthy and no major disease has been reported. The quality of potato to consumers will improve as producers are being sensitized to adopt the quality requirements demanded by the Bureau of Standards. The main constraints are lack of storage facilities to store the crop after harvest and lack of irrigation facilities. If these two limitations are

addressed the productivity and profitability of this commodity could increase and become more competitive. A variety trial was established with the objective of evaluating adoptability and yield, under local growing conditions, of seven varieties of potatoes namely: La rouge, Red Norland, Cal white, Yukon gold, Defender, Cal Red and Granula. These were selected based on necessary characteristics for frying, baking and/or general use.

Carrot : The total production of carrots for 2004 was 569,200 lbs representing a 13% increase over last year's figure. The main varieties planted are Brazilia and Royal Cross. Yields did not change as a 13% increase in acreage contributed to the increase of production. It is expected that the production in 2005 will be better as little incidence of disease has been reported. About 97% of the crop is produced in the Cayo District. The main constraint in carrot production is irrigation, storage and marketing. Attempts were made to organize the Cayo producers but with no success, hence prices could not be stabilized.

Non-traditional vegetables (Cauliflower, Broccoli, Celery, Lettuce): With the exception of lettuce, the production of non-traditional vegetables saw significant increase in production. In all except celery new varieties were released after undergoing field trials with farmers. In the case of the three others except celery the MAF assisted farmers with 50% of the cost of seed as an incentive to cultivate the new varieties which have good consumer acceptance as they are comparable to the imported product. Celery, cauliflower, broccoli and lettuce production were 55,000, 51,560, 10,175 and 31,037 lbs., respectively. This represents an increase in production of 752%, 204%, 70% and –17%, respectively. With the exception of lettuce most of the production is in the Cayo district. In the case of lettuce, the Orange Walk district produces over 70% of the total production as one farmer produces throughout the year.

In terms of varieties the celery variety Bolivar will cease to exist as the Bejo Seed Company will not market this variety anymore. The main varieties of broccoli planted were Packman and Liberty. A new variety known as Gypsy has now been introduced to replace the Packman. The new variety of cauliflower is Majestic that is heat tolerant. The new varieties of lettuce released were: Summertime, Tropical Emperor, Jupiter, Great Lakes and Salinas, Jupiter being the variety that forms the best compact heads. Consumers have a preference for head versus leaf varieties.

Corn & Sorghum: A total of 67.3 million of corn and 17.9 million lbs. of sorghum were produced in 2004. In both cases production decreased by 14% and 11%, respectively. These two commodities are largely used for domestic consumption by the livestock industry and for human consumption. About 95% of the crop is produced by the Mennonite communities. A total of 38,260 acres of corn were planted but 2,458 acres were lost as a result of the severe drought and to some extent rat damage. The production however was enough to suffice the internal demand.

Rice: Rice was affected by the drought, particularly, in the Orange Walk district. A total of 11,648 acres were planted of which 3,678 acres were lost due to the adverse weather conditions. Production of paddy declined from 28.1 million lbs. in 2003 to 23.5 million lbs. in 2004. To offset production 2,000 acres of irrigated rice was planted in Blue Creek in December. There will be no need to import as the production will be enough to suffice the domestic demand. In order to guarantee rice seed supply for 2005 the Taiwanese Mission agreed to extend their rice seed program for another season in the Orange Walk and Toledo districts. Furthermore, the sector is benefiting from the presence of Dr. Robert Shank, a retired USDA plant breeder, who is working on identifying new varieties with desirable characteristics. The formation of the National Rice Technical Committee was also an important milestone in 2004; this Committee meets on a quarterly basis to review and discuss issues related to the rice industry. Of the 65,185 lbs. of milled organic rice produced by the 31 certified producers of the Toledo district, a container with 56,000 lbs. worth $42,000 was exported to Europe by Beltex LTD through the efforts of BMDC. Beltex has a market for 1 million lbs. of organic rice. In 2005 organic rice production will be promoted to new producers and the acreage expanded.

Beans (RK, Black and Other Beans): Total production of beans was 14.9 million lbs as compared to 19.8 million lbs. in 2003. This is broken down into: 2.2 million lbs. of black beans; 6.6 million lbs. of R.K., 5.9 million lbs. of blackeye and 149,000 lbs. of other type of beans. A total of 13,227 acres were planted of which 2,548 acres was black beans; 10,249 acres was R.K beans and 430 acres was other beans. Of the total production of black beans, Stann Creek, Orange Walk and Corozal produced 87% and the Toledo and Cayo Districts 13%, respectively. The Corozal and Cayo Districts produced 57% of all RK bean production; the balance of 47% was produced by the other districts. Blackeye is grown only in the Cayo district and most of it is exported to the Middle East and CARICOM countries.

This year the Caribbean Regional Organization for Standards and Quality (CROSQ) tasked Belize to prepare the Draft CARICOM Standard for Red Kidney Beans. The Technical Committee for Grains and Pulses developed a working draft of the CARICOM Standard for Red Kidney Beans which included quality parameters such as color and bean size. CARDI's capacity was strengthened to provide analytical support via the purchase and installation of complementary seed laboratory equipment. Since funds were not available in time to facilitate the collection of RK beans samples during the 2003/2004 harvest, samples destined for the export market were analyzed with the objective of getting baseline information on the quality of beans exported.

Soybean: The government of Belize through the Development Finance Corporation in 2001 decided to invest in a state-of-the-art soybean processing facility that would produce soybean meal, refined soybean oil and corn meal. After review and some analysis it was agreed that the latter would be removed from the original plan. The facility has the capacity to produce 220,000 pounds of soybean and 20 tons of crude soybean oil daily. The 4 silos have a capacity to store 28 million pounds (12.7 Mt) of grain at any one time. The processing facility is located in Yo Creek, Orange Walk district; the facility was slated to be commissioned in 2004 but due to some delays has now been rescheduled for 2005. A local company by the name of Nutrisoya has expressed serious interest to acquire the facility from DFC. If Belize were to supply all

the soybean grain to sustain its livestock and shrimp industries there would be need to produce in excess of 15,000 acres of soybean. These figures have been the driving force behind the decision to invest in the processing facility.

The main season planting cycle was completed in August. The total number of acres of soybean planted for the main season was 2,072 acres. However, most fields planted with the exception of those planted late in the season were heavily affected by the drought reducing growth and pod formation. The outbreak of two major pests, White fly and Spodoptera worms, made matters worst by completely destroying most fields. Monitoring for pest and disease was ongoing with the application of various recommended insecticides but with no avail. A total of 1,890 acres were completely destroyed with little or no hope of recovering any harvest. A total of 700,000 lbs was harvested from this crop. The October crop was very minimal with a total of 145 acres planted; this crop is expected to be harvested in March, 2005.

Several informal meetings were carried out with potential soybean farmers in the communities of Blue Creek, Little Belize, Shipyard and Yo Creek with the Primary purpose of planning the next planting season as well as organizing the farmers and providing all the necessary information for the future planting cycles. It is important to note that if farmers are to continue producing soybeans at the quantities needed to supply our local demands, they need to access low interest credit as well as to become better informed on the more recent, better yielding varieties including GMO's that are presently in the market. Experimental trials through CARDI, responsible for providing technical assistance to the soybean project, need to be conducted in Belize, addressing these new varieties in order to determine performance in our own climatic conditions and environment.

Financial/technical assistance needs to be available for farmers to continue planting since soybean is a high input crop, which is expensive to establish, especially, now that most inputs prices are on the increase. Therefore, farmers need to be able to borrow from private institutions and from the project itself for their inputs and machinery service.

Cashew: From the 2,300 acres of cashew in production some 316,250 lbs of crude nuts were harvested with an average yield of 138 lbs. per acre. Yields could have been higher if it were not for the above normal wet conditions during flowering and the dry conditions during the development of the fruit. Production for 2003 was 240,800 pounds of crude nuts. About half of total production in 2004 was harvested and processed by four traditional processors. The Maxboro processing factory owned by the cooperative was operational for 26 weeks, during which some 6,400 lbs. of crude nuts were converted into 1,123 lbs. of processed nuts. The decision to close the factory on October 2004, was as a result of poor seed quality purchased and poor conversion rates, coupled with heavy competition from contraband and local processors. In an effort to make the facility viable, the manager, an MAF officer on loan to the Cooperative, spent much of his time distributing the processed nuts at retail outlets. Although this helped to generate income it did not justify having the factory operational. The average price per pound of crude seed purchased was $0.80. The conversion ratio of raw nuts to finish kernel obtained was 6:1 while counties like India and Brazil are obtaining 4:1. The plan for 2005 is to encourage producers to rehabilitate/establish fields with varieties of medium size kernels

and for producers to manage their fields properly to ensure the production of higher yields and better quality nuts.

Fruit Trees : The MAF also placed emphasis in a number of potentially viable fruit trees species, namely, avocado, soursop, mango and sapodilla. The nurseries at the Ag-stations geared up to produce seedlings of improved quality and off-season varieties. The reason for the off-season varieties was to try to have said fruits on the market almost throughout the year. A total of 2,500 assorted fruit tree plants were produced at the Central Farm and Stann Creek nurseries to suffice the local demand. The nursery in Yo Creek was renovated and expanded to provide a greater array and volume of plant species.

1.4.0 Livestock Development

Despite the challenges in production faced by the livestock industry, the value of production experienced an increase of 7.3% from $74.2 million to $79.6 million. The sub-sectors that had the greatest increase were beef cattle, milk and egg production. Pig and poultry experienced a marginal reduction in overall value. Cattle rustling continues to be problematic in some districts. Increased land tax in 2004 contributed to an increase in the cost of production for the larger livestock operations.

In the area of animal health, the livestock sector remained relatively free of major diseases. A countrywide sample survey of over 20,000 heads of pigs carried out by BAHA with assistance from the Ministry of Agriculture confirmed once more that Belize is free from Classical Swine Fever. In horses, however, there were confirmed cases of Venezuelan Equine Encephalomylitis (VEE). A Quarantine containment program was implemented and complemented with vaccination against VEE of the equine population in the affected area. There were also confirmed cases of rabies in equine and bovine species in the Cayo and Orange Walk districts. As a result, an intensive bat trapping program was implemented to reduce the vampire bat population in the affected areas.

The poultry industry enjoyed a year relatively free of major avian disease outbreaks with the exception of Toledo district, which reported avian deaths in local fowls, which BAHA confirmed as suspected Infectious Bronchitis (IB). Nationwide the poultry industry is relatively free of diseases.

Dairy production recorded a 5.8% increment in 2004. Current pressure to reduce fresh milk price at Western Dairies from $0.30 per pound is likely to place a damper on further growth.

Statistical data indicate that the national swine population increased by over two percent; however, swine meat production decreased. This is despite the prevailing price of $1.50 per pound of live-weight paid for pigs on the hoof at the various processing plants.

The implementation of a National Honey Certification program was initiated in conjunction with BAHA and the BIDFOMIN Project. The program included three awareness, familiarization, and training sessions in Food Safety with beekeepers

countrywide. Eighty five bee hives were lost in the Corozal district. Organophosphate and carbamate poisoning has been ruled out. Six Extension Officers and technical staff from other institutions were trained in Beekeeping to provide technical support services to beekeepers nationwide.

A summary of production output performance from the various sub-sectors for 2004 as compared to 2003 is given below:

Comparative Meat Production for 2004 and 2003

Year	Beef lbs.	Pork lbs.	Mutton lbs.	Poultry Dress Weight	
				Broiler – lbs.	Turkey lbs
2003	4,361,850	2,412,240	42,900	30,048,504	353,511
2004	5,859,000	1,719,000	49,350	30,740,883	317,449
Increase/Decrease	+ 34%	- 13.0%	+ 33.0%	+ 2 %	- 10%

Beef Production: Export of live cattle for 2004 increased from 1,186 heads to 2,804 heads, representing a 136% increment. Total beef produced country wide increased by 20% in 2004. Although the majority of beef operations are under extensive production systems, intensive feeding systems are gradually increasing in numbers as a result of increasing demand for quality beef by Belizeans and the growing tourist industry. Furthermore, the number of processing facilities have increased and so the variety of value-added products. Estimated cost per animal per day ranges anywhere from $1.25 to $ 1.50.

In 2004 there was no major disease that affected the national herd except several confirmed cases of rabies in the Cayo district. However its spread was halted via an aggressive emergency plan to vaccinate animals in the infected zone coupled with the control of vampire bats.

Pasture Improvement: Producers continued to invest in pasture establishment/improvement as some 1,797 acres of pasture were improved, 73% in the Stann Creek district. The ministry assisted some small producers with seeds of improved varieties in an effort to assist with the overall nutrition of herds. At the Central Farm station pasture improvement continued as 32 acres of *Brachiaria brizantha* and 12 acres *Panicum sp* were improved, bringing the total acreage of pastures improved to 294 from the total land available of 450 acres. The division of pastures with electric fence and live fencing increased efficiency in animal rotation, weed control and fertilization.

Dairy: Milk production for 2004 increased by 3.9%. Combined deliveries at the two processing plants (Western Dairies and Macal Milk) grew from 7.6 million pounds in 2003 to 7.9 million pounds in 2004. At the same time, processing of milk by small producers decreased from 1.14 million pounds to a 875,000 pounds. Milk price for milk delivered at the various processing plants has experienced a downward trend. Current price for milk is $0.30 per pound, and this is likely to see further erosion. On the other

hand, the price for dairy ration continues to rise thus increasing the cost of production. The reported volume of cream for 2004 increased by 347.7% while the combined total of cheese manufacturing at the processing plants and cottage cheese increased from 216,958 lbs to 253,151 lbs., representing a total increase of 16.7%. With the exception of Stann Creek, all other districts demonstrated positive growth at differing levels in milk and milk by-products.

Comparative Milk Production at the District level for 2004

Year	Corozal	O/Walk	Belize	Cayo	Stann Creek	Toledo	Total Lbs
2003-lbs	715,204	760,000	91,140	5,497,208	216,050	303,750	**7,584,352**
2004 -lbs	806,600	908,472	96,000	5,531,967	153,560	503,000	**7,999,899**
Increase	**+ 12.8%**	**+19.5%**	**+5.33%**	**+0.63%**	**- 2.91%**	**+ 65.6%**	**+ 5.5%**

The large increase in milk from Toledo is because in previous years the milk statistics did not include milk used for cheese.

Feed is an important cost of producing milk hence the Central Farm station sought to find alternative feed sources that would not only increase productivity but also decrease the cost of production. The legume *Dolichos lab lab* was introduced and offered to the milking herd as a protein source in combination with sugarcane. Silage was also made from the lab in combination with chopped sugarcane. As a result the average milk produced per cow went from 23.42 to 28.36 lbs. per cow per day. This technology was shared with dairy producers via field days to the station. In a related topic, calves were fed with medicated powder milk as compared to whole milk as after doing the analysis, it was the cheaper option.

Comparative Milk By-products by Districts (lbs)

Item	Corozal	O.Walk	Belize	Cayo	Stn/Crk	Toledo	2003 lbs	2004
Milk	806,600	908,472	96,000	5,531,967	153,650	503,000	**7,584,352**	**7,999,899**
Cream	13,495	N/A	N/A	30,135	N/A	N/A	**12,178**	**43,630**
Cheese	16066	N/A	N/A	217,667*	19,418	N/A	**216,958**	**253,151**

Includes white cheese processed by small producers.

Sheep: A sharp increase of 33% was recorded on the volume of mutton that passed through the official processing plants. This is indicative of the increased demand for mutton from the various eating houses catering to tourists. Mutton availability has also increased at the various meat shops.

An evaluation of growth performance of Barbados Black Belly fattener lambs under total confinement versus lambs grazed and supplemented was conducted and compared with the performance of lambs under exclusive grazing systems. A qualitative and quantitative evaluation of carcass was performed. The cost per pound live weight gain under total confinement and grazing and supplementation system was estimated. Sheep under total confinement systems gained weight at an average cost of $1.50 or more per

pound with average carcass yield of 53%. Average daily weight gain ranged from 0.3 lb to 0.4 lb. Carcass yield for animals grazed and supplement gained one pound weight at an average cost of over $0.80 with carcass yield of 44% - 45% whereas carcass yields from lambs under exclusive grazing system was only 41% to 42%.

Goats: Three of the four purebred Boer goats introduced in 2003, as the nucleus herd, are still alive. The Boer goat is a meat-type goat. From this nucleus herd over 20 offspring have been produced. Central Farm has procured four milk-type does for cross-breeding with the purebred Boer bucks. Central Farm now has a total of 18 heads of purebreds and some crosses. Over eight producers have benefited from the buck rental service available at Central Farm. The offspring of local goats crossed with the Boer bucks are expected to have superior weight gains and higher carcass yields together with superior carcass quality.

FAO Small Ruminant Project: The first phase of TCP/RLA 3009 got under way with the assignment of Mr. Felix Tzul, Coordinator Livestock Development, as National Coordinator. The project calls for the establishment of four semi-intensive rotational systems of production to increase overall production and productivity in small ruminants (sheep and goat). Pasture improvement and establishment of protein banks and importation of stocks is slated for the year 2005. Other components of the project calls for the training of producers in management skills and animal husbandry practices. The project will conclude on April 1st 2006.

Pig Production: Pig prices remained stable throughout 2004. The national population grew by 2.8% but the total number of pigs processed at the various processing facilities fell from 19,003 heads in 2003 to 16,429 heads representing a 14 % decrease. Total pork volume decreased by 29%. The stability was reflected in the stable price of $1.50 per pound live weight paid for live pigs throughout the year at Running W. This stability was due partly to improved coordination between the producers and processors and an informal market with Guatemala that absorbed around 500 heads of pigs. Estimated return per pig (fattener) not including labor and utility and housing costs at the end of approximately 112 days of the growing period is $100.00. The Guatemalan company PORCASA also exported to Guatemala 175 pigs for breeding purposes. Livestock Extension Officers also assisted BAHA with the Classical Swine Fever and Venezuelan Equine Enchephalomyelitis surveys.

Poultry Production: Poultry continue to be the meat of choice as it is the cheapest and mort accessible. It is also the livestock sub-sector of greatest economic importance. Total number of birds slaughtered increased from 8,168,432 birds in 2003 to 8,588,379 birds, an increase of 5%. Dress weight increased from 30,048,504 lbs. in 2003 to 30,740,883 lbs. in 2004, representing a 3 % increase. The Cayo district continues to be the leading producer of poultry followed by the Orange Walk district. Turkey meat fell from a total of 353,511 lbs. in 2003 to 317,449 lbs., in 2004, representing a decline of

11%. Egg production increased from 2,664,928 dozens to 2,851,257 dozens in 2004, an increase of 7%.

The Belize Poultry Association is one of the most active association, it promotes production and marketing strategies for its product through the current Poultry Project. The Poultry Advisory Council leads the way in formulating National Poultry Health Programs and training programs for its members in its current effort to modernize the industry in preparation for Global Trade.

Egg Production By District(dozen)

Category	Corozal	O/Walk	Cayo	Toledo	2003	2004
Poultry lbs.	2,142,652	11,705,379	14,903,820	21,400	**30,048,504**	**30,740,883**
Eggs (dozen)	426809	943,704	1,466,490	14,254	**2664928**	**28,512,57**

Beekeeping: For the second consecutive year, honey production is on the decline despite all the efforts made by the ministry to revitalize the industry. This shortfall was attributed to a very short honey flow in 2004, which began in February and ended in early April because of the abnormal dry conditions. Production declined from 106,728 lbs in 2004 to 87,356 lbs in 2004. This represents an 18% decline. Sharp decreases in production were experienced in the Orange Walk, Cayo, Belize and Toledo districts.

Honey Production 2004

Year	Corozal	O/Walk	Cayo	Belize	Stn Creek	Toledo	Total
2003	12320	54,450	43,885	3,000	718	**3000**	**106728**
2004	12780	33,615	31,651	1,500	2,500	**1,420**	**87,356**
+/-	+ 35.3%	- 38.2%	- 27.9%	- 50%	+248%	**- 52%**	**- 18.2%**

Pollen output in 2003 amounted to 440 lbs while in 2004 Cayo produced 750 lbs. Beekeepers from the Toledo have expressed interest in the production of pollen for 2005. Most of the effort of the ministry in 2004 was focused on the certification program.

Ten (10) participants underwent intensive training in Beekeeping at a Technical level to strengthen the capability of the Ministry of Agriculture, BAHA and the private sector to provide technical support service. The training was provided by COADAP Cooperative from Peten, Guatemala and was sponsored by the Ministry of Agriculture, BIDFOMIN Project and Just World Partners. The joint project cost was well over $16,000 Belize dollars for a duration of 17 days.

Four consultation sessions to sensitize beekeepers on the requirements and benefits of the National Honey Certification Program were conducted in which 70 beekeepers signed to register under the certification program. Three training session on Food Safety in Honey

were held in Orange Walk, Cayo and Stann Creek. Eighteen (18) beekeepers from districts were trained in the food safety aspects of honey production for the certification program. The Toledo district has not participated in this exercise, but funds are still available through BIDFOMIN.

Genetic Improvement: At the Central Farm Livestock Section, old non-productive dairy cows were culled. Younger stock of superior genetics were procured from Spanish Lookout as replacement, which are now part of the milking herd. As part of the ongoing program for genetic improvement, young selected female are now under retention for final selection after the first lactation. Included is the Sardo Negro X Holstein cross for future evaluation in milk production. The Sardo/Holstein F_1 is exhibiting hypersensitivity in temperament. The six heifers will be backcrossed with Holstein to reduce nervousness.

The combined efforts of the Ministry of Agriculture with the support of small ruminant producers resulted in the introduction of 47 heads of crossbred Dorper sheep from the state of Querretaro in Mexico as part of the national effort to improve genetics in this sub-sector. Two mature rams remained on Government Farms (Central Farm and Stann Creek Agricultural Station) for rental services to sheep producers. The Dorper is a meaty breed that is very fertile with good feed conversion that was developed for arid conditions. Another good attribute is the high value of its skin.

Twenty-Five (25) F_1 queen bees were distributed in the Cayo, Toledo and Orange Walk Districts to encourage queen replacement practices to offset the adverse effects of Africanization and to render colonies more manageable under the National Beekeeping Program.

Animal Nutrition (Feeds and Feeding): The legume *Lablab purpureus* was introduced as an alternative source of plant protein to supplement and improve basal diets. Lablab was evaluated for its palatability, biomass production and its potential as a partial substitute for commercial concentrate. Biomass production was estimated at 22,000 lbs. per acre of high quality nutritious forage. It replaced over 25% of the daily dietary concentrate ration without significant change in milk production.

Nine small-scale dairy producers participated in a field day designed to demonstrate the preparation and feeding of lablab to dairy cattle. Each participant was given five (5) pounds of seed to establish small plots. *Clitoria ternatea* and *Vigna unguiculata* forage legume species were not evaluated as programmed because of the unavailability of seeds. However, a source has been identified in Mexico with a branch in Chetumal City.

The performance of Barbados Black Belly sheep under complete confinement and fed with commercial beef fattener was evaluated. Their performance was compared with that of grazed and supplemented sheep and those sheep under exclusive grazing system. Carcass quality and yield were significantly improved. Sheep under complete confine had carcass yield ranging between 45% and 53%; sheep grazed and supplemented had carcass yield ranging between 42% and 45%; sheep under exclusive grazing had carcass yield ranging between 42% and 44% but of significant inferior quality. The average cost of one-pound weight gain for sheep under complete confinement was over $1.50 per

pound. However, the carcass under the intensive system of feeding fetched up to $6.00 per pound wholesale price. Hence, intensive feeding systems for sheep production have to include value adding and innovative marketing strategies to make it profitable.

1.5.0 Other Agriculture Development

School Garden: The school garden program continue to expand with new schools joining the program. In most cases each Extension Officer works along with two school gardens. The levels of success vary as some schools have water supply problems and others suffer from praedal larceny. Most schools have established, from the sale of produce, a revolving fund mechanism from which inputs are procured for subsequent crops. The school garden program is promoted and supported by the ministry as we want to be part of the process of developing in kids, from an early stage, their interest in agriculture and their appreciation for feeding themselves and the nation. It also nourished the sustainability of the existing school's canteen programs through gardening for the production of food crops. Three of seven schools are well underway in supplementing their canteen programs while the others are coming into the productive stages.

National Agriculture and Trade Show: If it were not for the inclement weather the 2005 fair would have been the biggest and most attended to date. The 29th fair was held on the 14-16 of May with the theme"**Agriculture: Maanin, Noon and Nite**". The traditional activities like the: Miss Agriculture contest, crops and livestock exhibits, petting zoo, flower show, dog show and the rodeo, were all part of the fair. Other new events included: horse and cart rides, mud bike competition, miniature tractor rides, among others. The Senior Farmer of the Year award went to Mr. Lucio Sho from San Jose Toledo, the Lady Farmer to Mrs. Aurora Manzanero from Stann Creek and the Junior Farmer to Mr. Edward Castro from the Belize district.

Research and Development: The National Coordinating Committee for Agricultural Research and Development (NCCARD) was officially launched on 9th September 2004 with the mandate to spearhead the national research program. The founding members agreed that the best strategy was to have a small core group as compared to the large groups in the past that did not function. The core members of the committee represent the following institutions: CARDI, UB, BSI, IICA, ROC Mission, MAF and CREI. Some of the accomplishments include: approval of the TOR, prioritization of commodities, prioritization of the nine thematic areas of work, the formation of sub-groups based on thematic areas and the drafting of work programs by some of the thematic sub-groups.

Mechanization Services: The Mechanical unit continued to pursue a vigorous preventive maintenance program by insisting in timely maintenance and inspection of all MAF vehicles.. The unit also continued served as resource centre by providing training for young apprentices at Janus Foundation and at the Center for Employment Training (C.E.T.). This year cooperation was strengthened with the University of Belize's Faculty of Agriculture and Natural Resource Department (FNAR) through the provision of training in tractor and vehicle mechanics and the operation of farm machinery. Of the 277 farmers that received services 256 was for ploughing. The bulldozer service provided services for 26 farmers on 231.5 acres.

Soil and Water Technology: Provision of technical assistance in soil and water conservation are now under the Extension Department of the MAF. Under this program seven family drip system (FDS) were delivered to seven schools of which six (6) have been installed. In an effort to strengthen and expand this service in the southern district the irrigation technician from Central Farm was transferred to the Stann Creek district.

Vegetable Seedling Nursery: The vegetable seedling nursery was a new initiative at Central Farm. This service was based on the principle that short term crops especially vegetables, need to be grown initially under protective cover to ward the treat of white flies and other soil borne diseases. Farmers now have access to healthy and robust seedling of the crop they choose. This new initiative started in June of 2004 and has seen a gradual increase in the number of plants produced for farmers. Crops to date being produced include broccoli, cauliflower, sweet pepper, hot pepper, tomato, cabbage, basil, celery, spinach, baby onion (chives cebollin) and parsley. This service is expected increase in 2005 as the news is spreading within the farming community. Total seedlings produced in 2004 were 9,859 vegetable seedlings. Due to the success of this program a more rustic unit is being constructed at the Yo Creek station in Orange Walk to provide this service to the northern districts.

Agro-forestry: The ministry does not actively promote agro-forestry but the nursery at Central Farm provides seedlings for sale at reasonable prices. In 2004 there was a major increase in the amount of agro-forestry seedlings sold. Many growers have been planting forest trees on a commercial basis, in particular teak (*Tectona grandis*). A total of 1,896 teak seedlings were sold, representing 70 % of the total population sold.

Capacity Building (Ag. Extension Services): Twenty trainings and workshops were carried out in 2004. Training for extension officers included: logical planning techniques, problem identification, project writing, pesticides use, performance appraisal, good agricultural practices, quality standards for fresh produce. Eight officers also started a course in "small business entrepreneurship" offered at GALEN University. Among the trainings conducted for farmers included: vegetable production, pesticide use and disposal of pesticide containers, cocoyam cultivation, food safety standards, and efficient and effective use of water for agriculture. Four officers attended oversees trainings, workshops or conferences, namely: small scale irrigation in Antigua; science, technology and innovation workshop held in Dominica; Good Agricultural Practices held in Trinidad and Tobago and issues in Global Water Partnership held in Belize. Lastly, one extension officer pursued a three-week training course in agro-processing at the ROC Technical Mission, Central Farm. A school forum was also convened with forty-five stakeholders to develop strategies to include agriculture in the curriculum of schools. This was as a follow-up to the Telefood project addressing the production of vegetables for the school canteen program at selected institutions.

The Extension Service was instrumental in the formation of the Corozal Agriculture Producers Association (CAPA) and the Orange Walk Vegetable Producers Association. They also assisted farmers in obtaining credit for agricultural activities from Saint Francis Xavier Credit Union. The Extension Service was also involved in carrying out a climatic

impact assessment for the entire country. The assessment showed that the hardest hit district was Toledo where losses were estimated at $1.5 millions; about 98% of the losses were incurred by the Maya Indian communities. These losses were mainly due to climatic variability and pests such as rodents.

Agro-processing: Agro-processing is a dynamic and fast growing sector that has the potential to provide opportunities for income generation and employment. It also plays a very important role in the nutritional status of the population. More than fifteen different products is being promoted. In 2004 more than 100 individuals received training at the agro-processing lab at Central Farm. Training was offered in the preparation of jams, jellies, dried fruits, natural juices (carambola, pineapple, grapefruit, mango, guava) ginger powder, cheese, yogurt, vinegar, coco yam chips, potato chips and vacuum fried chips. New products in the market are yogurt, honey jam, honey peanut jams, natural juices, special jams (guava, black berry, crabboo) coco yam chips, sweet potato chips and bread fruit fries. Several training sessions were held to assist processors improve the quality of white cheese. White cheese consumption has increased tremendously as the quality of product has improved substantially; its distribution in stores has also expanded. In the case of the Cayo district on average 1,800 pounds of white cheese is sold monthly by small processors.

Another of the initiatives of the program was the establishment of display racks at key business places. The food racks are used exclusively for the promotion and marketing of locally produced agriculture value added products. The average sale at one of the site was $500 per month. The program also assisted Mr. Antulio de la Fuete with the design of his labels and improved the shelf life of his fresh orange juice by dipping the bottle in cold water prior to putting in the refrigerator. Jointly with the Extension Officers, BAHA and OIRSA four training were held on Food Safety, Food Handling and Food Standards in order to educate agro-processors throughout the country on producing wholesome products of high quality. A new activity was the development of cost of production for the processed products in order to determine viability together with the wholesale and retail price to consumers. The Taiwanese mission imported several new equipment that included: pineapple peeler, roaster, fruit slicer, broiler and steaming set for an industrial size vacuum fryer. The section also participated in an exercise to evaluate agro-processing opportunities for the Toledo district.

Projects : Thirty-three projects were undertaken in 2004. Three CARTF funded projects were completed in collaboration with agribusiness cooperatives in the Belize and Stann Creek districts for the development of cashew, pineapple and cassava-based animal feed production, processing and marketing. Five other projects that came to a close in 2004 included an FAO funded Telefood school gardens project and two Technical Cooperation Projects (TCP), one on forest health and the other on phyto-sanitary strengthening. The other two were the ROC funded construction of five onion storage facilities and VIFINEX. The latter was a five year regional phyto-sanitary surveillance project which assisted in the development of all aspects of the hot pepper industry in Belize. Funding for 21 on-going projects in the areas of agricultural strategy, food security, small ruminants, data collection, marketing, rural development, banana support, bio-safety,

cashew, soybean, coconut, school gardens, bee-keeping, grain storage, vegetable production and agricultural health came from FAO, Govt. of Italy, EU, USDA, CDB, IFAD, IDB, OIRSA, UNEP, ROC and GoB. The FAO/Govt. of Italy funded Food Security project was the most encompassing for the agriculture department, demanding the dedication of several of the extension staff in the five districts where the project was executed.

The financing proposal for the Belize Rural Development Project was finalized; this five year 9th EDF funded project is expected to commence in mid 2005. At the end of 2004 four projects were in the pipeline for FAO funding, one TCP on Bio-security and three Telefood projects on onion storage, pineapple seed propagation and crop/livestock expansion for the Youth Hostel.

2.0 FISHERIES DEPARTMENT

The mission of the Belize Fisheries Department is *"to provide the country and the people of Belize with the best possible management of its aquatic and fisheries resources, with a view to optimize the present and future benefits through efficient and sustainable management"*. Through this mission, the Department continues to provide the stewardship for the steady development of the sector to contribute significantly to the Belizean economy and at the same time ensuring that the integrity, productivity and sustainability of our ecosystems is not compromised. The mandate of the Department is executed through its three main programs which are the Capture Fisheries, the Aquaculture and Inland Fisheries and the Ecosystems Management Program. In 2004, the Fisheries Sector contributed significantly to Belize's Economy with export earnings valued at approximately $107.4 million.

Capture Fisheries: Fisheries production for the year 2004 showed an increase of 2.6%, 17.3%, 41.98%, 728.2% and 1.64% for lobster tail, conch meat, marine shrimp, crab claws and lobster head meat respectively. However, the production for Fish Fillet/ Whole fish (excluding Tilapia fish/ fillet) showed a decrease of 30.21% and 2.4%, respectively. Lobster head meat and crab claws were marketed and sold primarily to the local tourism sector. The decrease in fin fish production could be a reflection of the inability of the data collection system to adequately capture fin fish sold directly to the tourism sector. In 2004, fin fish received by the fishing cooperatives was very small compared to previous years, since these cooperatives are the primary source of data collection, the statistics reflected a decrease in finfish production. This decrease may not be an accurate reflection of production given that most of the finfish production is now being sold directly to the tourism sector.

Shrimp Farming: At the end of 2004, there were 14 shrimp farms in operation with 6,888 acres of production ponds. These included: Caribbean Shrimp, Nova Ladyville, Crown Shrimp, Paradise Shrimp Farm, Triton Mariculture, Haney's Shrimp Farm, Belize Aquaculture Limited, Royal Maya Shrimp Farm, Crustaceans Shrimp Farm, Texmar, Aquamar, Nova Toledo, Toledo Fish Farm Limited and Melinda Mariculture.

Preliminary assessments for 2004 on the amount of farmed shrimp produced is close to 34 million pounds of whole shrimps, which translated to roughly 22 million pounds of shrimp tails, the primary marketed commodity. The market price of exported shrimp has declined sharply over the last 3 years. In 2004 the estimated export value for farmed shrimp was Bz$85.1 million, which represent a decrease of 8.1% relative to 2003.

Shrimp Production and Revenues

Year	No. of Farms	Area Farmed	Export (Tails)	Export Revenues Bz$
1994	5	1,000 Acres	1,311,427 lbs.	$ 8,689,352
1995	6	1,100 Acres	1,168,822 lbs.	$ 10,401,100
1996	6	1,100 Acres	1,574,283 lbs.	$ 8,900,000
1997	6	1,370 Acres	2,710,967 lbs.	$ 13,566,522
1998	6	1,394 Acres	3,620,151 lbs	$22,596,572
1999	8	3.100 Acres	6,974,120 lbs	$46,007,000
2000	12	5,188 Acres	5,027,352 lbs	$47,458,117
2001	11	5,818 Acres	7,127,374 lbs	$48,738,671
2002	12	6,588 Acres	6,263,223 lbs	$51,793,845
2003	13	6,788 Acres	16,051,000 lbs	$92,762,000
2004	14	6,888 Acres	16,999.000 lbs	$85,153,000

Finfish Farming Operations: The production area for small-scale fresh water aquaculture is 15 acres with mostly tilapia species being farmed. For the commercial scale freshwater aquaculture, there are currently 140 acres under tilapia production. Estimated tilapia exports for 2004 to the US market have been placed at 259,000.00 pounds of fish fillet with an export value of BZ$1.224 million.

Whole fish and fillets from Fresh Catch Ltd

2.1.0 CAPTURE FISHERIES

The Capture Fisheries Unit (CFU) is the arm of the Belize Fisheries Department responsible for providing the necessary legislative and management interventions to facilitate the continued development and proper management of Belize's marine fisheries resources. In 2004, important resource assessment exercises were carried out on the lobster (*Panulirus argus*), conch (*Strombus gigas*), shrimp (*Penaeus notalis*) and snapper (*Lutjanus analis*) populations in our Belizean waters.

Lobster Fishery: The lobster production of Belize has remained stable over the last 8 years ranging from 450,000 to 500,000 pounds (lbs) per year. In 2004, total production amounted to just over 547,000 lbs of lobster tails and over 50,000 lbs of lobster head meat.
Analysis in 2004 by the Department and fisheries scientist Paul Medley reports a clear decline in Catch per Unit Effort (CPUE) during the fishing season and an increasing trend in recruitment and fishing mortality. The average fishing mortality rate is high and it is estimated that as much as 54 % of the stock is removed in each fishing season. However, significant declines in annual production volume have not been observed over the last decade which may infer that the current fishing effort currently being exerted on the resource is manageable if not reasonably sustainable.

Fisherman cleaning catch for the day

Conch Fishery: In September 2003 Belize was placed in the Category (ii) list of countries, which focused on "species of possible concern by the Convention for the regulation of International Trade in Endangered Species (CITES). This notification gave Belize one year to carry out various assessments on its conch resource and to report to CITES on the current status of the stock and the efficiency of its management systems. In September of 2004, the national report on Belize's conch fishery was submitted to CITES Secretariat in Geneva, Switzerland.

The studies carried out estimated a population of legal-sized individuals of 6,019,652 and an individual mean conch weight of 170g. The MSY using the Schaeffer Model was estimated at 324 mt (712,601 lbs). Conch production has remained fairly stable over the

last 5 years in Belize ranging from 141mt in 1999 to 240 mt in 2003. The 2003 conch production level is below the estimated MSY.

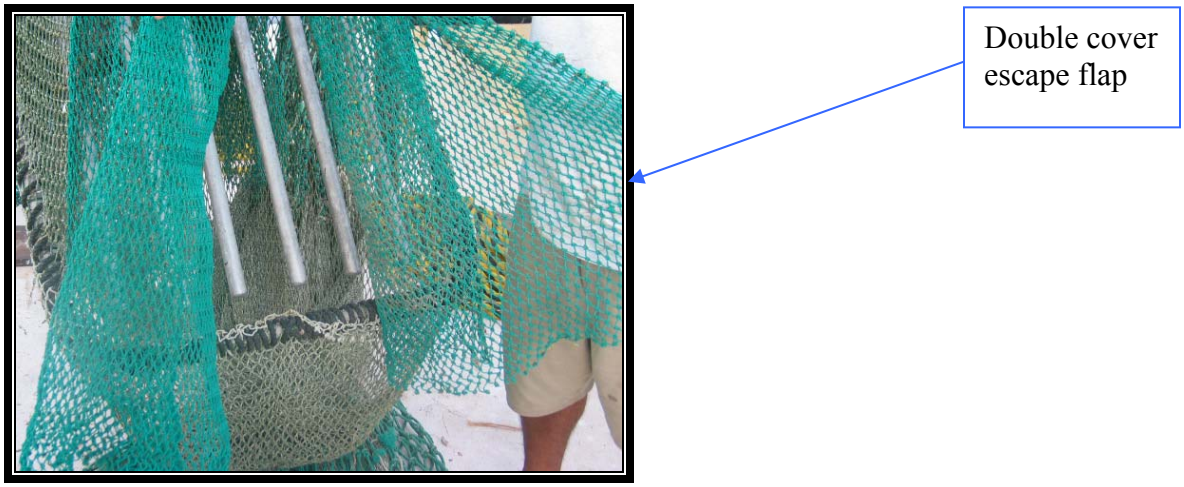
Considering the precautionary principle and since conch production is lower than the MSY, the Belize Fisheries Department has established a cautious catch quota equivalent to the current production volume of 240mt (528,000 lbs), which is nearly 75 % of the MSY but which is a reasonable exploitation level considering the significant growth (almost 3 times) of the conch population from 1996 to 2003. The Belize Fisheries Department has also established a conch export quota of 228mt (501,600 lbs) per year. This export quota is separate from the local consumption quota of 12mt per year.

The conch catch and export quota will be reviewed on a bi-annual basis and adjusted accordingly. Catch and export quota estimates will be forwarded to CITES every 2 years and will be based on the results of the bi-annual conch surveys that will be carried out to gather the conch field data to estimate conch abundance. This information will be forwarded to CITES through the Belize - CITES Managing Authority on a timely manner.

The studies confirm the effectiveness of the current conch fishery management strategy of Belize. The existing conch regulations will be maintained. However, given the open access nature of Belize's fishery (currently there is no upper limit on entry to the fisheries sector), the imminent increase in the fishing pressure (as a result of changing world trade in sugar and other events) coupled with the established catch and export quota, then there is a need more than ever before to identify opportunities to control or reduce the fishing pressure; in view of the fact that a gradual and sustained increase can threaten the sustainability of the local conch population and may lead to over-fishing.

Shrimp Fishery: The general results of an assessment on the shrimp fishery done in 2004 suggested that the shrimp stock is over fished and has been over fished since the 1980's. The current catches are well below the estimated maximum sustainable yield and the implication is that too many vessels have been given access to the resource and the shrimp population has been kept well below the state where it maximizes productivity. The decision analysis indicates limiting the number of vessels participating in the fishery to 4; this would allow the recovery of the stock by 2011.

On August 2003, the National Marine Fisheries Service (NMFS) of the United States of America (USA) officially adopted new regulations concerning the use of Turtle Excluder Devices (TEDs) on commercial shrimp trawlers. Belize is currently complying with the proper installation and use of the TED and is, therefore, qualified to export wild caught shrimp to the USA. One of the major modifications was the inclusion of a double cover escape flap, which allowed large turtle to escape more freely. Figure 8 shows the double cover escape flap adapted to the TED to avoid turtles getting trapped in the net.



Fisheries Officer inspecting the TED on a shrimp trawler

High Seas Fishery: On January 1st 2004, the trade sanctions imposed on Belize by ICCAT member countries for the exportation of Blue Fin Tuna, Swordfish and Big Eye Tuna were lifted. Belize continues to make improvements in the management of its High Seas Fishery and was successful in maintaining its current position at the 19th Regular meeting of the International Convention for the Conservation of Atlantic Tuna and Tuna-like species (ICCAT) held in November 2004. It is planned that Belize will become a member of ICCAT before the upcoming meeting in 2005 and that Belize would be in a position to negotiate modest quotas for those species that require one.

Fish Aggregating Devices (FADs): In 2004 members from the Capture Fisheries Unit initiated phase II of the FADs project. This project is funded primarily by the Caribbean Regional Fisheries Mechanism (CRFM) and the Fisheries Department. The Main objective of the FADs project is to determine the best model for FADs in Belizean waters and to investigate the future potential of FADs as an alternative fishery for our local fishermen. The FAD was constructed and deployed south east of Rendezvous Caye in December 2004 and the monitoring of its performance is scheduled to continue in 2005 with the partnership of the Belize Sports Fishers Association and the CRFM.

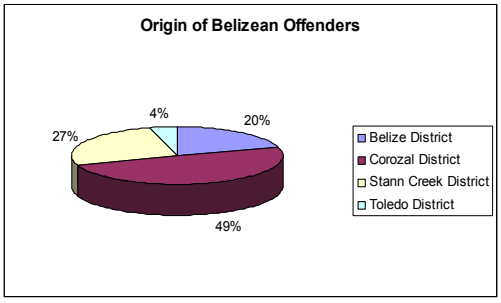
Public Education Program: In 2004, the Capture Fisheries Unit Initiated an education program for the primary and secondary schools of Belize. The program focused primarily on the fisheries sector, the management regime in the sector and the role of the general public in contributing to the sustainability and integrity of our fisheries and marine resources. This program has been well received by the 11 schools it targeted; the Department intends to continue in the southern and central districts in 2005. The Unit also continued with its ongoing education and sensitization of stakeholders in the fisheries sector. Several presentations were made at various workshops by the BFCU on the status of the commercially important species.

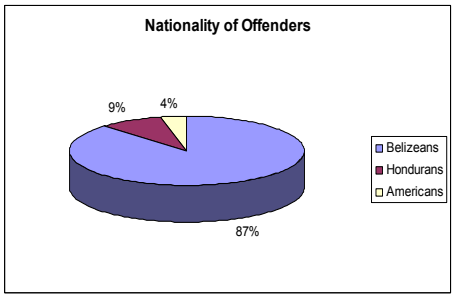
2.2.0 ECOSYSTEMS MANAGEMENT

The Ecosystems Management Unit (EMU) of the Fisheries Department consists of the marine reserves and the Conservation Compliance Unit (CCU). The new management

paradigm has shifted from specific species and site protection to the protection of entire ecosystems and the regulation of the activities within those systems.

Enforcement: Patrols were prioritized in order to cover illegal activity hotspots and be able to intercept marine products landed at receiving stations. The Fisheries Prosecution had fifty-six convictions out of sixty-seven arrests contributing $112,698.00 in fines and penalties to the general revenue. Eighty-seven percent of the offenses were caused by Belizeans, 9 % by Hondurans and 4 % by Americans.





The most frequent offense was illegal fishing for conch. The largest group of Belizean offenders (49%) came from the Corozal District; this is as a result of Sarteneja Village having the largest number of fishermen in the country. Personnel from the different marine reserves also contributed significantly to enforcement by making 44 % of arrests.

Synoptic Monitoring Program (SMP): The SMP looked at seagrass and mangrove productivity as well as coral reef health in 2004. The data was collected in all marine reserves and will be inputted into the Regional Environmental Information System (REIS) database created by the MBRS to facilitate the SMP. Analysis on the data for 2004 will commence in 2005 and the results will be shared with the other MBRS countries.

Spawning Aggregation Monitoring: The staff from the various reserves and CCU participated in the national grouper aggregation monitoring for all months in 2004. This was a joint effort by the Grouper Spawning Aggregation Monitoring Working Group and funded by The Nature Conservancy, WWF and MBRS. The preliminary results from the SPAGS monitoring program were made public in the first newsletter issue in January 2004. Subsequent issues outlined the progress made. The holistic SPAGS data will be analyzed in February 2005 and made public.

Turtle Monitoring : Monitoring of turtle nesting sites continued at all the reserves and at the Gales Point area. Mr. James Azueta, turtle scientist, traveled to Costa Rica to attend the first scientific meeting of the IAC. The scientific committee designed a reporting format for the member countries, drafted the scientific committee's terms of reference, made a declaration for the Inter-America Convention for the Protection & Conservation of Sea Turtles (IAC) for the Leatherback Turtle and created a work plan for the next two years.

Mr. Isaias Majil, Belize's Focal Point to the IAC, along with Mr. Rennick Jackson attended the Convention of Parties (COP 2) which was held at Islas Margaritas in Venezuela in October 2004. The Parties ratified the work produced by the scientific committee and dealt with other matters.

Environmental Impact Assessments and Research Licenses: The Fisheries Department again played an important role in the National Environmental Appraisal Committee (NEAC), which assesses and approves Environmental Impact Assessments (EIAs). The biggest contribution was made on coastal and marine developments where the department participated in 14 site visits and reviewed 12 environmental impact assessments for the NEAC. Marine research licenses granted in 2004 were primarily for research on corals, fish, invertebrates, and mangroves. A total of 10 research permits were granted in 2004.

Public Education Program: Environmental education activities and community public forums were regular at all the marine reserves especially at the Hol Chan Marine Reserve. Hol Chan was also granted a PACT grant to expose 200 children from San Pedro Town, Ambergris Caye, to the reef environment. Some of the major activities were field trips and resource materials provided to the children of San Pedro. In order to capitalize on resources, the EMU office will schedule and coordinate this program in 2005. This coordination will avoid duplication and at the same time build team work with the staff from the different reserves.

2.3.0 AQUACULTURE & INLAND FISHERIES (AQUIF)

The mission statement of the Fisheries Department guides the overall mission for aquaculture development which reads as follows: *"To guide the development of a competitive aquaculture industry while at the same time maintaining the viability of the environment and providing responsible stewardship for inland fisheries resources of the nation as well as the ecosystems that supports them, in order to provide sustainable benefits for Belizeans of present and future generations".*

Finfish Farming Operations: The Northern part of Belize continues to be the area where most of the interest in fish farming has been concentrated, however after the fish farming seminar in March, some interest has arisen in the southern part of Belize. This year an order for fingerlings was received as far south as Sittee River. Tilapia continues to be the species with the highest demand due to its fast growth rates and market demands. The Mennonite community in Shipyard and Little Belize have interest in fish farming, as well as, other Cooperative groups and individual cane farmers in the districts of Corozal and Orange Walk. A total of 15 farmers with 5 acres of production ponds were supplied with mostly tilapia fingerlings. The revenues generated was deposited to the AQUIF Unit funds, and has assisted in the purchasing of operational supplies for the farm such a fuel, feed, white lime, fertilizer, oxygen cylinders, and packing supplies. The revenues generated were also critical in sustaining the repairs and maintenance of equipment.

The Biscayne Seed stock Production Facility has seen some improvements in regards to infrastructure and the purchasing of supplies and equipment. As a result, seed stock production has increased from 26,500 in 2003 to 45,000 in 2004. This represents over 170% increase when compared to 2003 production.

Extension & Public Education: The Development of the aquaculture sector of Belize is another major role of the AQUIF Unit. Some of the activities that support this task include in-house technical advice, site assessment and on-site husbandry advice to farmers. These activities generally entailed assessing site suitability and feasibility for both small and large-scale aquaculture ventures.

Due to the high interest in aquaculture ventures in Northern Belize, most of the site visits were conducted with potential fish farmers in this part of the country. These have been mainly in the Mennonite communities of Shipyard and Little Belize. Also in coordination with the Cooperatives Department several meetings and site assessment visits were conducted with Farmer's Cooperatives in Yo Creek, Patchakan and Sarteneja Villages as well as follow-up meetings with individual farmers and farmers' cooperatives of Douglas. Few site visits were conducted in relation to the on-going aquaculture projects.

Regarding in-house consultation with the public, most of the farmers assisted were those planning to venture into fish farming. These farmers were provided with the necessary technical advice, which included the synthesis of economic modules for their proposed operations. With respect to progress on fish farming ventures, the AQUIF Unit also conducted follow-up visits to advise on husbandry procedures, engineering considerations, disease management and market considerations.

Inland Freshwater Species & their related Habitats: The months of February to June are the most active in terms of fishing activities in inland water bodies; hence these are the months that the AQUIF Unit conducts most of its enforcement activities. This period sees a significant increase in reports of illegal fishing activities amongst which the use of gill nets and the harvest of hicatee are the most prominent. Other areas patrolled include Mid-winters Lagoon for illegal netting. The general approach regarding the enforcement activities have been one of education and as a result, most persons encountered in the areas patrolled were informed of the fisheries laws with respect to inland waterways. The Department made several consultations with stakeholders in the Belize River Valley area to address the illegal net fishing in the mussel creek area. A very productive

partnership has been formed with these communities in the monitoring and management of the area. On the basis of this consultation a draft fresh water legislation has been developed and put on the table for review by the Ministry of Agriculture & Fisheries.

PREPAC: The Unit was actively involved in the inventory phase of the PREPAC Project. During this phase, which started in August, information was gathered on all the major inland lagoons and reservoirs of the Country. Most of the activities entailed a site visits to the water bodies and the communities surrounding them.

2.4.0 National Initiatives

National Protected Areas Policy and Systems Plan Project (NPAPSP): The National Protected Areas Policy and Systems Plan Project was officially launched on May 5, 2004, for which a Taskforce was appointed by the Deputy Prime Minister to oversee its implementation. The Fisheries Administrator is an appointed member of this task force. The primary work of the Task Force in 2004 was the mobilization of resources for implementation of the work plan completed in 2003 and the overall monitoring and supervision of the implementation of the work plan.. The work plan's specific purpose is to guide the formulation of the National Protected Areas Policy and Systems Plan. The Work plan sets out five results which are the intended goals of the planning process. The overall budget for the policy development and planning process, inclusive of project administrative and logistical cost was calculated to be $1.17 million. Most of the monies were raised; three of the five results were being finalized by December of 2004. It is anticipated that the project will be able to present to the stakeholders and cabinet all the results of the work plan by the end of summer 2005.

The Task Force has also been in dialogue with the World Bank who has express great interest in submitting a project on behalf of Belize to the Global Environmental Facility for project development funds (Block B) to elaborate a multi-year project (5 years) geared at implementing the key recommendations of the NPAPSP.

Implementation of Visitation Fees for Marine Reserves: In November of 2004, the Fisheries Department implemented the collection of a visitation fee for all marine reserves under its management. As a result, revenue collection continued at Hol Chan Marine Reserve, Glovers Reef Marine Reserve, and Gladden Spit & Silk Cayes Marine Reserve and commenced at the Bacalar Chico Marine Reserve, Caye Caulker Marine Reserve, South Water Caye Marine Reserve and Port Honduras Marine Reserve. The initial fee collected for all the marine reserves was $20 Bze as mandated by Cabinet in February of 2004 and implemented on November 1, 2004. However, the entrance fees were later reduced to $10 for all marine reserves except Hol Chan and Sapodilla Cayes. Visitation fees will be crucial for the 2005 fiscal year given the inadequate budgetary allocation by Government of Belize for the management of these reserves.

2.5.0 Regional Initiatives

(i) OSPESCA

The Regional Fisheries and Aquaculture Organization for Central America headquartered in El Salvador was very active in 2004. Some of the major initiatives involving Belize were:

PREPAC Project which is the Regional Plan for Continental Fisheries and Aquaculture in Central America. The project is funded primarily by the Republic of China in Taiwan and consists of three phases geared towards the realization of national plans and the implementation of sustainable aquaculture and fisheries initiatives in countries. Belize completed Phase I of the project which resulted in the inventory of all the continental water bodies in its territory. In 2005, it is anticipated that Phase II, which is the characterization of potential water bodies for possible development of pilot projects in sustainable aquaculture and fisheries, will be initiated and completed.

The Food and Agriculture Organization of the United Nations in partnership with OSPESCA have embarked on an initiative to develop National Action Plans to comply with the FAO Code of conduct for Responsible Fisheries. Under this initiative, Belize has been participating in various OSPESCA in order to elaborate its National Action Plans in the areas of Fishing Capacity, Shark Fishery and on illegal, Unregulated and Unreported Fishing Activities. Belize has nominated a national team comprising of personnel from the Department to participate in the various sessions and who will eventually work on the consolidation of all national plans into a regional action plan.

Regional Fisheries and Aquaculture Policy for Central America :Heads of Government through the Central American Integration System (SICA) directed the OSPESCA Secretariat to coordinate the formulation of a regional fisheries and Aquaculture policy for the Central American Region. Belize has given its input into the draft document which would be consulted on by the various stakeholders of the sectors in 2005. The Fisheries Department has also appointed a representation to sit on the regional fisheries policy committee which is expected to guide the formulation, endorsement and implementation of this regional policy.

(ii) Mesoamerican Barrier Reef Systems Project (MBRS):

Marine Protected Areas: The year 2004 marked the mid term period in the life of the MBRS Project. The project executed its work plan efficiently and received a very good evaluation from the World Bank project evaluation team. The year 2004 was very active for the MBRS with major investments in the infrastructure at the Bacalar Chico Marine Reserve through the construction of a multi-use building to house the reserve staff , visitor center and reserve activities. A brand new building is scheduled to be built on Hunting Caye in 2005 to house the Sapodilla Cayes Marine Reserve Staff and their activities. The 10 year master plans for the Corozal Bay Wildlife Sanctuary and the Sapodilla Caye Marine Reserve were produced and presented to the stakeholders of these areas for their input. The finalizations of these documents are scheduled to be completed in early 2005. In December 2004, Ministers of Fisheries, Tourism and the Environment

of Belize, Guatemala and Honduras signed an agreement for the adoption and implementation of Transboundary policies in the Gulf of Honduras in Fisheries, Tourism and Marine Protected Areas.

Synoptic Monitoring Program: The field work for the Synoptic Monitoring Program was implemented in Belize; staff in the Marine Reserves and the Fisheries Department collected data for 12 consecutive months on Fish populations, sea grass and coral reef health. It is expected that the data will be analyzed in early 2005; the results will be posted on the Regional Environmental Information System. Investments in equipment and training was provided to the staff of the reserves and partnering organizations in the synoptic monitoring program. The Fisheries Department's offices received direct assistance through the provision of computers to facilitate the housing of the databases supporting the synoptic monitoring program.

Promotion of the Sustainable Use of the MBRS Resources: The Spawning Aggregation Monitoring Protocol was formally adopted by the Fisheries Department; Department staff together with staff from organizations on the National Spawning Aggregations Working Group conducted monitoring of aggregation sites. The monitoring will come to an end in mid 2005; thereafter, a report characterizing the sites will be produced. Funding was also provided by The MBRS Project for training of fishermen and individuals from coastal communities in alternative livelihoods. The training was provided by non-governmental organizations working along with the Fisheries Department. Green Reef and Toledo Institute for Development and Environment (TIDE) provided training in nature tour guiding, kayaking, fly-fishing and SCUBA diving to eighty-four fishermen. The fishermen were identified by the Fisheries Department with assistance from the various fishing cooperatives and village council leaders. Finally several exchanges were done between fishers from Belize and Mexico to look at their different experiences in the conch and lobster fisheries. The MBRS also funded a technical exchange to build capacity in the Capture Fisheries Unit in Lobster Stock assessment.

Environmental Education: Video spots were aired on the local television stations in Belize highlighting the great biodiversity and importance of the MBRS to the people of Belize and the region. It is planned that these video spots will be produced in Garifuna, Ketchi and Maya in order to reach even more stakeholders in the MBRS region. Educational videos were produced and distributed by Toledo Association for Sustainable Tourism & Empowerment (TASTE) and the Fisheries Department in order to integrate their ongoing educational programs. Five National workshops were held in Belize to train teachers on the integration of the marine ecology curriculum produced through the MBRS into current national curriculum for primary and secondary schools.

(iii) Caribbean Regional Fisheries Mechanism (CRFM)

Common Fisheries Regime and Policy for the CARICOM Region: Heads of Government of the Caribbean Community, at their Fourteenth Inter-Sessional Meeting in Trinidad and Tobago in February 2003, deliberated on the adoption of a Common

Fisheries Regime. This discussion was prompted by a proposal submitted by the Government of Barbados, which gave a historical account of regional collaboration in fisheries development and management and of the principles being pursued under the CARICOM Single Market and Economy (CSME) should not be limited to goods, services, capital and labour in respect to the land mass of member states, but should also include the marine space of countries. It was agreed that the Caribbean Fisheries Mechanism (CRFM) which was formally inaugurated on March 20th 2003 was now in a position to provide regional leadership with regard to the mandate of the Heads of Government since it comprised technical and policy advisory personnel on fisheries matters, in the Region. Thus far a fairly decent and comprehensive Draft Common Fisheries Policy and Regime (CFP&R) has been prepared which has been the substance of the discussions of the 2nd and 3rd Working Group Sessions held in 2004; it is also expected to be the focus of the 4th Working Group Meeting slated for April 2005; national consultations are scheduled for February 2005.

CRFM Resource Assessment Workshops: Regional workshops were convened for fisheries scientists' resident in Fisheries Department in the CARICOM Region to analyze data collected in 2003 and 2004 and to provide an assessment of the stocks. These workshops served as the vehicle for the assessments done on the Belize marine Shrimp and Lobster populations.

Formulation of Fisheries Management Plan for Belize: In 2004, the CRFM agreed that it would assist Belize in the formulation of a National Fisheries Management Plan. The CRFM committed resources for technical assistance during the formulation process and for the national consultative phase of finalizing the plan. A detailed outline of the plan has been produce by the Fisheries Department with technical input from the CRFM experts and it is scheduled that the first draft of the plan will be completed in March 2005 and that the national consultations with stakeholders will be held in April 2005.

Mesoamerican Reef Fund (MAR FUND): The MAR Fund was incorporated as a nonprofit organization in the state of Delaware (USA) in February 2004. The MAR Fund is an emerging environmental fund for the conservation and sustainable development needs of the Mesoamerican Reef Ecoregion shared by Belize, Guatemala, Honduras and Mexico. This new ecoregional financial mechanism is the result of the joint efforts of four environmental funds: Fondo Mexicano para la Conservacion de la Naturaleza (Mexico), Protected Areas Conservation Trust (Belize), Fundacion para la Conservacion de los Recursos Naturales y Ambiente (Guatemala) and Fundacion Biosfera (Honduras). In 2004, the Mar Fund held two Board of Directors (Fisheries Administrator is a director) meeting . These two meeting were geared towards defining the organizational and functional structure of the fund and the elaboration of a strategic plan for the organization's main areas of action over the next five years.

2.6.0 PARTNERS-IN-DEVELOPMENT

Despite major constraints in resources, the Department was able to join forces with its partners in conservation/ development in identifying and accessing grant funds for executing most of its work plan in the Marine Reserves and Capture Fisheries programs.

In 2004, the Department secured $1,314,660 dollars (Annex 1) to facilitate the execution of its work plan for the fiscal year 2004/05.

MONIES MOBILIZED BY FISHERIES DEPARTMENT IN 2004

FOCUS AREAS	PROJECT FUNDS	ORGANIZATION	SOURCE	TARGET AREAS
BACALAR CHICO	$ -			
HOL CHAN	$ 35,000	Hol Chan	PACT	Environ education
CAYE CAULKER	$ -			
GLOVERS REEF	$ 160	WCS	USAID	Co-management
SOUTH WATER CAYE	$ 5,000	Fisheries Dept.	PACT	Construction of SWCMR Station
GLADDEN SPIT & SILK CAYES	$ 830,000	FoN	Oak Foundation, AENA, PACT	Alternative livelihoods, management
PORT HONDURAS	$ 120,000	TIDE	Oak Foundation	Management
SAPODILLA CAYES	$ 214,000	TASTE	UNESCO,PACT,COMPACT, Prodoma	Environ education, infrastructure, Alternative livelihoods
FISHERIES DEPARTMENT	$ 10,000	Fisheries Dept.	CRFM	Formulation of Fish Management Plan
CAPTURE FISHERY PROGRAM	$ 96,000	Fisheries Dept.	PACT	Conch Assessment Project
CAPTURE FISHERY PROGRAM	$ 4,500	Fisheries Dept.	CRFM	Fish Aggregating Devices
TOTAL	**$ 1,314,660**			

3.0 Co-operative & Credit Union Department

During 2004 the Department of Co-operatives was very busy facilitating and concentrating in the following:

- Providing educational programs for co-operatives and credit unions to strengthen their managements/ businesses skills;
- Working effectively in strengthening and implementing the regulatory functions of the department in order to ensure sound financial management at co-operative executive bodies'
- Assisting in the promotion of new commodities and services for co-operatives in the process of diversification and sustainable development;
- Assist co-operative membership by providing effective and efficient technical advice, completing feasibility reports on existing/ new commodities and on services which co-operative members can produce or provide;
- Continuing the process of liquidations for societies that are not producing or providing a service in the last Fifteen Years. There are 88 co-operatives with valuable assets in the list that need to be looked at;

- Hosting of the national co-operative conference held in July 2004 to recognized the most outstanding co-operatives in the country.
- Participating in several trade shows as promotional activities for co-operative commodities and services
- Attending training programs on capacity building to improve the level of technical assistance provided to co-operators by staff.

During the year, the co-operative movement experienced changes in management as a direct result of government restructuring process; in late September the portfolio on Credit Unions was transferred to Central Bank .

Credit Unions: Thrift Co-operatives increased in membership by 5.56 % reaching 87,092 members, and by 6.2% in assets reaching to $292.1 million while savings recorded $222.1 million. The Department of Co-operatives continued to strengthen credit unions' internal control systems by compelling credit unions to use the PEARLS M System, an analysis tool for credit union financials, to ensure prudent financial management in credit union operations.

Staff of the Regulatory Unit of the Department of Co-operatives attended several Anti-Money Laundering Training and other trainings geared towards the effective implementation and enforcement of regulatory functions of the department. The Credit Union Technical Assistance Board Program was very instrumental in the development and implementation of a national credit union marketing plan, reviewed credit union performances and made recommendations for improvement to ensure that credit unions remain competitive with the commercial financial institutions.

Agriculture Co-operatives: Agriculture Cooperatives represent the highest number of registered organizations in the portfolio of the Co-operative Department. During the year the Business and Entrepreneurship Development Unit, worked diligently in assisting several of these co-operatives and pre-co-operatives to ensure that they diversify their current production to other income generating activities. Production of potatoes, general vegetables and onions constituted most of the production in the northern districts. Other commodities under production by co-operatives at the national level are carrots, potatoes, onions, hot peppers, corn, bean, rice, pineapples, organic cocoa and other ground foods.

The livestock co-operatives continued producing milk, although not delivering and processing in an organized manner. Honey production is a commodity that showed drastic decreases due to climatic conditions. The Departments of Agriculture and Co-operatives have provided several training programs to beekeepers to expand and invest in this valuable commodity which enjoys a local market demand, stable prices and limited production

In regards to a feasibility report conducted by CARDI in the Southern Districts, emphasis was placed in looking for suitable varieties for juice processing and for fruit dehydration. Other trainings in management and agronomic practices for several of the commodities grown by co-operative members was, facilitated by the Ministry of Agriculture, through its extension service.

Fishing Co-operatives: consist of approximately 1,900 affiliated members but only 50% of members are active in producing/ selling to the cooperatives. These societies generated more than $23.9 million from marine products. The majority of products are exported to the US and European Markets. Fishing Cooperatives have approximately $25 million in Assets.

Taxi Co-operatives is a new service that people are venturing into. The Department of Co-operatives facilitated 3 societies and three pre-co-operatives with the necessary technical advice in formulating bylaws, keeping their account banks and their internal control systems in order to ensure that these growing organizations serve the general public and remain viable. The need to become organized in the taxi sector is clearly seen in Belize City where the Tourism sector is growing and requires reliable, efficient and safe services.

Housing Co-operatives invested, mainly in the Belize and Corozal districts, in the late 80's and early 90's but are, now, plagued with high delinquency; collections of such investments might not be recoverable in some cases. During the year 2004, the Department of Co-operatives assessed most of these societies and is assessing the possibility of de-registering them.

4.0 PROJECTS & STATUTORY BODIES

4.1.0 Belize Livestock Producers Association

Slaughter Returns: Slaughter figures indicate that in 2004 (13,020) there was a decline in cattle slaughtered locally over figures for 2003 (10,880), especially in the Orange Walk District where there was a drop of 1,028 heads. This down fall was due to several factors such as drought, pasture and alternative markets.

Less pigs were slaughtered in 2004 (14,325) relative to 2003 (19,003); this represents a decrease of 25%. Prices remained stable during most part of the year since farmers had made marketing agreements with processors from the beginning of the year. Prices declined in December for those farmers that had not made marketing agreements with processors since they were not able to market their pigs and some of them were force to sell their stock to foreign markets.

Consumption of sheep also increased in 2004 (1,316) over figures for 2003 (1,137), an increase of 46.73%. More farmers engaged in the production of sheep, which has an attractive market especially in Belize City.

Export: With the opening of the informal Mexican market and the existing Guatemalan market, cattle prices were more attractive than those locally. This created a competition for cattle between the Mexican and Guatemalan buyers. Figures indicate that there was an increase in cattle exported in 2004 (2,804) over those exported in 2003 (1,186), an increase of 372.85%. This is one of the main reasons why there was a decline in cattle slaughtered in the Orange Walk District in 2004. Farmers preferred to market their animals in the export market due to better prices.

Due to overproduction of pigs in the later part of the year, some farmers (Mennonite Communities of Little Belize, Shipyard and Blue Creek) were compelled to sell their pigs in neighbouring export markets.

Imports: Importation of breeding stock continued in 2004. Bulls, mainly of the Nelore and Brahman breeds were imported from the state of Yucatan, Mexico primarily by Mennonite Farmers from the Blue Creek and Spanish Lookout Community.

4.2.0 Belize Agricultural Health Authority (BAHA)

The Belize Agricultural Health Authority (BAHA) was created in order to safeguard the agricultural health of the nation and facilitate trade and commerce. In 2004, our greatest challenge was in the area of finances. The Profit & Loss statement for the reporting period showed a 30% increase in revenue collected as compared to the same period last year. Government subvention accounted for 31% of total revenue, while BAHA generated funds of $1.7 million or 58% of total revenue. Grants accounted for 11% of total revenue.

In 2004, performance of the Authority was constrained by a budget deficit of $243,706. This deficit is 37% less as compared to the same period last year. Such performance was made possible through improvement in the internal operating efficiency. A careful analysis of job functions and work load in relation to existing staff was done before filling vacant posts. At the beginning of the year, BAHA had a total staff count of 109. By July 2004, this number had decreased to 100 and further decreased to 95 by the year's end.

Given that the nature of the work of BAHA is largely technical, training and development plays a key role in maintaining a competitive edge. Throughout 2004, staff participated in short term seminars, workshops and other training to broadened their technical knowledge and sharpen their technical skills. The trainings focused on such areas as SPS measures, trade negotiations, risk analysis, Avian Influenza virus, bee keeping, diagnosis of rabies, treatment of wooden pallets, and identification of pests, among others. Staff also participated in funded meetings and working groups nationally and regionally.

Animal Health: Belize reported three terrestrial animal diseases to the World Organization for Animal Health (OIE) in 2004: West Nile Fever in March, Vesicular Stomatitis in August and Venezuelan Equine Encephalomyelitis in December. All three diseases are zoonotic in nature and all occurred in the Orange Walk District. Besides these three diseases, rabies, another zoonotic disease, was reported in the Cayo District.

Science-based surveillance for Classical Swine Fever and Avian Influenza continued to support our disease free status for these two diseases.

For the first time Belize submitted samples for testing of Bovine Spongiform Encephalopathy (BSE) to Panama. All six samples were negative. Investigation of high mortality in bees in Corozal ruled out any disease and only one case of Varroosis, an endemic disease, was diagnosed in an apiary in Santa Familia, Cayo District.

There has been a small increase in farms visited over 2003. Farm visits increased from 201 to 248 as a result of our response to all calls of disease or clinical signs under surveillance: for example – abortion, sudden death, high mortality and nervous disease.

Due to the requirement of risk analysis for the importation of animal and animal products, a total of nine site visits were conducted in 2004 of which one request was denied approval. Two were for poultry products, four for feed mills, one for a beef processing plant and one for a feeder pig farm. Colombia, Argentina, Guyana and Mexico also requested site visits but the visits were not finalized.

Health certificates were issued for export of pigs to Guatemala, for Circus from Belize to Mexico and for hides to Guatemala. Live animal imports increased during 2004 from 146 to 178. Seven imports were denied either due to disease status in the exporting country or failure to comply with sanitary requirements. Restriction on the importation of beef from USA was lifted and import conditions revised to reflect BSE risk status. There was a 9% decrease in the total number of import permits issued over last year.

Plant Health: The Plant Health Department was faced with new challenges as well as opportunities. One challenge was the introduction of two major pests and one disease namely, the Melon Thrip, ***Thrips palmi***, and Monilia, respectively. Another was the proliferation of some resurgent pests such as whiteflies in soybean and army worm in corn and a localized but significant outbreak of locusts in the Cayo District. ***Gynaicothrips ficorum*** commonly known as the Cuban Laurel Thrips, which affects many species of Ficus, was also recorded for the first time in Belize. Laboratory diagnosis of more than thirty pests was identified from samples of either fruits or vegetables. The plant health officers conducted inspection of imported germplasm to ensure that these commodities for propagation purposes were pest free.

An average of 13 phytosanitary certificates were issued each month for black-eye peas, RK beans, butterfly pupae, palm seeds, cocoa beans, dried herbs and orchids. Pest risk assessment was conducted for a series of plant commodities such as ornamentals, strawberry and grain seeds. In some cases, specific species were denied importation as a risk of being invasive weed specie.

At the same time, it was a very good year for the Medfly programme, since only two sterile male flies were intercepted and no emergency eradication measures had to be taken. A total of 1,353 regular Jackson traps are maintained countrywide, complimented by “Phase 4” traps which are specifically for females and 20 C&C traps that are the most suitable for areas of very low population but considered as the “hot spots” such as Placencia and Toledo. Five medfly technicians who are equipped with 5 vehicles

serviced these traps. For the year 2004, 57,370 traps were serviced representing an inspection rate of 96.5%.

There are three packing facilities presently certified to operate under the medfly programme: one in Cotton Tree Village, Cayo District, the second in Little Belize, Corozal and the third in San Andres, Corozal. For the year 2004, a total of 1.7 million boxes or 52.2 million pounds of papayas were packed and exported. This represents a 59.2% increase in total pounds of papaya exported when compared to the 2003 figures and an increase of 436.3% when compared to the export figures of 2001. The pepper industry continues to struggle due to production and marketing problems. However, it did export 76,064 pounds of pepper for this year with assistance from the Ministry of Agriculture. This is an increase of 26% when compared to production of 2003.

For the year ended 31st December 2004 a total of 419,516 *Anagyrus kamali*, the parasitoid used for the biological control of the Pink Hibiscus Mealy Bug (PHMB) were produced in the regional laboratory. Of this number, 303,445 parasitoids at an approximate value of US$54,620.20 were supplied to Mexico as part of the mandate of the regional laboratory while the remainder was used for local releases and for stinging. This year has been a trying year in the constant production of pumpkin due to climatic factors and the detection of ***Thrips palmi,*** a devastating insect pest that affects mainly cucurbits.

Monthly surveillance was conducted at all the major towns and villages to ensure that the PHMB is kept at an acceptable level of control. San Pedro and Caye Caulker were also surveyed bi-monthly as the pest was detected in those areas. The 29 study sites distributed throughout the country were studied to determine the level of parasitization. The parasitization ranged from 20-96%. Results of the surveillance also showed that 49 new sites were detected throughout the country, however; the parasitoid was found at all the new detection sites. This showed that although the pest is moving, the control agent is moving along with the pest.

Food Safety: The inspection program of the food safety department deployed food safety inspectors that provide regulatory sanitary oversight of Belizean food processing plants (Fish and Fishery products, Meat and Poultry, Milk and Dairy, Fruit and Vegetable Packers, etc). The department took the meat inspection program to another level by developing a "BAHA Label" to be applied to meat retail packages that are placed on the Belizean market through local meat shops and supermarkets. The BAHA label is part of a wider campaign to get the public to recognize and choose those products that have the label affixed to them as a sign of food safety assurance. Preliminary consultation with the supermarket and the general public has shown that the application of the label to food products will be welcomed. BAHA carried out a total of 754 meat and poultry inspections during 2004.

A team comprised of the Bureau of Standards, Public Health Department and BAHA food safety personnel carried out sanitary audits of food processing establishments. Sanitary audits were only conducted on those processing plants that had submitted a complete HACCP plan. Currently there are three shrimp processing facilities in Belize that are HACCP certified by BAHA. Each establishment was assigned an official

number that allows it to export fishery products to favorable markets like the EU. In 2004, BAHA's food safety department conducted a total of 864 inspections. Of this total, 42 inspections were for fishery products, 754 for meat and poultry products, 59 for farm inspections and 5 for sanitary audits.

Some 302 sanitary (22 of which were destined for the EU market) and 154 Veterinary Health certificates were issued by Food Safety Inspectors and Aquatic Animal Health Officers. A total of 70 aquaculture farms, feed mills and hatchery visits were conducted in 2004 and 174 international veterinary certificates were issued which allowed unhindered exportation of farm raised shrimp. A total of 4,464 import permits were issued under the food safety category.

Surveillance testing under the CHARM residue screening program for pesticides, Aflatoxin (B_1) and veterinary drugs (Tetracyclines and Ampenicols) totaled 347 samples, most of which were performed on fish and fishery products (primarily *Panneus* sp.). The microbiology team at Central Investigation Laboratory (CIL) continued to provide competent food testing services for Belize and tested over 1,500 food and water samples for various microbiological parameters. The food microbiology lab continues to be enrolled in proficiency testing through CIL`s enrollment in the **International Network of Food Analytical Laboratories (INFAL)** proficiency testing program. Samples were sent twice for the 2004 program to INFAL's **Canadian Food Inspection Agency (CFIA)** reference laboratory in Canada.

BAHA signed a US$15,000 contract with the **Caribbean Food and Nutrition Institute (CFNI)** for the development and presentation of a promotional campaign on food safety to consumers. A series of food safety training sessions designed to assist local food processors achieve sanitary instruction for their line and farm workers was conducted with finance from the Multilateral Investment Fund (BID/FOMIN) OIRSA project. Instruction covered Belizean food safety regulatory requirements that are based on internationally accepted codes of practices.

Quarantine: Aircraft inspection procedure was implemented on February 2, in accordance with Statutory Instrument #62 of 2001 Section 5(1). The procedure for the disposal of garbage from carriers (sea vessel) arriving in Placencia was developed and instituted with the assistance of the Town Chairman. The quarantine procedural manual was finalized and will be published early next year with funds from the BID/FOMIN OIRSA project.

In an effort to improve the inspection services, collaborative efforts were established with the Customs Department through meetings with the Assistant Comptroller of Customs and Senior Customs Officer. Formal presentations on BAHA's role and functions were made to new Customs Officers during their enrollment.

Other activities conducted by the department included the receipt of 181 import permit applications, the issuance of 1,263 phytosanitary certificates and 6,271 landing permits, the inspection of 2,157 sea vessels, 13,677 aircrafts and 163 markets. A record of 449 violations was made with more than 32,000 pounds of agricultural produce confiscated. Fifty-eight pests were intercepted at the different ports of entry from Central American

countries. They were found primarily on cut flowers, vegetables, fish meal and pine lumber.

IDB Project (Modernization of Agricultural Health Services): The IDB Project 1189/OC-BL final disbursement date was September 28, 2004 by which time a total of US$3,345,544.99 had been disbursed under the project. In 2004 the Authority benefited from the construction of an administrative building, four incinerator houses along with the installation of the incinerators, six training courses, the acquisition and installation of a back up generator for the Central Investigation Laboratory and the development of a public education campaign.

SPS measures: A major accomplishments made in 2004 was Cabinet's official recognition of The Belize Agricultural Health Authority as the Sanitary and Phytosanitary (SPS) Enquiry Point for Belize. In March 2004 two important Committees were formed: the Scientific Steering Committee and the National SPS Committee. Belize, on October 22, 2004, ratified the revised text of the International Plant Protection Convention. Additional accomplishments included benefits derived from two projects under the Food and Agriculture Organization which resulted in the strengthening of the Phytosanitary Capacity of Belize (TCP/RLA/2912) through legislative support in the areas of Pest Free Areas (TCP/RLA/2918) and technical assistance through the BID/FOMIN Project.

Trade concerns that were addressed were not limited to: requests for conditions of importation, requests for inspection of foreign facilities by personnel of the Belize Agricultural Health Authority and notifications from trading partners. Meetings were also held with nationals to sensitize them of SPS measures that could impact trade. A total of forty-one (41) SPS issues were addressed as compared to only twenty-eight in the year 2003.

4.3.0 Belize Marketing & Development Corporation (BMDC)

The BMDC recorded its first operational profit without any financial support from GOB in the 2003/04 financial year. This has been achieved through an increase in the profit margin from 6% to 12% in relation to the previous financial year and by maintaining administrative expenses at 11.5% of sales. Total sales were estimated at $10,867,001. During the reporting period purchases from local farmers and imports were valued at $8,204,537 and $996,356 respectively. This intervention was able to secure a stable market for local producers, assure product availability to consumers and provide support to food processors.

The BMDC has invested more than $22 million in the last three years into the Belizean economy through the purchase of local products. The Corporation has been a catalyst in the growth of the potatoes, onions, carrots and soybean industries, as well as in the increase of the wide variety of locally produced processed products. Marketing arrangements with local rice producers and millers have proven to be beneficial for the sustainable growth of the industry and will receive continued support from the BMDC. Belize has been self sufficient in rice since the last quarter of 2002.

Our efforts are now targeted towards the improvement of the hot pepper industry through product purchase, financial support when possible, consolidating exports through Agro World Co. Ltd. and joint planning with the MAF. Increased emphasis will be placed on ginger, breadfruit, cocoyams, apple bananas, exotic fruit pulps, honey and crafts.

5.0 PARTNER AGENCIES/ PROGRAMS

5.1.0 United States Department of Agriculture (USDA)

The United States Dept. of Agriculture provided a one week workshop on the Identification of fruit flies of Economic Importance, their larvae, Sterile/Fertile, Male/Female Meditaranean Fruit fly ID. The main facilitator for the workshop was Dr. Gary Steck, Entomologist from the Bureau Division of Plant Industry, Florida Department of Agriculture in Gainesville, Florida. Twenty technicians from BAHA, OIRSA, CGA and CPBL, attended the workshop.

In an effort to incorporate Belize into the regional plan of action for medfly, the georeferences for all medfly traps in Belize were collected with the collaboration of medfly technicians. The information was incorporated into the data base of Belize Mexico and Guatemala; with this information the regional office has a gerorefence map with all the medfly traps included. All medfly detections are also incorporated within this map and this helps to give a regional birds eye view of what is transpiring at any given moment in regards to medfly activities within Belize, Mexico and Guatemala.

USDA has always been interested in the epidemiology of all medfly detections in Belize; as a result, a twin engine outboard motorboat was given to BAHA for conducting medfly surveillance and quarantine activities in Belize's Southern waters and Cayes. The boat, a 26 foot vessel, is equipped with GPS, a beacon and dingy for safety purposes. The training package for one technician was also covered by the donation, and this included, the services of an experienced sea captain from Plancencia who travelled for 20 working days with the BAHA technician, showing him the shoals and channels within the reefs. Fuel used for the entire training operation was also provided by the USDA. The construction of a workstation in Big Creek, which will serve as BAHA quarantine and Medfly office is under serious consideration by the USDA for this coming year.

5.2.0 Caribbean Agriculture Research & Development Institute

The CARDI (Belize Unit) Annual Technical Report 2004 covers two cropping seasons, the November/December 2003 planted crop which was harvested in March/April 2004, and the June/July 2004 planted crop and harvested in September/October 2004. Additional crops planted in the November/December 2004 season are not covered in this report since harvesting would commence in March/April 2005. In 2004 the CARDI (Belize) Unit finally succeeded in relocating all its operations to Central Farm. Completion of the move from the Belmopan Field Station was the focus of activities for the year and culminated with the opening of the new office, laboratory and workshop facilities on 12 August 2004.

The cessation of field activities at the Belmopan location in 2003 coupled with, the unsuitability of the allocated field at Central Farm for agronomic trials, resulted in no field trials being established in 2004. The field at Central Farm was however used for seed multiplication and grain production while attempts were made to improve its condition in preparation for the resumption of field trials in 2005.

Open pollinated corn variety ***CARDI YC-001***, eighteen (18) peanut entries and two (2) cover crops were planted in June and were all adversely affected by the drought which was experienced during the June – October crop season. Field activities for the November – March crop season included chickpea, cowpea, mungbean, pigeonpea, sesame, and soybean seed production, and chickpea, cowpea, peanut and soybean preliminary evaluation/germplasm maintenance. Inadequacy of water supply due to the non-functioning of the main irrigation system resulted in the cancellation of seed paddy production at Central Farm for the November – March season.

Hot Pepper: Seeds of four (4) hot pepper cultivars, ***CARDI Red***, ***CARDI Green***, ***West Indies Red*** and ***Scotch Bonnet*** were set in October and seedlings were raised in the screen house for the production of Stock Seed. 'Mother Plants' are being grown in the screen house for the production of fruits from which the seed will be extracted. Seedlings of the four cultivars were also raised for the production of Commercial Seed by selected farmers. Consequent to reports of poor germination due to apparent hardseedness in ***West Indies Red*** seed; a trial was conducted to investigate the effects of various treatments on germination and seedling emergence. Observations showed that eighty percent or more of the seedlings had emerged in all treatments by 14 days after the seeds were planted. The results suggest that the slow and uneven germination and seedling emergence experienced by some Belizean hot pepper producers with seed of the variety ***West Indies Red***, may not have been seed related as there was no significant difference (P=0.05) in average percentage of emerged seedlings or hard seeds among the treatments, implying that the problem may may have been with the adequacy of water around the seeds after they were planted in the germination mix.

Grain Legumes: In 2004 soybean and corn crops planted in May to July were severely infested with caterpillars especially armyworm (***Spodoptera frugiperda***). The infestations were severe due to prolonged dry weather and therefore, poor plant growth was observed for both crops in the Orange Walk District. Normally intensity of rain drops kills the caterpillars. Most of the producers experienced poor control of armyworm by the application of various insecticides. Studies on the comparative bio-efficacy of various insecticides on soybean were conducted against larvae of armyworm (*Spodoptera frugiperda*). Four different insecticides were tested in field conditions at San Carlos, Orange Walk District; All insecticidal treatments were significantly in reducing the larval population of armyworm.

The CARDI (Belize) Unit has also been collaborating with the Belize Bureau of Standards in the production of the **'*Draft*' Regional Standards for the Marketing of Red Kidney Beans**. Laboratory analyses were completed on 21 samples of red kidney

beans, of which 20 were samples taken from shipments that were being exported from Belize. Results of the analyses were presented at a meeting of the Project Management Team that was attended by representatives of the two major red kidney bean exporters.

Seed Production: Nucleus and stock seeds of selected crop types and varieties were produced during November 2003 – March 2004 and June – October 2004 at Central Farm. The crop types were Chickpea, Cowpea, Mungbean, Peanut, Pigeonpea, Sesame, and Soybean. Commercial seeds of corn, cowpea and soybean were produced, cleaned and distributed to farmers.

CARTF: In 2004 four projects funded by the CARIFORUM Agribusiness Research and Training Fund (CARTF) were initiated and completed.

NCCARD: A Launching Meeting of the National Coordinating Committee for Agricultural Research and Development (NCCARD) was organized by the Unit and was held on 10th August 2004. There were 28 participants representing the Ministry of Agriculture, IICA, CARDI, Belize Agricultural Health Authority (BAHA), Citrus Growers Association (CGA), Belize Sugar Industry (BSI), Cane Farmers Association, Belize Marketing and Development Corporation, JANUS Foundation, Pesticide Control Board, Development Finance Corporation, Small Farmers and Business Bank, Republic of China Agricultural Technical Mission (ROC), etc. The Executive Committee of NCCARD was formalized. The Chief Agriculture Officer of the Ministry of Agriculture was elected to act as the Chairman of the Committee. The Members of the Committee are the representatives from the Ministry of Agriculture, IICA, CARDI, ROC, BAHA, CGA, BSI, and the University of Belize.

Technical Assistance: In 2004 efforts continued to be directed at providing technical assistance, on request, to the Extension Service and the Research Division of the Ministry of Agriculture, and to the Belize Marketing Development Corporation (BMDC). The Unit continually provided technical support to other organizations in the agricultural sector including, the Pesticides Control Board (PCB), the Citrus Research and Education Institute (CREI), the Belize Agricultural Health Authority (BAHA), the Faculty of Agriculture and Natural Resources of the University of Belize, the Belize Enterprise for Sustainable Technology (BEST), International Regional Organization for Health in Agriculture (OIRSA), the Inter-American Institute for Cooperation on Agriculture (IICA), the Belize Bureau of Standards and other organizations. Technical assistance was given to the soybean producers in Orange Walk and Cayo districts. Technical support and advisory assistance have also been provided to a large number of individual farmers and farmer groups.

5.3.0 Inter-American Institute for Cooperation on Agriculture (IICA)

The program of the IICA office in Belize was developed in consultation with stakeholders from the public and private sectors and executed in close collaboration with the Ministry of Agriculture & Fisheries. Specific accomplishments and results for 2004 are detailed below and arranged by the inter-thematic programs of the institute prioritized in the 2004 plan of operation.

Environmental Management: Direct technical cooperation was provided to the Toledo Cacao Growers Association (TCGA) in the form of training seminars and field days on farming techniques for nursery and field management in organic cacao production. These activities were conducted to support an expansion program from 200 to 1,500 acres of organic cacao over the next three years. Support was also provided to the Belize Organic Producers Association (BOPA) for preparation of the national organic agriculture legislation. Further support is now being provided to carry this document through the final stages of legal review prior to enactment. Through its involvement in BOPA the Institute is coordinating the promotion of a local system for certification of organic fruits and vegetables to be sold to establishments that cater to the tourism sector.

Food Safety and Agricultural Health: Coordination and logistic support was provided for participation of Belize at the WTO/SPS committee meetings held in Geneva in 2004. A national SPS committee was conformed to support efforts to strengthen national agricultural health services. The Performance Vision Strategy (PVS) Instrument was successfully applied to the livestock/veterinary sector in Belize through a series of consultation with various user groups. The results are being compiled and recommendations will be used to improve the veterinary services in Belize. Through the technical collaboration of CATIE and IICA, monilia (frosty pod) of cacao was positively identified in Belize. Further technical support was provided to conduct a national survey and preparation of an action plan for its eradication. The relevant authorities continued to realize benefits from the information supplied through the ACCESS electronic bulletin.

Institutional Modernization: Technical support was provided through participation on the National Committee for Coordination of Agricultural Research and Development (NCCARD). This was a newly established committee, which will be setting up commodity sub-committees that will define priorities for research and development at the national level. A national workshop on strategic planning and curriculum development was coordinated and facilitated for the Department of Agriculture of the Faculty of Science & Engineering of the University of Belize, in order to support the University efforts at strengthening of agricultural education in Belize.

Developing Human Capital: Technical support was provided through the participation of two Ministry of Agriculture Statisticians at the first and second Central American Region Workshop on Agricultural Statistics held in Honduras and El Salvador respectively. The Agricultural Innovation (Red SICTA) Project was officially launched in Belize during the month of November. Belize was also represented at the second international forum on Agri-business of tropical fruits, held in El Salvador.

Strengthening Rural Communities: Technical support was provided to the cashew producers' cooperative on processing of cashew nuts and management of their processing facility. This cooperative is in its first year of operation; the processing equipment was imported from El Salvador through technical assistance provided by IICA.

Facilitating Competitiveness and Global Trade: A seminar "Opportunities and Challenges for the Development of Small and Medium-Size Rural Eco-enterprises in a Global World" was hosted by IICA and facilitated by a technician from CATIE. Through the collaboration of IICA, CATIE, TCGA, and MAF a seminar (Current and prospective

status of Organic Cacao: The case of Belize) was conducted to support the expansion program of organic cacao in Belize.

Other Technical Programs: Technical staff from the office participated in numerous committees and working groups for commodities/topics such as citrus, sugar, tropical fruits, organic agriculture, bio-safety and ecological agriculture, making valuable technical inputs towards the overall improvement in Belize's agriculture.

Finally, the office had a display booth, showcasing IICA and the technical cooperation programs executed in Belize, at the annual national agriculture and trade fair in Belmopan held on May 14-16, 2004. In connection with this event, technical assistance was also provided for the process of selection of the "Farmers of the Year 2004" which is the highest level of recognition bestowed upon the best performing farmer for the year 2003/2004.

5.4.0 Food & Agriculture Organization – 2004

The Ministry of Agriculture had identified the following nine thematic areas for FAO's intervention for 2004: School gardens, sustainable fisheries, food enterprise development, forestry, extension services, post-harvest technology, impact of agricultural trade liberalization, bee-keeping and waste management. With the exception of extension services, all these areas were addressed either through Technical Cooperation Projects (TCP), Telefood projects, direct information sharing and by facilitation of workshop attendance for WTO trade related issues especially Sanitary and Phyto-sanitary Measures. Additionally, in 2004 the ministry specifically requested FAO's expertise in developing the ministry's operational strategy for policy implementation. FAO responded swiftly with a Technical Cooperation Project "Management and operational framework strategy for the implementation of national agricultural policies" which was executed in the latter part of the year. There was also major emphasis on the implementation of the vertical component of the regional "Promoting CARICOM/ CARIFORUM Food Security" project. This project focused on establishing irrigated vegetable, root crop and rice production plots in five target districts for training and technology transfer in improved productivity and post-harvest methods at the community level. The project aims to address issues of marketing, farmer organization, record keeping and nutrition awareness, as critical elements for achieving the overall food security objectives.

FAO's programme of assistance for Belize during 2004 further included five regional TCP's on marketing, small ruminant production, forest health and management, strengthening of phytosanitary capabilities and establishment of medfly free areas. Four Telefood projects were implemented, two pertaining to the establishment of school gardens, one in grain drying/storage and one in sustainable vegetable production. Five more Telefood projects were submitted during 2004 and by year's end approval was received for a school garden project in Stann Creek and a bee-keeping demonstration at FANR. Three other proposals on pineapple seed propagation, onion storage and Youth Hostel agricultural expansion await approval.

World Food Day was celebrated at the Elton Gillett Memorial Park in Burrell Boom village under the global theme "Biodiversity for Food Security" on October 15th. Activities for the occasion included speeches, cultural presentations, booth displays of primary/processed foods, agricultural support services and a live nutritional forum which accentuated the theme and the event's significance. FAO facilitated the launching of the vision/mission/objectives of The National Food & Nutrition Security Commission which is expected to play an increasingly important role in World Food Day celebrations.

5.5.0 Republic of China on Taiwan (Technical Mission)

The Taiwan Mission was dispatched in early 1991 to work with the Government and people of Belize in agricultural development. In addition to nine local employees, there are fifteen members from Taiwan, including the Chief, two agronomists, two horticulturists, one food processing specialist, one mechanic, three assistants, and five volunteers. In addition to volunteer program and credit scheme, the Mission is currently undertaking three agricultural programs, namely, the Rice Program, the Horticultural Program, and the Food Processing program in Belize.

I. <u>The Rice Program</u> is aiming to produce quality rice seeds, to transfer seed multiplication technology, and to assist in improving production systems of rice. The major achievements during 2004 are as following:

1. Sales (acreages planted) of quality rice seeds:
   a. 'CARDI 70' : 45,400 pounds (385 acres).
   b. 'Jasmine 85' : 43,000 pounds (430 acres).
   c. 'Taichung Sen 10' : 3600 pounds (60 acres).
2. Trials of new varieties:
   Two trials of 22 new varieties have been carried out in Pappy Show, Toledo. Six varieties were evaluated. Their agronomic characteristics are shown in the following table; trial line 3 has shown positive results.

<u>Agronomic Characteristics of Promising Rice Varieties</u>

Lines	Yield (lbs)/ Acre	Results
3	**5,344**	**Positive/ Promising**
92	5,077	
167	4,943	
168	4,943	
181	4,943	

3. Testing of production and marketing potential of Jasmine 85' variety has been carried out at Central Farm, Cayo and in Pappy Show, Toledo. A farmer in Blue Creek, Orange Walk harvested 430 acres of Jasmine 85' variety. Tests on new aromatic rice varieties will continue.
4. Technical assistance in rice production totaled 445 acres(60 acres of Taichunshen 10; 385 acres of Cardi 70)in Toledo.

5. Training of students from FANR, Tumul Kin and other schools as part of the Rice Program continued.
6. Facilitated the establishment of the National Rice Committee in the MOA. The committee coordinates the production, marketing and policy for the rice industry in the country. It is aiming to draft a national plan for rice development.
7. Through the National Committee, the Mission secured seeds of Cardi 70 from CARDI, and also procured seeds of Sepress from the USA. These seeds will improve the genetic uniformity of rice seeds.

II. <u>The Vegetables, Fruits and other Agronomic Crops Program</u> aims to achieve diversification/productivity in fruits/vegetables.. The program help to identify promising crops or new varieties, to develop farming and marketing practices, to transfer technology to interested farmers, and to assist in organizing farmer groups. The major achievements during 2004 are as following:

1. Propagation of planting material of promising crops:
   a. Soybean: 2,600 pounds.
   b. Vegetable soybean: 330 pounds.
   c. Soybean (for sprouts): 570 pounds.
   d. Azukibean: 1,200 pounds.
   e. Peanut: 1,300 pounds.
   f. Mungbean: 165 pounds.
   g. Cherry tomato (seeds): 0.88 pounds.
   h. Guava: 500 plants.
   i. Carambola: 48 plants.
   j. Wax apple: 24 plants.
   k. Jujube: 3 plants.
2. Production of crops for processing:
   a. Dasheen: 5,500 pounds.
   b. Sweet potato: 4,400 pounds.
   c. Carambola: 1,000 pounds.
3. Demonstration of vegetables in Central Farm, including Cabbage, Cauliflower, Broccoli, Chinese cabbage, Cucumber, Chive, Radish, Carrot, lettuce, Eggplant, Onion, Sweet pepper, Hot pepper, Tomato, Snow pea, Snap bean, Balsam pear, Sponge gourd, Bottle gourd, Chinese leek, Water convolvulus, Water melon, Melon, and Mung bean.
4. Promotion of new variety of mask melon. Technical assistance to 'Production and Marketing Team' in vegetables (including Cherry tomato, Sweet pepper, Tomato, Cabbage, Cauliflower, Water melon, Cantaloupe, and wax gourd production).
5. Training of students from FANR and '4H' on vegetable production.
6. Sponsoring construction of five onion storage facilities in Orange Walk, Corozal, and Belize Districts as a pioneer project.
7. Four field days were organized for some 120 farmers to introduce a mixed farming system, that combine annual and perennial crops at various production stages. The farming system helped to maintain a constant and continuous income flows for the farmers.
8. Helped five schools in building school gardens.

9. The Mission organized two training courses on post harvesting of vegetables for farmers from Corozal, Orange Walk, and Cayo Districts.
10. More than 80 farmers benefited from the Small Farm-holders' Financing Scheme" at BEST; and the performance of loans have gradually improved. It is noted that greater effort is needed at having improvement in thee loans being handled by BMDC.

III. <u>The Food Processing Program</u> involves a food processing laboratory to introduce new techniques for value-adding to local agricultural produces. The major achievements during 2004 are as following:

1. Based on past experiences and careful evaluations, the Program has selected a few product lines that will be given higher attention. As a result, the food processing lab has been re-organized with frying, drying and pulping machinery.
2. The Program developed promising processed products from materials available in Belize, including dehydrated pineapple, and wax gourd; vacuum fried peanut, dasheen, plantain and banana, bee products, fried corn, potato chips, sweet potato chips, dasheen chips, and hot pepper powder. Waste shrimp heads has been used to make food power.
3. Training of farmers from Toledo on production of dried pineapple and papaya.
4. Carried out 6 training sessions for 124 participants and accommodated some 230 visitors to the laboratory.
5. Carried out training sessions for 35 bee farmers on legal requirement for forming a cooperative.
6. A feasibility study was carried out to evaluate a new drying facility in the Corozal district.

5.6.0 International Regional Organization for Agriculture Health (OIRSA)

The year 2004 was a challenging one for the **International Regional Organization for Agricultural Health** (OIRSA) due to the fact that new pests were discovered in our country like the *Thrips palmi*, *Monilia rureri*, patches of locust and Venezuelan Equine Encephalomyelitis (VEE), while rabies outbreak in horses were experienced. OIRSA is committed in assisting with the agricultural health of the region; OIRSA funded the emergency control program for VEE with a financial contribution of US$10,900.00, and also covered the expenses incurred for shipping of rabies samples to Panama, as well as, the diagnostic for the samples.

The pink hibiscus mealybug is still a threat for Central American countries and Belize has the biological lab for rearing the *Anagyrus kamali*, a parasitoid by nature that keeps the population of mealybugs under control. This lab is manage by technicians from BAHA and financed by OIRSA with US$101,000.00 for 2004; thus producing 419,516 wasps of which 303,445 were shipped to Mexico for their biological control program, the remainder was used for stinging in the lab and releasing in the fields country wide.

Another challenge for OIRSA was the construction of its administrative building at the Showground in Belmopan with the donation of the land by the Ministry of Agriculture and Fisheries, and the acquisition of a loan from our headquarters. Our quarantine treatments facilities at the four mayor points of entry managed to conduct quarantine treatments in the amount of: Airport- 4,396; Benque Viejo- 17,546; Corozal Border- 13,812; Port of Belize Ltd.- 10,561 for a total of 46,315 including containers and luggage compartments of airplanes and all other types of vehicles that crossed the border.

OIRSA thru OSPESCA is managing the PREPAC project for Fisheries in conducting an inventory of fresh waters bodies in the country for a possibility of developing micro projects for fish rearing with financial assistance from the Republic of China, Taiwan. The PREFIP II project is still ongoing with financial assistance from the Taiwanese government and for 2004 Belize received US$26,483.00 to continue the surveillance activities for maintaining a Classical Swine Fever Free status for Belize.

The IDB/MIF –OIRSA (BID/FOMIN-OIRSA) project managed to work in areas that enhances the strengthening of phytosanitary measures for fostering international agricultural trade, and Belize benefited by conducting a series of training in different areas identified by the Belize Agricultural Health Authority along with the Ministry of Agriculture and Fisheries. Training was provided for compliance with International Standard for Phytosanitary Measure (ISPM) No. 15 of 2002 that deals with "Guidelines for Regulating Wood Packaging Materials in International Trade". These guideline places a huge responsibility on the Agricultural Health Authority for monitoring the compliance of this standard and making exporters comply with it. A Seminar on a proposal for the establishment of an organizational model for the national food safety system in Belize was conducted; sanitary and Phytosanitary Measure were analyzed with the objective of reviewing the legislation in each country and elaborating and presenting a harmonized legislation for the OIRSA region. A series of seminar/ Training on Food Safety in the area of Good Agricultural Practices, Good Manufacturing Practices, Good Veterinary Practices and HACCP was conducted for personnel of the Ministry of Agriculture, BAHA and the private sector (Honey Bee Producers, Papaya Industry; Hot Pepper Industry; Hot Pepper producers, Citrus Products Ltd., other industries like Poultry, Cattle, cheese, Jam, Jellies, Restaurants).

6.0. Senior Management Staff of the Ministry

(31st December 2003)

Ministry:

Hon. Servulo Baeza, Minister of Agriculture & Fisheries
Hon. Ismael Cal , Minister of State
Hugh O'Brien, Chief Executive Officer
Mrs. Cordilia Avila, Finance Officer
Mr. Jose Castellanos, Policy Analyst
Micael Tewes, Director of Citrus & Bananas
Mr. Albino Vargas, Director of Sugar

Departments:

Eugene Waight, Chief Agriculture Officer
Ms. Beverly Wade, Fisheries Administrator
Ms. Zenaida Moya, Registrar of Cooperatives & Credit Unions

Statutory Bodies:

Mr. Carlos Moreno, General Manger, Belize Marketing & Development Corporation
Ms. Neri Sanz, Managing Director, Belize Agriculture Health Authority
Mr. Jose Novelo, Managing Director, Community-Initiated Agriculture & Rural Development
Orlando Habet, Chairman, Belize Livestock Producers Association
Virginia Vasquez, Acting Managing Director, Coastal Zone Management Authority

Assoicated Regional/ International Organizations:

Mr. Anil Sinha, Representative, CARDI
Dr. Edwin Martinez, Acting Representative, IICA
Juen-Yi Chen, Chief of Technical Mission, ROC Taiwan
Mrs. Emelda Lizarraga, Representative, OIRSA
Mr. Crispin Blanco, Representative, USDA/APHIS

Appendix I: Comparative Primary Agriculture Output Value for 2003 and 2004 at Producer's Price

Economic Value of Agriculture Output 2004						
Commodities	**Quantity (lbs.) 2003**	**Quantity (lbs.) 2004**	**Price** (BZ$) 2003**	**Price* (BZ$) 2004**	**Value (BZ$) 2003**	**Value (BZ$) 2004**
Sugarcane	**1,073,247**	**1,149,475**	**$ 41.53**	**$ 46.07**	**$ 44,571,947.91**	**$ 52,956,313.25**
Bananas:						
(40 lb boxes)	3,137,223	3,195,298				
(28 lb boxes)	388,449	387,516				
(36 lb boxes)		127,813				
(40 lb boxes)		7,668				
(37 lb boxes)		44,615				
(33 lb boxes)	466,707	387,712				
(26 lbs boxes)	221,268	330,352				
(31 lbs boxes)	110,272	136,685				
(28 lbs other)	27,440	96,736				
(28 lbs other 2nd class)		53,203				
Banana Products (lbs)	**161,706,543**	**175,040,286**			**$ 52,579,212.00**	**$ 52,991,271.00**
Apple Banana (Bunches)(30 lbs/bunch)	20,840	73,988	$ 3.00	$ 3.00	62,520	221,964
Domestic Consump (40 lbs/Box)	202,133	218,800	$ 3.00	$ 3.00	606,400	656,401
Banana Products					**$ 53,248,131.54**	**$ 53,869,636.07**
Citrus:						
Grapefruit **(80lb box)**	1,078,137	1,478,788	$ 4.58	$ 3.84	$ 4,937,867.46	$ 5,678,545.92
Orange **(90 lb box)**	4,046,295	4,946,717	$ 5.90	$ 5.03	$ 23,873,140.50	$ 24,881,986.51
Fresh Lime Export (lbs)	274,725	158,400	$ 0.06	$ 0.06	$ 16,483.50	$ 9,504.00
Fresh Orange Export (lbs)	10,271,528	15,082,519	$ 0.15	$ 0.15	$ 1,540,729.20	$ 2,262,377.85
Fresh Grapefruit Export (lbs)	227,294	227,294	$ 0.25	$ 0.25	$ 56,823.50	$ 56,823.50
Domestic Lime Consumpt. (lbs)	437,500	120,000	$ 0.50	$ 0.50	$ 218,750.00	$ 60,000.00
Domestic Grapefruit Consumpt. (80 lbs/bx)	10,781	63,089	$ 6.00	$ 6.00	$ 64,686.00	$ 378,534.00
Domestic Orange Consumpt. (90 lbs/bx)	202,315	279,873	$ 8.00	$ 8.00	$ 1,618,520.00	$ 2,238,984.00
Citrus Products					**$ 32,327,000.16**	**$ 35,566,755.78**
Marine Products (incl 5% for dom. Consump)					**$ 116,132,962.58**	**$112,740,525.45**
Lobster	564,792	537,947	$ 24.07	$ 28.15	$ 13,593,211.00	$ 15,142,367.00
Conch	435,240	596,093	$ 9.51	$ 9.75	$ 4,137,651.00	$ 5,810,205.00
Shrimp	16,105,812	16,998,908	$ 5.76	$ 5.01	$ 92,846,034.00	$ 85,153,247.00
Whole Fish	50	2,220	$ 8.07		$ 403.50	$ 3,350.00
Fish Fillet	55	258,825	$ 7.35		$ 404.00	$ 1,224,911.00
Other	1,400	2,760	$ 17.94	$ 13.71	$ 25,118.00	$ 37,849.00
Domestic Consumption	855,367	919,838			$ 5,530,141.08	$ 5,368,596.45

Other						
Papayas (export)	31,200,010	60,989,421	$ 0.45	$ 0.41	$ 14,040,004.50	$ 25,005,662.61
Cowpeas	6,902,400	5,951,000	$ 0.45	$ 0.45	$ 3,106,080.00	$ 2,677,950.00
Hot peppers (export)	328,454	76,152	$ 0.80	$ 0.80	$ 262,763.20	$ 60,921.60
Hot peppers (local)	251,385	331,528	$ 1.00	$ 1.27	$ 251,385.00	$ 421,040.56
Cocoa	91,200	87,369	$ 2.00	$ 2.00	$ 182,400.00	$ 174,738.00
RK beans	9,667,940	6,629,920	$ 0.75	$ 0.79	$ 7,250,955.00	$ 5,237,636.80
Black Beans	2,581,640	2,179,656	$ 0.80	$ 0.79	$ 2,065,312.00	$ 1,721,928.24
Other Beans	684,300	149,000	$ 0.80	$ 0.80	$ 547,440.00	$ 119,200.00
Corn	78,474,112	67,306,275	$ 0.20	$ 0.20	$ 15,694,822.40	$ 13,461,255.00
Rice paddy	28,113,893	23,537,939	$ 0.22	$ 0.22	$ 6,185,056.46	$ 5,178,346.58
Sorghum	20,180,400	17,954,000	$ 0.14	$ 0.14	$ 2,825,256.00	$ 2,513,560.00
Soybean	3,515,808	700,000	$ 0.34	$ 0.34	$ 1,195,374.72	$ 238,000.00
Cabbage	2,469,900	3,786,800	$ 0.75	$ 0.59	$ 1,852,425.00	$ 2,234,212.00
Cucumber	546,838	221,707	$ 0.50	$ 0.50	$ 273,419.00	$ 110,853.50
Okra	239,070	111,645	$ 0.65	$ 0.65	$ 155,395.50	$ 72,569.25
Squash	202,701	128,300	$ 0.45	$ 0.45	$ 91,215.45	$ 57,735.00
Pumpkin	493,700	350,965	$ 0.40	$ 0.40	$ 197,480.00	$ 140,386.00
Sweet Pepper	930,284	695,553	$ 2.50	$ 2.12	$ 2,325,710.00	$ 1,474,572.36
Tomatoes	2,766,660	1,301,617	$ 1.00	$ 1.40	$ 2,766,660.00	$ 1,822,263.80
Irish Potato	1,055,050	1,599,700	$ 0.65	$ 0.69	$ 685,782.50	$ 1,103,793.00
Onion	1,798,065	1,304,010	$ 0.60	$ 0.74	$ 1,078,839.00	$ 964,967.40
Carrots	502,886	569,200	$ 0.60	$ 0.67	$ 301,731.60	$ 381,364.00
Cassava	2,706,130	2,624,350	$ 0.50	$ 0.39	$ 1,353,065.00	$ 1,023,496.50
String Beans	20,350	13,000	$ 0.80	$ 0.80	$ 16,280.00	$ 10,400.00
Lettuce	37,438	31,037	$ 0.75	$ 0.75	$ 28,078.50	$ 23,277.75
Chinese Cabbages	308,350	118,800	$ 0.80	$ 0.80	$ 246,680.00	$ 95,040.00
Broccoli	16,950	51,560	$ 1.50	$ 1.50	$ 25,425.00	$ 77,340.00
Celery	6,500	55,400	$ 2.00	$ 2.00	$ 13,000.00	$ 110,800.00
Cho-cho	158,892	108,310	$ 0.75	$ 0.75	$ 119,169.00	$ 81,232.50
Sweet Corn (ears)	285,800	30,000	$ 0.70	$ 0.70	$ 200,060.00	$ 21,000.00
Cauliflower	6,000	10,175	$ 1.50	$ 1.50	$ 9,000.00	$ 15,262.50
Cocoyam	1,034,737	581,160	$ 0.50	$ 0.58	$ 517,368.50	$ 337,072.80
Sweet Potato	399,800	216,800	$ 0.40	$ 0.43	$ 159,920.00	$ 93,224.00
Yam	81,650	56,500	$ 0.40	$ 0.46	$ 32,660.00	$ 25,990.00
Yampi	101,000	101,400	$ 0.40	$ 0.46	$ 40,400.00	$ 46,644.00
Jicama	68,200	51,500	$ 0.50	$ 0.50	$ 34,100.00	$ 25,750.00
Mangoes	2,651,000	1,240,500	$ 0.50	$ 0.50	$ 1,325,500.00	$ 620,250.00
Local Papaya	624,000	120,000	$ 0.53	$ 0.42	$ 330,720.00	$ 50,400.00
Peanuts	181,400	169,380	$ 1.11	$ 1.07	$ 201,354.00	$ 181,236.60
Pineapple	3,655,287	4,759,880	$ 0.35	$ 0.55	$ 1,279,350.45	$ 2,617,934.00
Pitahaya	16,400	0	$ 2.00	$ 2.00	$ 32,800.00	$ -
Plantain (bunches)*	611,420	813,135	$ 5.00	$ 5.00	$ 3,057,100.00	$ 4,065,675.00
Watermelon	3,793,026	3,355,365	$ 0.30	$ 0.30	$ 1,137,907.80	$ 1,006,609.50
Coconuts (Nuts)	3,075,843	2,055,500	$ 0.50	$ 0.51	$ 1,537,921.50	$ 1,048,305.00

Cotton	60,125	0	$ 8.00	$ 8.00	$ 481,000.00	$ -
Canteloupe	564,700	434,440	$ 0.40	$ 0.40	$ 225,880.00	$ 173,776.00
Annato	41,300	30,800	$ 0.90	$ 0.90	$ 37,170.00	$ 27,720.00
Coffee	502,800	510,000	$ 1.35	$ 1.35	$ 678,780.00	$ 688,500.00
Avocado	396,400	225,750	$ 0.75	$ 0.75	$ 297,300.00	$ 169,312.50
Cashew (raw nut)	240,800	316,250	$ 1.00	$ 1.00	$ 240,800.00	$ 316,250.00
Ginger	138,000	185,100	$ 0.75	$ 0.75	$ 103,500.00	$ 138,825.00
Nutmeg	500	50,000	$ 15.00	$ 15.00	$ 7,500.00	$ 750,000.00
Grapes	3,500	0	$ 3.50	$ 3.50	$ 12,250.00	$ -
Craboo	175,000	166,750	$ 0.75	$ 0.75	$ 131,250.00	$ 125,062.50
Guava	127,400	0	$ 1.50	$ 1.50	$ 191,100.00	$ -
Other Fruit (sapodilla,mamey,etc.)					$ 137,500.00	$ 137,500.00
Other Vegetables (radish, cilantro, etc.)					$ 110,000.00	$ 110,000.00
Soursop	22,025	24,575	$ 2.00	$ 2.00	$ 44,050.00	$ 49,150.00
Fruits/Vegetables					**$ 77,731,447.08**	**$ 79,435,991.85**
Livestock:						
Dressweight:						
Beef	4,361,850	5,859,000	$ 2.50	$ 2.25	$ 10,904,625.00	$ 13,182,750.00
Beef Export (on the hoof) (lbs)	1,126,700	2,663,800	$ 1.10	$ 1.10	$ 1,239,370.00	$ 2,930,180.00
Pigs	2,412,240	1,719,000	$ 3.00	$ 3.25	$ 7,236,720.00	$ 5,586,750.00
Sheep	42,900	49,350	$ 3.00	$ 3.00	$ 128,700.00	$ 148,050.00
Poultry	30,048,504	30,740,883	$ 1.54	$ 1.60	$ 46,274,696.16	$ 49,185,412.80
Turkey	353,511	317,449	$ 3.00	$ 3.00	$ 1,060,533.00	$ 952,347.00
Milk (lbs)	7,584,352	7,974,867	$ 0.32	$ 0.32	$ 2,426,992.64	$ 2,551,957.44
Spent hens (No. Heads)	139,000	139,000	$ 3.00	$ 3.00	$ 417,000.00	$ 417,000.00
Eggs (Dozen)	2,664,928	2,851,257	$ 1.50	$ 1.50	$ 3,997,392.00	$ 4,276,885.50
Honey (lbs)	117,343	83,466	$ 4.50	$ 4.50	$ 528,043.50	$ 375,597.00
Livestock					**$ 74,214,072.30**	**$ 79,606,929.74**
All Non-traditional products					**$ 151,945,519.38**	**$ 159,042,921.59**
Citrus/Sugarcane/						
Bananas/Fisheries					**$ 246,280,042.18**	**$ 255,133,230.55**
Total Agri. Output					**$ 398,225,561.56**	**$ 414,176,152.14**

**** 1 Bunch = 45 lbs***

Source: MAFC, District Agriculture Ofices Reports

Appendix II-A: Nominal Food & Agriculture Export ('000 Bz $)

Commodities [a]	2000	2001	2002	2003	2004
Sugarcane Sector:					
Sugar	$ 74,232	$ 59,370	$ 65,981	$ 71,227	$ 81,534
Molasses	$ 268	$ 1,649	$ 2,678	$ 2,476	$ 1,766
Sugar/Molasses	*$ 74,500*	*$ 61,019*	*$ 68,659*	*$ 73,703*	*$ 83,300*
Bananas	*$ 65,821*	*$ 42,804*	$ 33,499	$ 52,579	$ 52,991
Citrus Sector:					
Orange Concentrate	$ 95,254	$ 68,853	$ 53,493	$ 65,538	$ 55,489
Orange Squash	$ 19,786	$ 4,653	$ 3,094	$ 1,479	$ 2,222
Orange Oil	$ 240	$ 385	$ 809	$ 566	$ 2,093
Oranges	$ 1,886	$ 760	$ 2,439	$ 2,406	$ 2,112
Grapefruit Concentrate	$ 13,412	$ 15,700	$ 13,950	$ 12,516	$ 23,817
Grapefruit Squash	$ 8,088	$ 1,946	$ 7,080	381	$ 1,792
Grapefruit Oil	$ 231	$ 102	$ 306	$ 24	$ 1,573
Citrus	*$ 138,897*	*$ 92,399*	*$ 81,171*	*$ 82,909*	*$ 89,097*
Marine Products:	$ 71,679 [b]	$ 66,566	$ 70,363	$ 110,157	$ 107,372
Lobster	$ 18,765	$ 12,973	$ 13,236	$ 13,598	$ 15,142
Conch	$ 4,858	$ 4,647	$ 3,440	$ 3,741	$ 5,810
Shrimp	$ 47,831	$ 48,933	$ 53,563	$ 92,762	$ 85,153
Whole Fish	$ 145	$ 12	$ 124	$ 30	$ 3
Fish Fillet	$ 16	$ 0	$ -	$ -	$ 1,225
Crab	$ 64	$ 1	$ -	$ 26	$ 38
Traditional Sector	*$ 350,896*	*$ 262,789*	*$ 253,692*	*$ 319,348*	*$ 332,760*
Other:					
Pepper Sauce	$ 666	$ 397	$ 414	$ 607	$ 1,122
Papayas	$ 11,454	$ 10,260	$ 15,508	$ 16,752	$ 22,818
Red Kidney Beans	$ 2,427	$ 3,247	$ 2,059	$ 1,659	$ 2,138
Black Eye Peas	$ 3,001	$ 2,875	$ 2,457	$ 3,410	$ 2,015
Mangoes	$ 31	$ 0	$ -	$ 1	$ -
Cocoa Beans	$ -	$ -	$ 29	$ 94	$ 69
Honey	$ -	$ -	$ -	$ -	$ -
Peanuts	$ -	$ -			$ 12
Chicle		$ 15	$ 63	$ 22	$ -
Total Other	$ 17,579	$ 16,793	$ 20,530	$ 22,545	$ 28,173
Agriculture Export Earnings	$ 368,475	$ 279,582	$ 274,222	$ 341,893	$ 360,933

[b] Marine Product values for 2000 and 2001 are from Fisheries Department, Belize City

Appendix II-B: Real Food & Agriculture Exports ('000)

Commodities [a]	2000	2001	2002	2003	2004P
Sugarcane Sector:					
Sugar (Long Ton)	108	94	103	99	112
Molasses (gals)	5,147	4,809	5,618	5,610	5,037
Sugar Products					
Bananas (tonne)	64	50	42	73	79
Citrus Sector:					
Orange Concentrate (gal)	5,450	4,901	3,621	4,921	6,095
Orange Squash (gal)	4,003	761	950	418	582
Orange Oil (lbs)	601	366	508	244	1,273
Oranges (lbs)	5,541	5,893	15,627	13,636	15,083
Grapefruit Concentrate (gal)	885	805	730	768	1,710
Grapefruit Squash (gal)	1,113	334	1,519	107	347
Grapefruit Oil (lbs)	103	58	58	11	182
Marine Products (lbs)	6,351	8,267	7,332	17,063	18,397
Lobster	673	468	499	536	538
Conch	526	644	465	450	596
Shrimp	5,061	7,145	6,330	16,052	16,999
Whole Fish	74	10	38	24	2
Fish Fillet	13	0	-	-	259
Crab	4	0	-	1	3
Other					
Pepper Sauce (lbs)	363	196	285	399	651
Papayas (lbs)	11,454	13,786	24,465	36,522	55,607
Red Kidney Beans (lbs)	3,665	5,944	3,940	3,118	3,647
Black Eye Peas (lbs)	9,171	7,419	5,913	8,130	4,466
Mangoes (lbs)	138	0	0	10	-
Cocoa Beans (lbs)	65	66	55	45	45
Chicle (lbs)	0	0	27	19	-
Honey (lbs)	N/A	N/A	N/A	N/A	-
Peanuts (lbs)	N/A	N/A	N/A	N/A	21

Source: [a] All export commodities figures are from Central Statistics Office

N/A = Not Available

Appendix III: Food & Agriculture Imports ('000)

Appendix III: **Agriculture Imports 2000 – 2004**

(Using bze$, 1$us=2$bze)

Imports	2000	2001	2002	2003	2004
Meat;#	$ 10,266	8,911	$ 8,323	$ 9,524	$ 9,120
Beef	$ 257	104	$ 101	$ 168	$ 126
Pork	$ 357	1,544	$ 1,599	$ 2,199	$ 3,502
Poultry	$ 113	156	$ 98	$ 397	$ 329
Other	$ 9,539	7,107	$ 6,526	$ 6,760	$ 5,163
Dairy	$ 21,187	23,148	$ 22,594	$ 23,053	$ 23,567
Eggs	$ 1,134	1,144	$ 1,030	$ 1,195	$ 895
Rice	$ 258	1,368	$ 821	$ 297	$ 136
Flour	$ 703	865	$ 696	$ 216	$ 210
Other cereals*	$ 15,064	15,434	$ 9,716	$ 18,595	$ 18,870
Fruits and veget.	$ 11,082	11,955	$ 11,236	$ 11,168	$ 12,353
Rk.beans	$ 12	101	$ 339	$ 498	$ 45
Other food*	$ 31,048	$ 36,964	$ 36,552	$ 32,147	$ 26,398
		12%	-9%	10%	-8%
Total food	$ 106,266	118,765	$ 107,840	$ 118,730	$ 109,232
Inputs:					
Seeds	$ 1,306	1,636	$ 1,561	$ 1,336	$ 1,273
Fertilizers	$ 8,064	6,109	$ 11,311	$ 9,423	$ 8,435
Herbicides	$ 3,497	3,286	$ 4,306	$ 3,903	$ 4,171
Insecticides	$ 4,400	3,852	$ 4,711	$ 4,829	$ 3,890
Fungicides	$ 1,541	1,713	$ 2,745	$ 3,043	$ 3,454
Animal feed	$ 14,206	17,240	$ 14,971	$ 20,702	$ 16,366
		2%	15%	8%	-15%
Total inputs	$ 33,014	$ 33,836	$ 39,605	$ 43,236	$ 37,588
		7%	-2%	6%	-8%
Total ag. Imports	$ 123,768	$ 133,725	$ 130,912	$ 139,928	$ 129,182
Other imports	$ 924,803	$ 899,925	$ 918,117	$ 964,246	$ 899,035
Total imports	$ 1,048,571	$ 1,033,650	$ 1,049,030	$ 1,104,174	$ 1,028,217

Includes fresh, chilled, preserved & processed products

* Includes processed and unprocessed products

Source: Belize Central Statistical Office