

# MINISTRY OF AGRICULTURE & FISHERIES



## ACRONYMS

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

<b>GMO</b>	Genetically Modified Organism
<b>GMP</b>	Good Manufacturing Practices
<b>GOB</b>	Government of Belize
<b>HACCP</b>	Hazard Analysis and Critical Control Point
<b>HIVOS</b>	Humanist Institute for Co-operation with Developing Countries
<b>ICCAT</b>	International Commission for the Conservation of Atlantic Tunas
<b>IDB</b>	Inter-American Development Bank
<b>IFAD</b>	International Fund for Agricultural Development
<b>IICA</b>	Inter-American Institute for Cooperation on Agriculture
<b>IMMARBE</b>	International Merchant Marine Registry of Belize
<b>INFAL</b>	International Network of Food Analytical Laboratories
<b>MAF</b>	Ministry of Agriculture and Fisheries
<b>MBRS</b>	Meso-American Barrier Reef System
<b>MOU</b>	Memorandum of Understanding
<b>NARI</b>	National Agriculture Research Institute
<b>NEMO</b>	National Emergency Management Organization
<b>NGO</b>	Non Governmental Organization
<b>OIRSA</b>	International Regional Organization for Health in Agriculture
<b>OSPESCA</b>	Central American Organization of the Fisheries and Aquaculture Sector
<b>PAHO</b>	Pan American Health Organization
<b>PHMB</b>	Pink Hibiscus Mealy Bug
<b>RFS</b>	Rural Financial Services
<b>RK</b>	Red Kidney
<b>ROC</b>	Republic of China (Taiwan)
<b>RUTA</b>	Regional Unit for Technical Assistance
<b>SAQS</b>	Strengthening Agriculture Quarantine System
<b>SCPC</b>	Sugar Cane Production Committee
<b>SCQCA</b>	Sugar Cane Quality Control Authority
<b>SICA</b>	Central American Integration System
<b>SIRDI</b>	Sugar Industry Research and Development Institute
<b>SMP</b>	Synoptic Monitoring Program
<b>SPAGS</b>	Spawning Aggregation Sites
<b>SPFS</b>	Special Project for Food Security
<b>SPS</b>	Sanitary/Phyto-sanitary
<b>TCGA</b>	Toledo Cocoa Growers Association
<b>TCP</b>	Technical Cooperation Programme
<b>TNC</b>	The Nature Conservancy
<b>UNDP</b>	United Nations Development Programme
<b>USA</b>	United States of America
<b>USDA</b>	United States Department of Agriculture
<b>UTN</b>	National Technical Unit for RUTA
<b>VDRU</b>	Veterinary Drug Registration Unit
<b>WNV</b>	West Nile Virus
<b>WTO</b>	World Trade Organization
<b>WWF</b>	World Wildlife Fund

<p style="text-align: center;"><b>MINISTRY OF AGRICULTURE &amp; FISHERIES (MAF)</b></p>	<p style="text-align: center;">ANNUAL REPORT 2003</p>
<p style="text-align: center;"><b>OUR CLIENTS and PARTNERS IN DEVELOPMENT</b></p>	<p style="text-align: center;">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</p>

<b>THEME</b>	Agriculture and Fisheries: Pillar of the Belizean Economy
<b>VISION</b>	A transformed/modern sector that is fully competitive, diversified and sustainable.
<b>MISSION</b>	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.
<b>STRATEGIC OBJECTIVES</b>	<ol style="list-style-type: none"> <li>1. Increase the efficiency, profitability and competitiveness of the agriculture, fisheries and cooperative sectors</li> <li>2. Accelerate the diversification in production, processing and exports</li> <li>3. Improve and conserve the natural and productive resource base to ensure long-term sustainable productivity and viability</li> <li>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</li> <li>5. Strengthen the institutional capacities to provide effective support in marketing and trade, research and extension, as well as relevant education and training</li> </ol>

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## Foreword



This is my first annual report as the Minister responsible for agriculture and fisheries, and I would like to take this opportunity to thank, congratulate and recognize the achievement of the farmers, fishers and producers of Belize who have made my work very pleasant. The success of our development programs would not have been possible without the dedication and hard work of these productive Belizeans, working hand in hand with the staff of the Ministry and our partners in development. Our achievements in 2003 have contributed to improving the quality of life for all Belizeans by providing the opportunity for our people to lead creative and productive lives, thereby fulfilling an important manifesto commitment.

Last year, we presented to you some very impressive figures which demonstrated that our agriculture sector continues on the path of growth. The figures this year are no less impressive – there were slight reductions in the production of some commodities but for the most part, the production of crop, livestock and farmed marine products are still on the rise. The agriculture and fisheries sector continues on the road of expansion, generating foreign exchange and employment opportunities, and boosting the Belizean economy.

It is my belief that an economy can only grow if it is built on an agricultural foundation that provides the raw materials for processing, manufacturing, tourism and other sectors to grow and make maximum contribution to the economy. In addition, a country can only claim that it has truly grown if the rural sector grows, and the economy of the rural sector is based primarily on agriculture. It is also common knowledge that the development of agriculture and the rural sector is the best weapon to use in the fight against poverty and hence this sector is at the forefront in the development plans of our Government.

Every time we eat a plate of food, fry a fish, bite into a fruit or drink a glass of juice, we must reflect on where the product came from. Our farmers and fishers produce the energy and building blocks for our bodies and generate the foreign exchange to facilitate our imports. This is enough to ensure that we give agriculture the respect it deserves and consider it a noble and needed profession. Thank you.

A handwritten signature in black ink, appearing to read 'Servulo Baeza'.

Hon. Servulo Baeza  
Minister of Agriculture and Fisheries

## **Acknowledgement**

This document is a result of team work by staff of the departments of Agriculture, Fisheries and Cooperatives, working together with the units of information, trade/policy, citrus/bananas, sugar, as well as the Belize Livestock Producers Association, the Coastal Zone Management Authority and Institute, the Community-Initiated Agriculture & Rural Development Project, the Belize Marketing & Development Corporation, the United States Department of Agriculture, the Regional Unit for Technical Assistance, the Caribbean Agriculture & Research Development Institute, the Inter-American Institute for Cooperation on Agriculture, the Food & Agriculture Organization, the Republic of China on Taiwan Agriculture Technical Mission, the International Regional Organization for Health in Agriculture and the Belize Agricultural Health Authority. To the staff of these departments, units, sections, projects, programs and partner agencies which took time in preparing respective executive reports and assisted the trade/policy unit in compiling and finalizing the report **MANY THANKS; YOU** have made possible the publication of the **ACCOMPLISHMENTS** of the **AGRICULTURE, FISHERIES AND COOPERATIVE SUBSECTORS in 2003.**

## Executive Summary

Nominal agriculture income expanded by 17 % from \$340 million in 2002 to \$400 million in 2003 with the major sources of growth being bananas and farmed shrimp. The growth in bananas and farmed shrimp was also largely responsible for an expansion in agricultural exports from \$280.9 million in 2002 to \$344.8 million in 2003, adding \$ 64 million in foreign currency to the Belizean economy. Of greater significance is the fact that the agriculture and fisheries sector would have recorded an increase in export earnings of some \$120 million in 2003 were it not for the drastic reduction that occurred in the world market price for farmed shrimp and papaya.

The sugar sector experienced an improvement relative to 2002 due largely to a 6.5% price increase; export price per long ton of sugar was \$683. Sugar exports expanded from 103,000 to 108,000 long tons while molasses exports remained relatively stable resulting in \$76.2 million in export earnings (11.1% increase); increased export earnings allowed cane farmers to receive \$44.6 million in payments which represented an increase of 2.0%.

The banana sector continued to recover from Hurricane Iris and to prepare for the tariff only regime of the EU scheduled for January 1, 2006. Traditional banana exports to the European Union expanded to 75,000 metric tonnes which represented an increase of 74%, while export earnings reached only \$53.7 million due to low prices since by-and-large the RENT on the EU licensing regime went to the marketing company of Fyffes and not the farmers in Belize. Price received per metric tonne of exported banana was \$701 which represented a decrease of 26%.

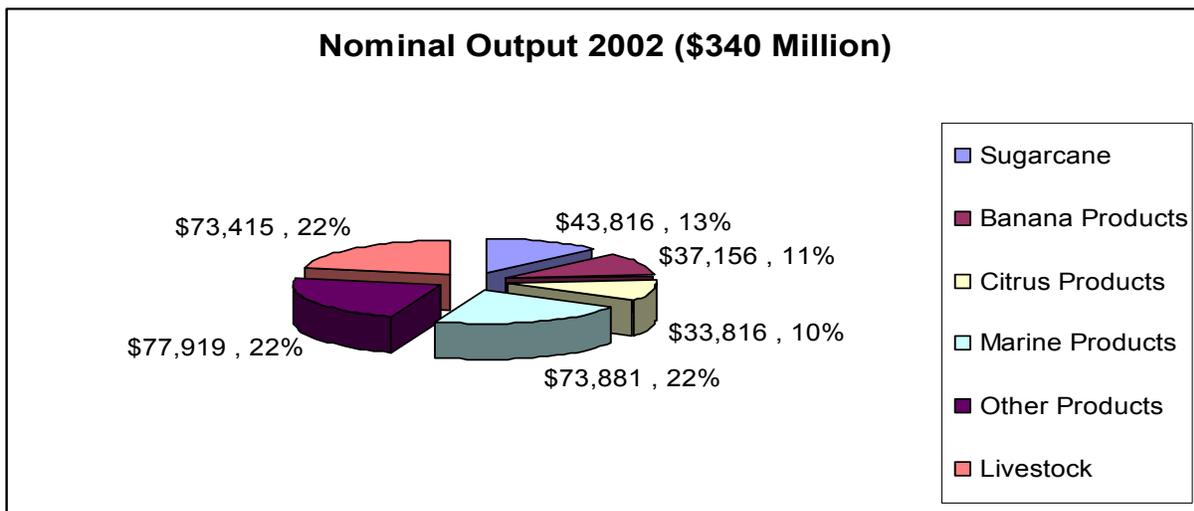
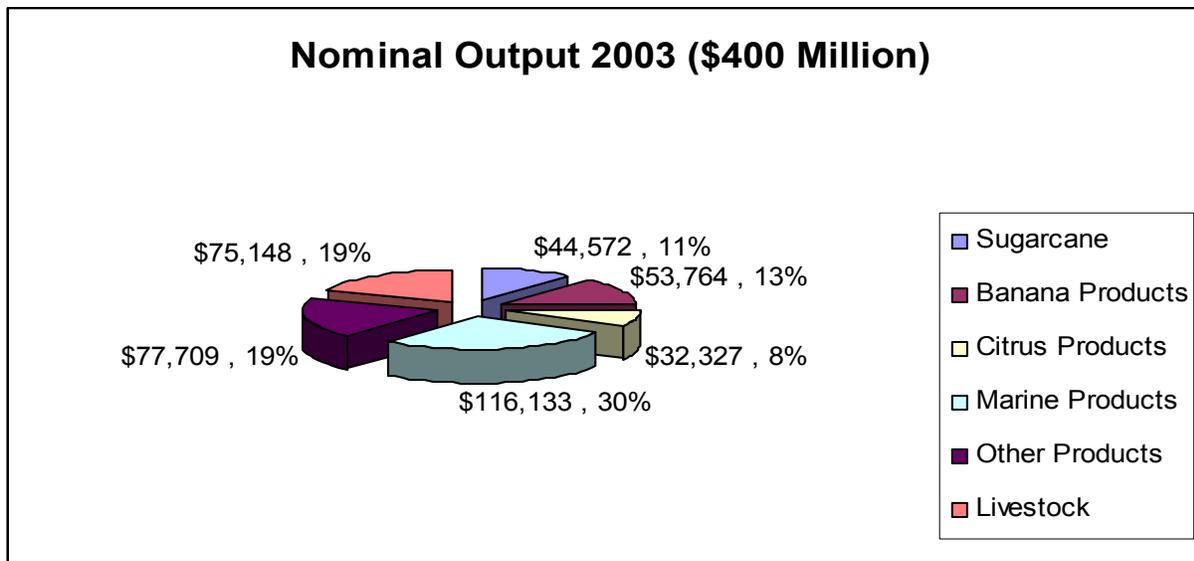
In the citrus sector export earnings increased to \$83.0 million which represented an increase of 3.7%. The main contributor to increased export earnings was the increased exports of orange concentrate which expanded by 30 % to 5,274,000 gallons; this translated into export earnings of \$66.2 million from orange concentrate or a 32% increase. All the other categories (orange squash, orange oil, grapefruit concentrate, grapefruit squash, and grapefruit oil) of citrus exports showed a decline. The categories with the steepest relative/absolute reductions were orange squash with 45% in real terms, and grapefruit squash with 80% in real terms; together the reduced squash exports represented more than \$11 million in lost export earnings.

Non-traditional exports exhibited mixed results but on average showed a growth of 7% reaching \$22.3 million. Main sources of growth were cocoa beans, hot pepper sauce, papayas and black-eye peas. The main factor for the small increase in non-traditional exports was the sharp 28% decline in prices received for papaya exports since papaya constituted roughly 75% of all non-traditional exports.

Aggregate fisheries exports expanded significantly by more than 57 % to \$110.6 million; this made history by converting the fisheries sector to the most important export earner for Belize; secondly, it also catapulted the aquaculture industry (farmed shrimp) to the single most important agriculture industry in terms of export earnings. Shrimp represented 84% of all fisheries export earnings; lobster represented 12.2% and conch contributed the remaining balance of 3.5%. The record earning in the shrimp industry was achieved in a very unfriendly external market environment where prices of farmed shrimp tails decreased from \$8.27/lb to \$4.12/lb on average; expansion of

shrimp output from 6.2 million lbs of tails to 22.3 million lbs of tails (260% increase) compensated for lower average prices.

The year 2003 was a good year for Cooperatives & Credit Unions. Credit Union performance indicated that assets increased by \$43 million to \$280 million, savings increased by \$37 million to \$215 million and membership increased by 7,000 to 82,000 members. The fishing cooperatives recorded total membership of more than 1,300, membership shares valued at more than \$3 million, fixed assets at more than \$8 million and capital at more than \$9 million. Livestock Cooperatives were also active as they continued in their production of cattle, chickens, honey, honey pollen, pigs, and royal jelly. Taxi and Transport Cooperatives were also making their impact on the local and the tourism sector. Societies were strengthened, and in some instances, amalgamated to make further positive impacts in their areas of operations.



Overall, 2003 was a good year for agriculture, fisheries and cooperatives; the figures clearly demonstrate that agriculture is indeed one of the twin pillars of the economy of Belize.

## **1. AGRICULTURE DEPARTMENT**

### **1.1.0 Traditional Crops**

#### **1.1.1 Citrus**

The citrus industry continued to expand its operations with the acquisition of the processing facilities by the Citrus Growers Association. Production continued to improve although the price for citrus products was low and improvement was slow. Nevertheless the industry continued to expand with plans which included diversification of products. The industry saw value-added and diversification as important aspects in order to ensure the continued growth of the industry. In this regard they were looking at blending of juices with pineapple and other fruits as well as improved packaging and presentation of products on the local and export market. The citrus industry was considered competitive in the region but needed to keep a close eye on Brazil and the USA with regards to markets and opportunities for marketing citrus products. On the home front, CREI continued to monitor the disease status of orchards and nurseries in order to stay on the forefront of technology in order to keep the industry competitive. Improvements were also recorded at the processing plant with new equipment and techniques being implemented to improve receipt and processing of fruit. Progress continued in updating the Citrus Industry Act.

#### **1.1.2 Bananas**

In 2003, the industry was expected to produce/export 4,200,000 boxes or 77,000 tonnes of bananas. While a preferential market existed for bananas, those preferences have eroded due to the private marketing arrangements which have directly affected prices received for Belize's bananas. The industry's target was for 5,400,000 boxes or 100,000 tonnes to allow for economies of scale in production and marketing/shipping. Growers continued to focus and prepare themselves for January 1<sup>st</sup>, 2006 when the New Banana Regime is expected to be implemented. The focus was on reduction of costs and improvement in yields while maintaining high quality of fruit. Because of high quality requirements, about 15% to 20% of the crop was rejected from the export trade. The rejected fruits were considered for value-added through the drying of bananas for the export market. GOB continued to be closely involved and supportive to the industry through lobbying in Europe, provision of improved roads (which helps to keep quality high), and marketing efforts. The EU Banana Support Programme continued to be instrumental through improved drainage, irrigation, new planting materials, disease control, cold storage, and new effort at marketing. The industry continued to pursue the establishment of a marketing presence in Europe and to seek new markets for bananas through the employment of a consultant by the BGA and the GOB.

#### **1.1.3 Sugar**

With the increased challenges developing at the local and international levels, particularly with regards to trade liberalization and policy adjustment measures exerting considerable pressure on the preferential markets for sugar, the Ministry of Agriculture directed the sugar sector to accelerate the reform process at the local level.

**Sugar Cane Production Committee (SCPC):** Under the new Act this Committee was charged with "implementing a de-regulated system of cane production." In essence this Committee was responsible for implementing a system which balanced the demand of sugar cane at the factory and



the supply of cane in the field. The most practical way of doing this was to set up a delivery system based on actual cane production as opposed to the cane licensing system that had been implemented since the inception of the industry. In a system of delivery by cane license, a grower was only able to deliver his allocated license or “quota;” any excess production above his quota was to be sold to another license holder with little or no production, or the grower was to wait if an opportunity presented itself for him to deliver his excess production as “extras”. Under

the new “de-regulated” system a grower was allowed to deliver all his sugar cane in his own name or license, regardless if production was above his “quota” allocation; this move was allowing genuine cane farmers to expand to their level of production capacity thereby increasing efficiency in the use of resources.

**Sugar Cane Quality Control Authority (SCQCA):** This Committee was activated in 2003 in view of the dire need to improve sugar quality in order for the industry to comply with international sugar standards and remain competitive. One of the main responsibilities of this Committee was to implement a cane payment system based on quality which rewarded those farmers delivering better quality cane and also served as an incentive to those with inferior quality canes. As part of this objective a trip was organized in which 55 cane farmers and other industry officials visited a sugar factory in Guatemala already implementing such a system of payment. It was expected that this committee will submit its recommendations to the Sugar Industry Control Board shortly for further action.



*Field trip*

## 1.2.0 Crop Development

### 1.2.1 Cashew

Progress continued with the cashew development project aimed at empowering local communities of rural Belize district to establish cashew production, processing and marketing as a viable enterprise. The completed cashew processing plant was inaugurated early in the year, and by mid-year the equipment for



*Cashew processing plant in Sand Hill, Belize District*

processing cashew nuts had been procured and installed. A cashew production survey carried out in the Belize district indicated a production potential of 770,000 lbs crude nuts. Training in cooperative management continued with assistance from the cooperative department plus there was additional training for cooperative members and technicians in cultivation practices, germplasm selection and global marketing conducted by an Australian cashew specialist. The specialist was contracted through a CDE funded project through the Ministry of Industry; a germplasm bank was established in Belize with a private farmer for the selection of plants with superior agronomic characteristics; this was essential in order to boost the productivity of an expanding cashew industry.

### **1.2.2 Hot Pepper**

Hot pepper exports increased to 328,454 lbs (75,241 lbs more than in 2002); 66% was sold as processed product by Marie Sharp's. Fresh pepper exports through AgroWorld decreased primarily due to continuing problems with timely payments to producers. A total sale of 251,385 was recorded in the domestic market. This brings the overall fresh pepper production figure to 579,839 lbs which includes sales for the export and domestic markets as well as product unsold due to lack of markets at the time of harvest. Yields continued to be exceptional averaging 16,000 lbs to 20,000 lbs per acre with a one acre surveillance plot that obtained a record yield of 28,000 lbs of exportable produce. A new executive committee was elected, substituting dormant producers with active pepper growers. A mechanism for the collection of cess payments from pepper exported was put in place so as to assist producers to offset problems resulting from late payments or natural field production losses. Late in the year a new production plan was launched by the association's membership with the aim being to satisfy an export market of 20,000 lbs of fresh pepper on a weekly basis.

### **1.2.3 Coconuts**

The coconut hybridization project continued to prove its economic sustainability with an average cross-pollination efficiency of 2.5 nuts per bunch; the program came fully under management of the Central Farm Research Station at the end of the 2002. A total of 9,245 lethal yellowing resistant seedlings were sold of which 5,847 or 63 % were Maypan.

### **1.2.4 Onions**

Onion production reached an all time high of 1.80 million lbs with unprecedented high average yields of 20,000 lbs per acre in the major producing district. In some cases, yields of up to 35,000 lbs per acre were obtained. This over production combined with lack of adequate storage facilities resulted in losses at the farmer level amounting to 8.2%. The statistics showed, however, that despite some losses most farmers recorded significant profit from this crop. A proposal for the construction of five pilot onion storage units in the Corozal, Orange Walk and Belize districts was submitted to, and approved for funding by, the ROC agricultural technical mission.

### **1.2.5 Carrot production**

The 2003 carrot crop marked the third year of the Department's carrot production promotion program; production was projected to be 400,000 lbs. However, due to high yields, 2003 production reached 502,886 lbs, setting a new record for carrot production in Belize. The distribution of production was as follows: Cayo - 427,336 lbs, Orange Walk - 30,550 lbs, Corozal - 15,000 lbs, Belize - 30,000 lbs. The main varieties planted were Royal Cross, Brasilia, Carson and Bangor.

### **1.2.6 Potato production**

The potato production target for 2003 was 2.5 million lbs. However, the actual production recorded was 1,055,050 lbs, distributed as follows: Cayo - 889,050 lbs; Corozal - 76,000 lbs; Orange Walk - 90,000 lbs. The main varieties planted were Red LaRouge and Atlantic. Due to poor seed quality, the Cayo district planted only 148.28 acres although seed was initially distributed for 182.2 acres.



*Potato field in Orange Walk District*

### 1.2.7 Broccoli, Celery, Cauliflower

Broccoli, celery and cauliflower production increased with more farmers becoming involved in production. Farmers in five districts (Toledo excluded) produced broccoli over a four month period and by the end of the year successfully adopted broccoli as part of their production systems using varieties recommended through the crop research programme. Celery production was concentrated in the Cayo district where exceptional yields of over 21,000 lbs/acre and high quality product were obtained with varieties selected through the research programme.

### 1.2.8 Garlic

A small demonstration plot of elephant garlic established at Central Farm appeared promising. Three other varieties along with elephant garlic was procured for on-farm research in Orange Walk but was not established in time due to delays in land preparation.

### 1.2.9 Beans

During the first six months, exports of RK beans to the Caribbean region, especially Jamaica, were very slow and, therefore, the Ministry led a delegation of producers and exporters to Jamaica. Meetings were held with a number of importers in Jamaica as well as with officials from the Ministries of Agriculture and Trade. In the latter half of the year, exports picked up significantly and by the end of the year over 3 million lbs of RK and small red beans had been exported; however, there was still a carryover of over 1 million lbs of RK beans from the 2002 beans crop.

### 1.2.10 Soybeans

A combined production of 3.5 million lbs (3,525,545) was harvested in 2003 from the October 2002 and June 2003 crops, which yielded 220,970 lbs and 3,304,575 lbs respectively. Ninety four percent of this production was obtained from the June 2003 crop. Since the start of the project, the June crop has been the most successful crop despite the fact that it is at higher risk due to potential heavy rains during harvest in the months of October and November. A total of 329.3 acres were planted in October 2002 and harvested in 2003 resulting in an average yield of 671 lbs per acre; a total of 10 farmers actively participated in the October 2002 crop.



*Soy bean field in Orange Walk District*

In June 2003 a total of 2,122 acres were planted of which 1,898 acres were harvested recording an average yield of 1741 lbs per acre. A total of 31 farmers participated in the June 2003 crop and several farmers obtained yields of over 2000 lbs per acre with the highest yield being 2464 lbs per acre. There was a 15 % increase in productivity compared to the June 2002 crop and a 46% increase in productivity compared to the June 2001 crop. The June 2003 crop was bought by three companies namely Reimer's Feed Mill (1,200,835lbs), Abraham Wall (1,046,239lbs) and Bel-ProMills (965,897 lbs) for a total of 3,212,971lbs of beans delivered. The remaining production was used to pay individuals for services rendered such as drying. The total value of the soybeans was over one million dollars. The average cost of production was \$400 per acre with the maximum and minimum being \$527 and \$300 per acre respectively.

The Soybean Industrial Complex which included the Drying and Storage unit and the Processing and Oil Refinery Unit is nearing completion. Four storage silos and two holding bins were erected and the dryer installed. The civil work for the processing building was completed and the installation of the equipment for the processing and oil refinery was delayed. Negotiations for the transfer of the plant to the private sector are ongoing pending the complete installation of the plant. After three years of operations it is expected that the project will be phased out beginning in 2004, and that only the technical support program will remain active.

## SOYBEAN CROPS

Crop Season	Prod (Lbs)	Acres Plant	Acres Harvest	Yield (Lbs)	Productivity increase (%) relative to 2001 And 2002	# of Farmers
June 2001	532,365	445	445	1,196		5
June 2002	1,649,294	1758	1088	1,516	27	25
June 2003	3,304,575	2451	1898	1,741	46 / 15	31
Oct 2001	384,720	2018	1300	296		
Oct 2002	408,931	329.3	329.3	671	127	15
Oct 2003	Feb.2004 (plan harvest)	480	480	440		2

### 1.2.11 Organic Rice

The 2003 crop of organic rice was expected to be some 200,000 lbs, however, at delivery, a few farmers ended up using herbicides and others mixed up their crop with the conventional crop and lost the opportunity to be certified as organic. In the end, only 23 farmers qualified and together they delivered 109,000 lbs of certified organic rice.

### 1.2.12 Pineapple

In early June, the agriculture department facilitated a meeting with the pineapple farmers in the Stann Creek district and the Citrus Products of Belize Ltd. It was agreed that the factory would process pineapples into concentrate for use as squash and for export. The price agreed was \$ 0.17 per pound for Smooth Cayenne pineapples and \$ 0.15 per pound for all other varieties, including sugar loaf. At the end of the crop 598,000 lbs of pineapple had been delivered to the factory.

### 1.2.13 Soursop

Impressive results were obtained from rehabilitated soursop orchards in the Belize and Toledo districts where improved management practices including pruning and bagging were demonstrated. A fifty percent bagging success rate was achieved yielding four to five pound fruits per tree on a monthly basis. Toledo farmers also experienced some success with air-layering work as 20 out of 28 trees air-layered gave good results.

### 1.2.14 Grape



Materials were purchased for the irrigation of the grape demonstration plot in Santa Martha, Orange Walk. Management practices such as pruning, fertilizing, mulching, foliar and insecticide sprays as needed were carried out by the farmer. Of the 150 grape plants (Kyobo variety) purchased, 100

plants were used to enlarge this plot to a total of 165 plants. Twenty plants were given to another interested farmer in Douglas village. After this initial expenditure the demonstration plot was used to provide planting material for further expansion and for sale to other farmers.

### **1.2.15 Pitahaya**

The 300-plant demonstration plot in Waterhole, Cayo district continued to progress satisfactorily. Some of the plants started to flower. As with the grape demonstration, this plot provided planting material for further expansion in the Cayo district. The Corozal district expressed interest in the promotion of pitahaya.

### **1.2.16 Other Fruit Trees and Crops**

Over 3,500 fruit trees were sold, mostly from the fruit tree nursery at Agstat Stann Creek. The fruit tree programme focused on grafting techniques for some of the thirty-seven species regularly propagated at Agstat. Success was achieved with sixteen species including mamey which had been particularly problematic; sales of grafted species accounted for about 25% of total sales. Grafting of breadfruit unto breadnut rootstock remained a challenge.

Demonstrations for specific commodity improvement were also carried out and included cocoyam, fertilizer studies in the Belize district, pineapple varieties for induction studies at St. Margaret, cabbage varieties for dry season production in Belize and Cayo, expansion of cho cho demonstration plots in Orange Walk and Curare plantain rehabilitation in Belize.

### **1.2.17 Apple Banana**

There was moderate expansion of apple banana on small plots throughout the districts whilst eyes focused on the thirty acres in Sarteneja and Little Belize, the only commercial establishments. Commercial scale production started in July with the harvest of 1,072 bunches from 20 acres. Yields then decreased to a plateau of 25 bunches (500 lbs) per acre monthly. Export tests were initiated but hampered due to the high cost of freight, lack of liquidity by the exporter, and decreased quality of produce. The two demonstration plots in Orange Walk consistently produced high yields of 1,500 lbs per acre monthly, which indicated the potential for this commodity under good management. However production costs especially with respect to irrigation will determine the feasibility of this initiative in the northern districts compared to the central and southern districts where agro-climatic conditions are more suitable.

### **1.2.18 Okra**

Okra production for export was initiated in the Stann Creek district in response to a market opportunity presented by a local exporter. Four shipments (total of 230 boxes) were made after which export was discontinued with the realization that there was not sufficient quantity at any one time to make exportation viable. Due to the excellent product quality achieved toward the end of the season and the interest displayed by some of the better farmers and the exporter, the agriculture station established a best practice demonstration plot later in the year to determine the viability of okra production for export in the Stann Creek district. The demonstration plot proved highly successful with average yields of 20 boxes of marketable produce per harvest, four times that achieved by farmers in commercial production earlier in the year. However, the export market was not confirmed in time for the winter season production in 2003.

### 1.2.19 CARTF

Three projects were approved by the Cariforum Agriculture Research & Training Fund for a total of \$69,311 US. These were essentially feasibility studies for developing dehydrated pineapple products for the local and export markets, production and marketing of cassava based livestock feeds, and marketing/operation management for the cashew producers' cooperative.

### 1.2.20 Telefood

A telefood project for the “development of sustainable vegetable production systems” was approved by FAO and activities commenced with the selection of six participant farmers in the Stann Creek, Cayo and Belize districts. Family drip systems were set up and one task plots of sweet pepper, tomato, cabbage or broccoli production was initiated in each of six locations. By the end of the year participating farmers had commenced harvesting of three first cycle sweet pepper plots in the Stann Creek and Cayo districts.

### 1.2.21 Food Security and Nutrition

Preparations were made for the launching of the vertical component of the Food and Nutrition Security Project in early January 2004. The vertical component in Belize was funded to the tune of \$204,000 US and focused on irrigated production of rice, root crops and vegetables in selected areas of the country identified as vulnerable to food insecurity.

### 1.3.0 Livestock Development

The livestock industry continued to grow, increasing in value from \$73.4 million in 2002 to \$74.5 million in 2003. The poultry sub-sector was the biggest contributor although it experienced a 5% decline in production. The number of cattle, pig and sheep slaughtered increased in 2003, and honey production expanded from 104,500 lbs to 117,343 lbs. Cottage cheese production was significantly higher as the demand for this commodity continued to rise, especially in the Hispanic communities. In the area of animal health no disease of quarantine importance was experienced by the national herds. Considerable progress was also made with the formation and functioning of the different livestock councils, namely the poultry, dairy, pig and beekeeping councils, which were operational and had active stakeholder participation.

In dairy, there was an increase in overall milk production but the Cayo district had its share of problems due to severe mastitis. An attempt was made to obtain and report milk production and processing for those districts, such as Stann Creek, Belize, Corozal and Toledo, that were not reporting this information in the past but which do produce considerable amount of milk for home use and for processing into cheese.

#### NATIONAL LIVESTOCK HERD PER DISTRICT

Specie	Belize	Cayo	Corozal	O/Walk	St. Creek	Toledo	Total (2003)	2002
Beef	4,275	15,437	1,236	29,990	1,636	1,676	54,250	53,389
Dairy	142	1,079	964	1,171	52	142	3,550	3,560
Pig	1,290	1755	965	6,536	892	9,786	21,224	22,820
Sheep	245	1464	1,822	1,921	578	235	6,265	6,409
Goat	10	40	NA	15	20	56	141	NA

### 1.3.1 Poultry Production

The poultry industry continued to lead the livestock sub-sector in output/value. However production fell slightly from 30.8 million lbs in 2002 to 30 million lbs in 2003, a decrease of 2% while egg production increased by 24%.



#### POULTRY AND EGG PRODUCTION PER DISTRICT

Item	Belize	Cayo	Corozal	O/Walk	Toledo	Total 2003 (lbs)	2002 (lbs)
<b>Poultry (lbs)</b>	90,000	14,836,618	1,981,626	13,117,884	21,800	30,048,504	30,800,751
<b>Eggs (doz)</b>	90,000	1,557,612	301,745	701,071	14,500	2,664,928	2,153,322

Approximately 58% of total production was from Quality Poultry, 20% from Caribbean Chicken and the rest from other smaller processors.

Quality Poultry was the only company that marketed turkeys in 2003; they processed 46,780 birds as compared to 32,371 in 2002, an increase of 31% as compared to 2002. Belize has come a long way from not producing turkeys to becoming self-sufficient in whole turkeys. This was facilitated through the storage of a portion of their stock for sale throughout the year.

In July there was an egg shortage for two weeks. This was attributed to excess heat, a high percentage of young birds and higher consumption as a result of high tourist arrivals. Producers from the northern districts are now using the Black sex-linked breed of layers. This breed dresses out better when it is slaughtered, they produce for longer periods than other breeds and the color of the eggs remains consistent for a longer period in any one cycle.

### 1.3.2 Dairy

Milk production increased by 13% in 2003. This increase was partly due to improvement in pasture management and feeding regimes by some producers. Western Dairies processed 4.11 million pounds while Big-H processed 239,765 lbs. Deliveries to Western Dairies increased by 4 %, and would have increased further if it were not for the severe cases of mastitis that occurred during part of the year. This problem was more prevalent in the dry season when cows were more stressed due to reduced feed availability and greater susceptibility to disease pathogens. Consequently several producers opted to process their milk into cheese and others sold the milk to middlemen that did the processing.

#### COMPARATIVE MILK BY-PRODUCTS BY DISTRICT (LBS.)

Item	Belize	Cayo	Corozal	O/Walk	St. Creek	Toledo (2003)	Total
Cream	NA	NA	3,423	NA	NA	8,755	12,178
Cheese	22,785	147,000	6,000	NA	29,328	11,845	216,958

The dairy section at Central Farm produced 169,200 pounds of milk from an average of 19 cows, up by 9% over that of 2002 which was 148,170 pounds. This increase was a result of a 10.7 %

increase in average milk production per cow from 23.3 pounds in 2002 to 25.8 pounds in 2003. Productivity was higher due to the improvement of pastures, increased number of sub-divisions and the use of protein sources as green-chop. Eight of the dairy cows were synchronized and bred with the objective of having them bred around the same time. This practice also helped improve calving interval.

**COMPARATIVE MILK PRODUCTION BY DISTRICT (Lbs.)**

Year	Belize	Cayo	Corozal	O/Walk	St. Creek	Toledo	Total (2003)
2003	91,140	5,498,208	715,204	760,000	216,050	303,750	7,584,352

The economic value of locally processed milk products was in excess of \$ 8 million and the bulk of these value-added products was cheese. Processing and sale of cheese at one processing plant increased from 84,349 lbs in 2002 to 146,121 lbs in 2003.

**1.3.3 Beef Production**

The beef industry like most other livestock activities continued to enjoy higher farm-gate prices.



Exports to Guatemala which totaled 1,186 head (in comparison to 1,702 heads in 2002) contributed to the stabilization of farm gate prices as farmers were able to sell excess stock. Farm gate prices fluctuated around \$0.95 to \$1.15 per pound for quality animals. Most of Belize’s beef was produced from extensive production systems. However feed-lot production systems already exist and further expanded in the Orange Walk district. The market for grain-fed beef became more popular,

especially catering to the tourists and Belizeans that have developed a taste for this specialty meat. Slaughter returns indicate that some 10,880 heads of cattle were slaughtered in 2003 as compared to 9,076 in 2002.

**1.3.4 Pig Production**

Pig producers were extremely satisfied with the marketing of their pigs as the farm gate price was good throughout the year, prices ranged from \$1.25 to \$1.50 per pound across the country. The good prices were partly due to policy decisions, increased pork consumption and reduced supply. During the Christmas season prices normally tend to be lower as a result of oversupply but this was not the case in 2003. The vibrant pig industry was reflected in slaughter returns of 19,003 heads as compared to 17,905 heads in 2002. This increase can be attributed to increased consumer demand, the ever expanding tourism industry and the expansion of agro-processing as new processors entered the business.



As part of the strategy to coordinate the activities of the pig industry the Belize Pig Council (BPC) was formed. The council was made up of key stakeholders of the industry. The council elected a president and its executive body. The council agreed to restructure into an association as the benefits and opportunities were greater. As an association they would be able to collect the cess on pigs slaughtered, an income that previously went to the Belize Livestock Producers

Association. They agreed that from the cess collected \$0.50 will be put in a disaster development fund.

### 1.3.5 Small Ruminants

Genetic improvement which is the number one constraint was given special attention in 2003. Mutton (sheep meat) consumption was minimal in Belize as the quality and consistency of availability did not lend itself to greater consumer appreciation. Several factors were cited as causes: sale of old stock, low meat to bone ratio, extensive production and, poor genetics and inbreeding. Meat goat production was also introduced as a new initiative to promote its production as an alternative to small producers with scarce resources.

### 1.3.6 Sheep

Another batch of 17 eweling and 13 rams was ordered from Queretaro, Mexico and these are expected to arrive in country in late January of 2004. The breed introduced was the Dorper as this breed is heavy muscled with good growth rate and is a tropicalized breed. The Dorper is to be crossed with the local Black Belly and other breeds to upgrade the genetic pool of the national herd with the goal of producing mutton of better quality. A comprehensive program was put in place to improve management of herds, marketing and to promote the consumption of mutton.



Discussions were held for the establishment of a small sheep herd at the Belize Youth Hostel. The purpose of the investment was to introduce small ruminant production to students as an economic activity after leaving the institution and as a source of food for the school. Slaughter returns indicated that mutton consumption is increasing as 1,137 heads were marketed in 2003. This trend is expected to continue as the quality of mutton has improved through the improvement of genetics of the national herd.

### 1.3.7 Goat

In September two pairs of pure-blood South African Boer goats were received from Tennessee, U.S.A. These animals came as a donation from Tom and Sandy Snyder of Critter Hill Farm. The donation of the goats is part of a new initiative promoting meat goat production by small-scale producers. They served as seed stock to initiate a pure-breed and cross-breed blood lines. Six doe were bought from different parts of the country to start the cross-breeding program at Central Farm. Several farmers took advantage of the buck service to diversify into meat type animals even though most of them have milk-type goats. The first offspring of this new importation are due in May of 2004. It is envisioned that with the rapidly growing tourist industry the demand for chevron (goat meat) will continue to increase.

### 1.3.8 Fallow Deer

In August five male deer were slaughtered to evaluate the dressing percentage and to test the market for acceptability of venison (deer meat). On average the deer had a dressing percentage of 52%. From the data collected it was concluded that the best time to slaughter deer is around 12 months of age when the deer weighs around 90 pounds live weight. Preliminary information indicated



*Deer in Central Farm, Cayo District*

that commercial venison production is not viable as consumers are not willing to pay more than \$3.50 per pound while the cost of production exceeded this value. The future of fallow deer production lies in sales for aesthetic value and as a tourist attraction at resorts. Nine fawns were born in 2003; five females and four males bringing the total herd at end of December 2003 to 28 heads.

### 1.3.9 Beekeeping



Honey production for 2003 was lower than anticipated as a result of deforestation, forest fires, the burning of sugarcane fields and the prolonged dry spell that affected the production of flora. Nonetheless production was up by 13% over that of 2002. Despite these constraints optimism was high among producers as this did not stop the re-formation of the Belize Beekeeping Council. Mr. Margarito Leiva, the largest producer, was elected as Chairman. Members of the council include representatives from the active cooperatives and other organizations like the CARD project and the Belize Audubon Society that are implementing beekeeping projects. Beekeepers managed from 2 to 400 hives each and many beekeepers are now collecting pollen as well, especially in the Cayo District, as the price for pollen is around \$20.00 per pound.

*Honey Production by District (Lbs.)*

Item	Belize	Cayo	Corozal	O/Walk	St. Creek	Toledo	Total
Honey	3,000	43,855	12,320	54,450	718	3,000	106,728
Pollen	None	390	None	50	None	None	440

Prior to 2001 Belize exported most of its honey to the European Union but in 2001 Belize was decertified by the E.U. as stringent trade regulations were implemented that Belize could not comply with. Part of the present strategy for honey production is the completion of the protocol and its implementation in order for Belize to be re-certified by the E.U.

### 1.4.0 Other Agricultural Development

#### 1.4.1 School Gardens

Each district established joint partnership with primary and secondary schools for the establishment of school gardens with the ultimate objective to complement school feeding programs improve nutrition and generate funds from the sale of surplus garden produce. Each extension officer was assigned 1 - 2 schools to work with, and these gardens promoted the use of family drip irrigation systems, use of organic fertilizers and the production of organic vegetables.

#### 1.4.2 National Agriculture and Trade Show

The National Agriculture and Trade Show Committee was responsible for organizing the 2003 National Agriculture and Trade Show which was held on May 16 – 18<sup>th</sup>. The 2003 show was considered very successful, featuring the flower show, crop exhibits, agro-processing exhibits, livestock display and auction, dog show, horse show, national rodeo etc. New features for the 2003 show were the petting zoo, the agro-processing display and the high flying motorcycle competition. Over 35,000 people attended the show. Total revenues for this



*National Agriculture and Trade Show 2003*

year's show were \$ 155,104, mostly coming from gate receipts and the sale of booths; \$ 17,000 was obtained as contributions. Total expenses were \$ 117,767, resulting in a profit of \$ 37,336.

The Farmers of the Year were Mr. Luis Enrique Chan from Corozal Town as the Senior Farmer of the Year, Ms. Ana Marilu Lazo, from Bomba in the Belize District as the Woman Farmer of the Year, and Mr. Byron Arnulfo Arrevalo, from 7 Miles in Cayo District as the Junior Farmer of the Year.

### **1.4.3 BIARD Initiative**

Central Farm Research Station saw much improvement in regards to its contribution to the national development agenda. Of particular importance was the work on the re-engineering of Central Farm into a semi-autonomous body called the Belize Institute of Agricultural Research and Development (BIARD). Given that BIARD passed into law it will need to engage in dialogue with the private sector; most importantly it has to establish the finance and technical capability to gain credibility both on the national and international scene.

### **1.4.4 Mechanical and Custom Services**



In 2003 the agricultural engineering division of the Ministry made significant progress in the delivery of vehicle maintenance and repair service to the Ministry, tractor and bulldozer services to farmers, soil and water technology assistance to farmers, and other appropriate technology advice. The machinery services continued to play a major role in providing land preparation services for crop production both at Central Farm and the farming community, and providing operational monies for the section. A total of one hundred and eighty three (183) farmers made use of the rubber wheel tractor service in which a total of 1239 acres were prepared. The rubber wheel tractor service generated revenues totaling \$31,200.4. The bulldozer service only worked for 43 farmers this year and collected revenue amounting to \$28,481.90.

### **1.4.5 Soil and Water Technology**

Because of the successful adoption of the family drip irrigation system by farmers it was decided to expand the program. A second proposal was written by the agricultural engineering section of Central Farm to procure additional systems for farmers and this was submitted to the ROC for funding. Together a total of 30 systems, costing just over \$ 600 each, were procured and farmers were required to pay 50 % of the cost. Earnings from the first 30 systems were used to purchase other systems to continue the program. In the second phase, priority was given to school gardens and the prison. By years end, a total of 39 family drip systems had been installed countrywide, including 2 for agricultural purposes at the Kolby Foundation prison in Hattieville. The soil and water/technology unit started focusing its work on a larger scale as well, and thereby providing large scale irrigation service to companies such as D & L Fruit and Vegetable Ltd, the Soybean project, pepper production in the Cowpen area and over 100 acres in irrigated rice in Punta Gorda just to name a few.

#### 1.4.6 Agroforestry

Agro forestry sales were slow during the period April to June due to the dry season but picked up in the middle to the latter part of the year. During the year, over 15,000 agroforestry seedlings, mostly teak and cedar were sold from the nursery generating \$ 15,880 in revenue. A total of 20,800 plants were produced up 4 % from 2002. This program continued to supply high quality seedlings to plant for use as timber trees.

#### 1.4.7 Agro-processing

The Ministry of Agriculture along with active collaborators trained processors not only in product development but also in food safety which lead to enhanced quality, safe and wholesome foods targeted for both local and international markets. The main areas of focus were:

- Assessment of cost of production for products commonly manufactured
- Technical interventions to improve quality and acceptability of manufactured products
- Product enhancement through labeling and packaging
- Technical training in selected product development
- Emphasis on Food Safety through GAP's and GMP's
- Commercialization of new products in districts
- Establishment of centralized packing plants
- Construction and placement of product racks in six districts

A review and evaluation of medium and cottage size processing entities indicated that there were 52 groups of active processors with a membership of 398 persons (see table below).

District	# of Active Groups	Total Membership	Products Manufactured
Corozal	8	12	Meats, cheese, cream, horchata, peanut butter, habanero sauce, coconut oil, dried papaya, jams/ jellies
Orange Walk	5	35	Lactose, jams, salsa casera, meats, sauces, pollen and various honey products
Belize	7	136	Salsa casera, confectionary, cashew nuts, peanuts, jams and jellies, wines, cashew stews
Cayo	10	60	Lactose, jams and jellies, jalapenos, vinegar, juices
Stann Creek	12	125	Wines, jams, gungude, cerebuiti, cereal products, recado, chips
Toledo	10	30	Lactose, jams, spices, wines, dry ginger

Of these products, each district selected 3 - 4 of them with a high degree of marketing potential for development and follow-up. In many cases, market testing was carried out, especially if the product was a new one; some examples were dried ground onions, dried whole and ground habanero peppers, freshly chilled ground foods (including cassava, yam and cocoyam) and frozen papaya. In the case of the freshly chilled ground foods, the product sold very well but consumers indicated that they preferred 1 – 2 lb packages rather than the five pound packages.

The number and appearance of processed foods on shelves also increased significantly during the year. Over 50 different labels were designed with assistance from the Ministry and these labels were used and paid for by processors from each of the six districts. Attempts were made to place

these products on shelves especially in gas stations and supermarkets. The feedback from the stores and gas stations was encouraging and therefore this particular activity has stimulated significant interest in local processing. It is expected that this activity will lead to greater promotion and increased sales of locally processed products in the coming years.

***Competitive level of Various Processed Products (1 being the least competitive due to high COP)***

<b>District</b>	<b>Products</b>	<b>Competitive level ( 1-10)</b>
<b>Corozal:</b>	Cheese	4
	Cream	4
	Peanut butter	4
	Fruit cakes	5
	Jams and jellies ( papaya)	6
<b>Orange Walk:</b>	Salsa Casera	2
<b>Belize :</b>	Pine apple syrups	5
	Mango jam	6
<b>Cayo:</b>	Seasoned chicken	6
<b>Stann Creek :</b>	Cassava bread	6
	Cerebuiti	6
	Marmalade	4
<b>Toledo:</b>	Cheese	4
	Dried ginger	5

## **2. FISHERIES DEPARTMENT**

The Department worked very closely with its partners in development and conservation (BAS, TNC, CRFM, CZMA/I, MBRS, GEF etc.) to identify funding which supported its major activities throughout the year. The Belize Fisheries Department through its mission “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”, continued to ensure the steady development of the sector and ensure the integrity, productivity and sustainability of our ecosystems. The fisheries sector still continued to contribute significantly to Belize’s economy with export earnings in 2003 valued at \$110,644,017.56.

### **Trends in the export market value of marine products**

<b>Commodities</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
<b>Lobster</b>	\$ 12,777,400.00	\$ 12,814,000.00	\$ 13,489,000
<b>Conch</b>	\$ 4,615,960.04	\$ 3,237,000.00	\$ 4,138,000.00
<b>Conch trimming</b>	\$ 28,350.00	\$ 197,331.68	
<b>Lobster meat</b>	\$ 195,760.00	\$ 422,304.45	\$ 104,229.10
<b>Live Conch</b>	\$ 2,269.69		
<b>Whole fish</b>	\$ 11,875.00	\$ 124,000.00	\$ 500.00

<b>Stone crab</b>	\$ 706.13		\$ 25,117.88
<b>Farm shrimp</b>	\$ 48,738,671.25	\$ 52,158,000.00	\$ 91,848,000.00
<b>Pink shrimp</b>	\$ 194,613.82	\$ 1,405,748.62	\$ 998,154.25
<b>Shark</b>		\$ 12,500.00	
<b>Fish Fillet</b>	\$ 390.56	\$ 127,159.00	\$ 403.00
<b>Aquarium Fish</b>	\$ 37,629.20	\$ 30,300.98	\$ 41,599.00
<b>Ground Conch</b>	\$ 57,306.40	\$ 6,708.19	
<b>Total</b>	<b>\$ 66,660,932.09</b>	<b>\$ 70,535,052.92</b>	<b>\$ 110,644,003.23</b>

### 2.1.0 Capture Fishery

Nominal fisheries production for the year 2003 showed an increase of 20%, 2.0%, and 76% for conch, lobster and farmed shrimp compared to 2002, respectively. However, the nominal production for and marine shrimp showed a decrease. The majority of the lobster head meat and the fin fish production were sold on the growing local market due primarily to the increase in the demand for sea food by the tourism sector. In real terms exported lobster output expanded from 565,000 lbs (tail, meat) to 565,000 lbs; exported conch expanded from 499,000 to 565,000 lbs (conch meat, trimming, ground conch) while exported shrimp output expanded from 6.3 million lbs to 16.1 million lbs of tail.

The decrease in production for marine shrimp was attributed to low recruitment of this species in the previous season due to poor environmental conditions, the late arrival of shrimp trawlers from neighboring Honduras and a drastic reduction in fishing effort since only four vessels fished this season compared to nine in the previous year.

### 2.1.1 Management of the Queen Conch Fishery

The status of the Queen Conch in Belize was similar to that in most countries of the Wider-Caribbean region. Production was on a constant decline and this resource was referred to as being either overexploited to the extent that many stocks were depleted or in need of more focused management to mitigate against its possible collapse. As a result, the Secretariat of the Convention for the Regulation of International Trade of Endangered Species (CITES) has mandated Queen Conch exporting countries to assess the status of their fisheries and to implement the necessary management measures in order to ensure the sustainable exploitation of the species. Failure to comply with this notification by CITES will result in the imposition of an export embargo for this commodity. Belize was given a deadline of September 2004 to comply with the notification by CITES. As a result, the Fisheries Department initiated the necessary surveys in November 2003 with assistance from the Caribbean Regional Fisheries Mechanism (CRFM). The results from these surveys allowed for the revision of current management of the Queen Conch and recommendations for additional measures which will ensure the sustainability of this very valuable resource.

### **2.1.2 Management of the High Seas Fishery**

2003 was historical year for the management of Belize's High Seas Fishery. The Belize Fisheries Department in collaboration with the International Merchant Marine Registry of Belize (IMMARBE) initiated the licensing of Belizean Flagged Fishing Vessels in accordance with the High Seas Fisheries Act. Furthermore Belize made substantial efforts to cooperate with all relevant international organizations and management bodies in order to assure compliance with regulations of the world's high seas fishery stocks. A new unit was created in the Department called the Captain whose primary function was to issue High Seas Fishing Licenses to vessels registered by IMMARBE and to monitor and ensure their compliance with the necessary regulations.

In November of 2003, Belize attended the 18<sup>th</sup> regular meeting of the International Convention for the Conservation of Atlantic Tuna and Tuna-like species in Dublin Ireland. The official delegation which consisted of the Fisheries Administrator and the Registrar was successful in negotiating the lifting of international trade sanctions which were imposed on Belize as a result of non-compliance with ICCAT regulations. This resolution came into effect on January 1<sup>st</sup>, 2004.

## **2.2.0 Ecosystems Management**

### **2.2.1 Enforcement**

The Fisheries Prosecution branch had forty-five convictions out of forty-nine arrests producing \$85,975 in fines and penalties for the general revenue. Seventy-seven percent of the offenses were by Belizeans, 15 % by Hondurans and 8 % by Guatemalans. Although there were more arrests in 2003 than in 2002, the equipment confiscation was lower since the highest number of offenders (75 %) was Belizean fishermen rather than non-Belizean from neighboring countries. However, product confiscation was high which facilitated a large contribution to the feeding program. Enforcement in the marine reserves was very regular and effective. There was more coordination with the reserves especially in enforcing the new grouper regulations recently brought into force.

### **2.2.2 Monitoring**

Monitoring for lobster, conch and finfish continued at the reserves. A special conch abundance and distribution survey was conducted by personnel from the Capture Fisheries Unit, CCU and the marine reserves. The data was compiled and should be analyzed shortly. This was as a result of a CITES mandate in order to evaluate the sustainability of Queen Conch (*Strombus gigas*) in Belize. Ecosystems monitoring was standardized and regularized in 2003 during the final training for the MBRS Synoptic Monitoring Program (SMP). The SMP will look at sea grass and mangrove productivity as well as coral reef health starting in 2004.

### **2.2.3 Spawning Aggregation Monitoring**

The staff from the various reserves and from CCU participated in a national grouper aggregation monitoring during January, February and March 2003. This was a joint effort by the Grouper Spawning Aggregation Monitoring Working Group and funded by The Nature Conservancy and WWF. The MBRS Project donated a SPAGS monitoring vessel and will assist with some logistic support in 2004. With the closure of 11 grouper spawning banks, displaced fishermen from Hopkins were hired to assist in the data collection. The SPAGS monitoring result was made public in the first newsletter issue of January 2004.

#### 2.2.4 Turtle Monitoring

Monitoring of turtle nesting sites continued at all the reserves and at the Gales Point area. The Gales Point monitoring program was conducted by the Gales Point community. This group was assisted by the Turtle Monitoring Working Group which was headed by the Fisheries Department. An outline was developed for the turtle program and implementation commenced in 2004.

#### 2.3.0 Aquaculture and Inland Fisheries

##### 2.3.1 Shrimp Aquaculture

There were 7,904 acres of production ponds in operation in 2002. The total amount of production ponds at the end of 2003 was 8,407 acres. This increase came mainly from the commissioning of a new farm (Melinda Mariculture), as well as expansions in pond construction from pre-existing operations. There were 14 shrimp farms in operation at the end of 2003.

In 2003 farmed shrimp produce was estimated at 33 million pounds of whole shrimp, which translated to roughly 22 million pounds of shrimp tails, the primary marketed commodity. The market price of exported shrimp declined sharply over the last 3 years. The larger size classes of shrimp tails that were selling for US \$6 - \$8 per pound 3 years ago, declined to US \$4.12 per pound in 2003.

##### *Shrimp Production and Revenues*

Year	No. of Farms	Area farmed in acres	Export Tails) in lbs	Export Revenues Bz\$	Average Price/lb
1992	3	533 Acres	1,083,158 lbs.	\$ 6,452,944	\$5.96
1993	4	1,000 Acres	1,559,618 lbs.	\$ 10,539,167	\$6.76
1994	5	1,000 Acres	1,311,427 lbs.	\$ 8,689,352	\$6.62
1995	6	1,100 Acres	1,168,822 lbs.	\$ 10,401,100	\$8.90
1996	6	1,100 Acres	1,574,283 lbs.	\$ 8,900,000	\$5.65
1997	6	1,370 Acres	2,710,967 lbs.	\$ 13,566,522	\$5.00
1998	6	1,394 Acres	3,620,151 lbs.	\$ 22,596,572	\$6.24
1999	8	3,100 Acres	6,974,120 lbs.	\$ 46,007,000	\$6.60
2000	12	5,188 Acres	5,027,352 lbs.	\$ 47,458,117	\$9.44
2001	11	5,818 Acres	7,127,374 lbs	\$ 48,738,671	\$6.84
2002	12	6,588 Acres	6,263,223 lbs.	\$ 51,793,845	\$8.27
2003	13	6,788 Acres	<b>(22,300,000lbs.)</b>	<b>\$91,800,000</b>	\$4.12

##### 2.3.2 Finfish Farming Operations

The small-scale fish farming operations accounted for about 10.5 acres of production ponds in 2003. Fresh Catch Ltd was the only large-scale commercial-oriented operation – this enterprise

completed the construction of over 40 production ponds 0.7 ha. each and 2 reservoirs of 8 acres each. There was an emerging interest in aquaculture by various farmers especially in northern Belize - mainly the Mennonite community in Shipyard and Little Belize, as well as from other Cooperative groups and individual cane farmers. The main interest was in tilapia farming due to fast economic returns and market demands.



*Nursery tank for tilapia seed stock*

The Biscayne Seed Stock Production Facility saw some improvements in regards to infrastructure and the purchasing of supplies and equipment. This included the excavation of a water reservoir, the drilling of two-eight inch diameter wells, the construction of four concrete brood stock tanks, and the purchasing of equipment such as a diesel water pump, weed eater, water vat, lawnmower and a fiberglass canoe. As a result, seed stock production has increased from 5,000 in 2002 to 26,500 in 2003. This represents over 500% increase when compared to 2002 production. During 2003 the AQUIF Unit produced and sold fingerlings; the revenues generated from these sales were used to purchase supplies and equipment for the Biscayne fish farm.

### 3. COOPERATIVES & CREDIT UNION DEPARTMENT

The year 2003 was busy for the Department of Cooperatives and Credit Unions as it helped to coordinate many efforts for the promotion and sustainable development of cooperatives and credit unions. These included onsite and group trainings, meetings/forums to give advice and to conduct or ensure that elections were properly conducted, on-site inspections, feasibility studies, audits, production of monthly news briefs, press releases, media coverage, and other technical assistance.



*Agro processing*

In its quest to achieve economic independence of the rural areas and the attainment of the Ministry's mission of food security, the department worked with agriculture cooperatives to produce varieties of traditional and non-traditional crops that included cabbages, carrots, cassava, organic cacao, organic rice, peanuts, pineapples, and potatoes. It also worked with them to promote and produce agro-processing and agro-forestry products.

Credit Unions (Savings Cooperatives) with its over 82,000 members, \$280 million assets, \$215 million in savings, continued to modernize its financial services to members and continued to work with the department in adhering to stricter supervision. Figures as of November 2003 indicate a \$43 million increase in assets since 2002, a \$37 million increase in savings, and a 7,000 increase in membership.



Other cooperatives were very active during 2003. Fishing Cooperatives with over 13,000 members, membership shares at over \$3 million, fixed assets at over \$8 million and capital at over \$9 million, also shared in the modernization efforts as they worked to ensure international standards and the introduction of new products. Livestock Cooperatives were also active as they continued in their

production of cattle, chickens, honey, honey pollen, pigs, and royal jelly. Taxi Cooperatives also made their impact on the local and the tourism sector. Societies were strengthened, and in some instances, amalgamated to make further positive impacts in their areas of operations.

Credit Unions celebrated Credit Union Week, October 12-18, 2003 under the theme “**Credit Unions – Heart of Our Communities;**” plans were already underway to join millions of cooperators worldwide in celebrating International Cooperatives Day in July 2004. Activities for Cooperatives Week were geared toward promoting Cooperative history, achievements, products and services, and to foster recognition of cooperatives and their many economic and social contributions to the Belizean society. It was envisaged that the recently introduced Large Cooperative and Small Cooperative of the Year Awards acted as a stimulus for excellence and as a symbol for the recognition of well-managed and successful cooperative societies.

The department also continued with its effort of technical assistance to credit unions. Under the chairmanship of the Registrar of Cooperatives and Credit Unions, and the membership of the Belize Credit Union League, Holy Redeemer and St. Francis Xavier Credit Union, and the Credit Union Managers Association, the department reviewed and recommended several preventative and curative measures to assist credit unions.

During the year 2004, the department plans to increase efforts in supervision of cooperatives and credit unions in its quest to ensure accountability and due observance of the Cooperative and Credit Union Act. It will also work on the strengthening of cooperatives that are deemed active and liquidate those societies that have remained dormant for an extended period of time.

**Overall Objective:** The Department’s overall objective is to provide the highest quality of service in the most economic, efficient, and effective manner within the resources available.

**Specific Objectives:**

1. Registration, administration and regulatory functions
2. Provide expert and authoritative advice for societies requesting, or in need of assistance
3. Collection and maintenance of accurate and reliable statistics and other information on all societies for the benefit of their members and/or the general public
4. Promotion of financial stability of all registered societies
5. Education
6. Ensuring that Societies conform to statutory, legal and procedural requirements including the submission of monthly financial statements, annual returns and accounts, and other requested returns, while ensuring that the appropriate information is supplied to members
7. Ensuring that societies benefit from the legal and other advantages of being registered
8. Maintenance of a record of annual returns and other information in order to produce the data required for reports to Ministries/ House of Representative, etc.

**3.1.0 Business and Entrepreneurial Development**

As part of the department’s mission of “strategic management of human, technical, financial and other resources for the sustainable development of Cooperatives and Credit Unions as business oriented units in the socio-economic development of Belize,” the department worked with many

cooperatives and pre-cooperatives in the attainment of improved management, improved visibility and/or image, improved or new products, increased profitability, and increased membership.

In an effort to assist credit unions to move to higher standards of performance and operations, and to provide competitive and outstanding services to their members, the Department, through financial assistance from the Minister of Credit Unions, sponsored a working visit to Tallahassee, Florida, USA in February 2003. The main objective of the visit was to obtain ideas, initiatives and materials that could contribute to the growth of the Belize Credit Union Movement. Target areas were:



*Trip to Florida, USA*

1. potential investment opportunities
2. credit administration and delinquency control systems
3. policy/procedure development
4. checking accounts and ATM services
5. marketing practices
6. establishment of sister relations for possible future attachments/assistance, etc.

Participants returned with a wealth of new ideas and experiences to adapt to their own credit unions.

### **3.2 Education and Promotion**

Education from inception through developmental stages was a vital component of the department's portfolio. In its objective of educating and promoting the Cooperative and Credit Union Movement, the department embarked on a number of activities. These included training sessions, school visits and presentations, production of educational pamphlets and monthly news briefs, production of a documentary on credit unions in Belize, and presentations at conventions. Fourteen training sessions and 19 school visits/presentations were conducted by the Department of Cooperatives in 2003.

#### **3.2.1 Promotion and Information Dissemination**

1. Establishment of an information desk at the department for the general public to have access to handouts on Cooperatives and Credit Unions
2. Dissemination of information on Cooperatives and Credit Unions at the Fiesta Ramah in Orange Walk
3. Collaborated effort with Agriculture Department in preparing a September Celebrations float in Orange Walk
4. Assisted with an agro-processing exhibition in Corozal which entailed local Cooperatives participation
5. Attendance at the National Agriculture and Trade Show in Belmopan
6. Cashew Producers Cooperative attendance at BEL-PROCONEX
7. Distribution of pamphlets and brochures at Agro-Processing and Information Exhibit in Orange Walk
8. Facilitation and participation at the 2<sup>nd</sup> Annual Credit Union Convention

9. Dissemination of a Monthly News brief, which replaced the Department's Quarterly Newsletter
10. Participation on Radio Talk Shows:
  - Love FM - Promotion of Processing of Products in Belize done by Cooperative and other groups (Agro-Processing, Trade and Expo Exhibition)
  - Esterio Tu y Yo - Promotion of Credit Union Week, Orange Walk
  - Esterio Amor - Promotion of Credit Union Week, Belize City
  - Radio Bahia - Promotion of Credit Union Week, Corozal District

### **3.2.2 Staff Training**

The department held quarterly staff meetings and an annual strategic planning session. It also commenced training in Financial Accounting to ensure improved competence in inspection and supervision of cooperatives and credit unions, and to ensure compliance of the PEARLS-M monitoring system. Officers also attended demonstrations and courses such as those held at the credit union convention 2003 and at the ROC Technical Mission.

### **3.3.0 Regulatory and Inspection**

As of December 31, 2003, the registry of Co-operatives maintained by the department accounted for 285 societies. These included the following types:

1. Agricultural Cooperatives
2. Credit Unions
3. Fishing Cooperatives
4. Housing Cooperatives
5. Industrial Cooperatives
6. Livestock Cooperatives
7. Taxi Cooperatives
8. Tourism Cooperatives
9. Consumer Cooperative
10. Money Exchange Cooperative
11. Consumer Cooperative (Peseros)

#### **3.3.1 New Societies**

Although there were many proposed groups only one, the Determine Small Farmers Co-operative Society Ltd. of Burrell Boom Village, Belize District was registered; the Unit assisted the cooperative in the checking of its by-laws. The Proposed Maya Line Taxi was in its final stage before registration. Others such as the Proposed PG. Beekeepers have not as yet satisfied the requirements for registration. Gone are the days when societies were registered and subsequently the relevant training was received. All proposed societies must prove that they can be viable.

#### **3.3.2 Societies under Liquidation**

In November 2003, the department decided to conduct the liquidations that were gazetted in 1996 which were not dealt with. This led to the assignment of one officer to deal only with liquidations and an updated list of 114 cooperative societies from the then 91. The notice of Intent to Liquidate was sent for publishing in the Government Gazette and the Amandala Newspaper.

### 3.3.3 Audits

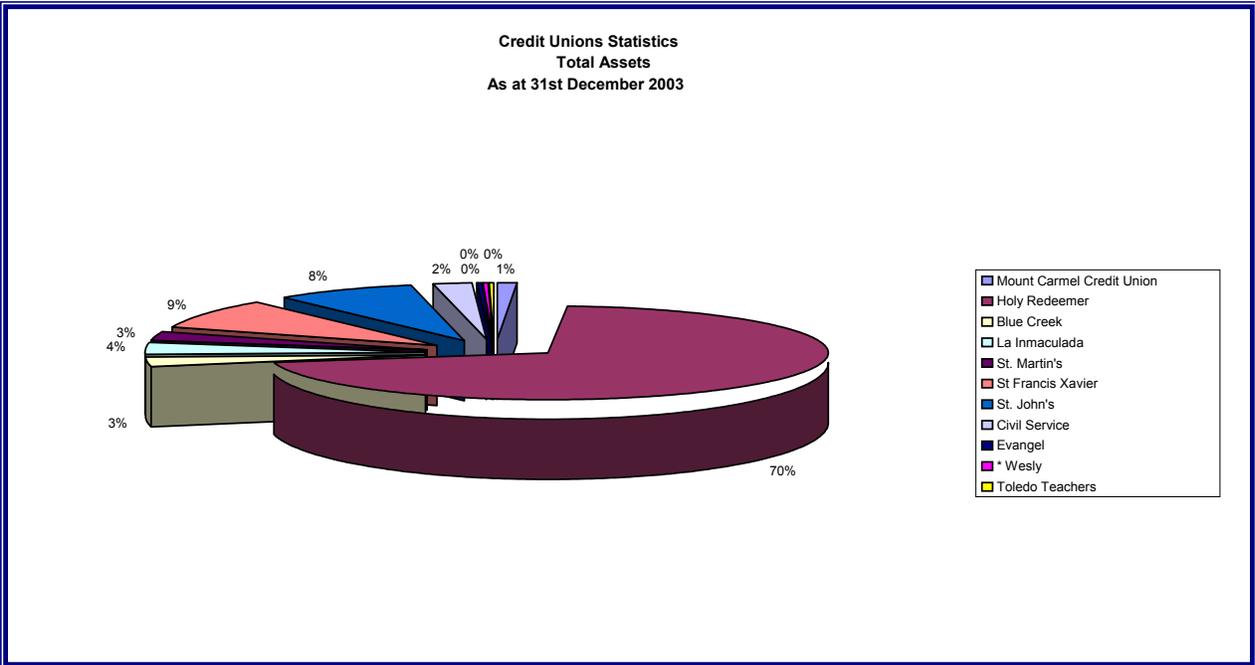
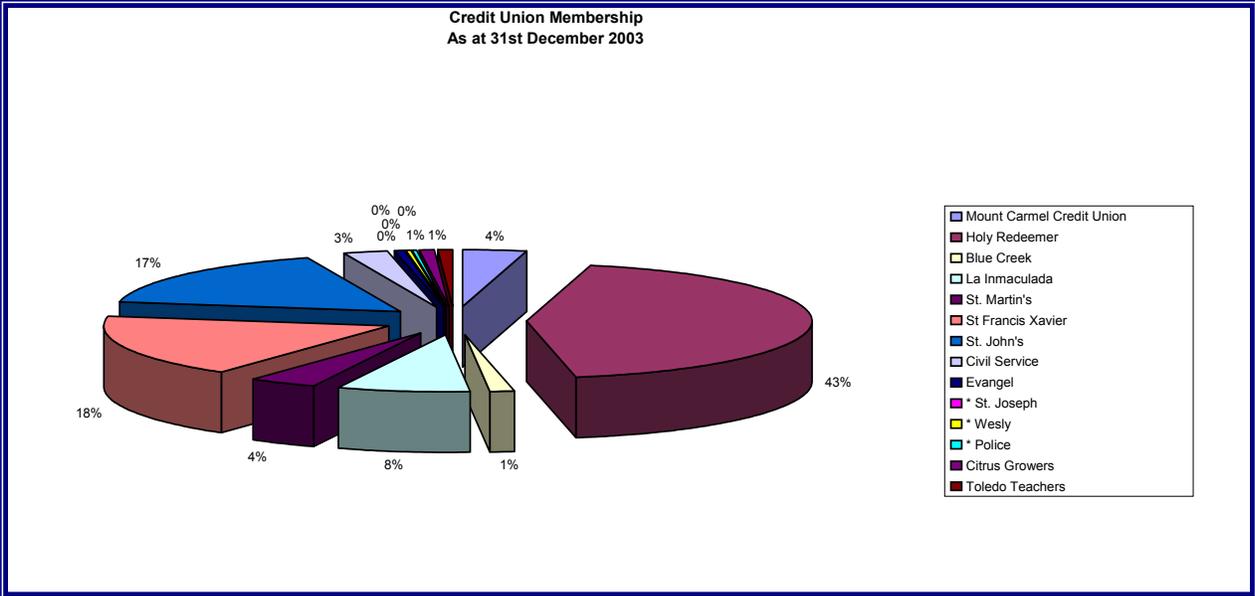
The Department completed or commenced audits for sixteen societies. Under the new system, a fee of \$1,000.00 was charged by the department to conduct audits. Most of these societies were able to defray that expense. As a means of generating additional income, audit was conducted for the Belize Cane Farmers Association Corozal Division. There were also requests from the Grain Growers Association and the Toledo Cacao Association; however, due to human resources constraint, these audits were not undertaken.

### 3.3.4 Statistics

Statistics were prepared using mechanisms to ensure accurate data. Due to internal problems within certain credit unions, however, estimated figures had to be used for Citrus Growers and Workers, Police, St. Joseph, and Wesley Credit Unions.

#### CREDIT UNION STATISTICS AS AT DECEMBER 31, 2003

Credit Union	Members	Deposits	Share Capital	Total Savings	Total Assets	Reserves	No. Loans	Loans Disbursed	Loans Outstanding
Blue Creek	1,143	-	5,765,408.21	5,765,408.21	7,610,686.53	668,043.48	257	3,668,144.21	5,599,664.08
Citrus Growers	740	13,526.41	261,853.20	275,379.61	302,151.33	4,717.16	744	392,466.00	199,697.90
Civil Service	2268	32,229.19	2,964,155.51	2,996,384.70	6,202,243.60	279,385.12	860	776,204.73	5,503,329.42
Evangel	325	239,631.24	517,494.50	757,125.74	971,843.72	52,834.33	72	169,293.80	869,900.62
Holy Redeemer	35,609	22,859,371.04	130,318,651.38	153,178,022.42	199,218,644.32	15,749.50	13,491	59,415,354.48	162,219,556.30
La Inmaculada	6170	223,111.00	8,164,920.00	8,388,031.00	9,787,881.00	539,557.00	198	283,296.00	8,769,330.00
Mount Carmel	3025	751,515.00	1,854,272.00	2,605,787.00	2,771,900.00	(971,541.00)	40	57,621.50	2,404,824.00
Police	165	6,532.90	77,709.50	64,242.40	209,513.70	14,648.70	99	79,227.00	195,404.00
St. Francis									
Xavier	14802	20,154,663.87	15,894,375.28	36,049,039.15	24,175,293.65	1,241,879.09	6,028	10,461,348.49	21,240,773.73
St. John's	13937	2,115,774.62	15,072,627.00	17,188,401.62	22,621,457.98	1,131,988.30	5,490	8,687,617.05	18,649,024.36
St. Joseph	221	4,431.00	55,822.20	60,253.20	50,596.35	772.80	139	10,620.75	43,451.10
St. Martin's	3184	384,224.42	4,408,301.85	4,792,526.27	7,113,008.16	195,093.50	1,764	291,292.49	5,718,834.63
Toledo Teachers	773	20,723.38	794,666.05	815,389.43	1,086,508.96	7,334.42	117	737,591.42	829,452.06
Wesley	157	16,750.58	283,840.20	300,590.78	333,005.15	4,885.85	91	208,545.64	250,864.12
<b>TOTALS</b>	<b>82,519</b>	<b>46,822,484.65</b>	<b>180,668,688.67</b>	<b>227,471,173.32</b>	<b>274,844,047.92</b>	<b>2,517,304.77</b>	<b>29,133</b>	<b>81,570,479.35</b>	<b>226,894,442.24</b>



**3.3.5 Inspection and Inquiry**

Regular inspection and verifications were carried out for most active societies in all three zones of the country. Regular cash inspections were also conducted. In most cases due to the lack of financial resources inspections were carried out at the same time as verifications. There were still some problems with the cash inspection returns that were submitted by officers. It was detected that this shortfall was as a consequence of the lack of training; necessary steps will be taken to correct this situation. Returns submitted did not show much problem but rather potential for problem. There were many instances where societies kept too large liquid cash on hand. The

potential for problems were discussed with societies and possible solutions to remedy the situation given.

Inspections included but were not limited to:

1. Cash receipts
2. Cash disbursements, both from bank and cash on hand
3. Postings
4. Bank statements
5. Members' accounts
6. Minutes of meetings where warranted

From the above table it is obvious that most inspections carried out were for credit unions since emphasis was placed on the proper supervision of these entities. Even with all the work done with co-operatives there was a lot to be desired, particularly from some of the "smaller" credit unions and co-operatives.

### **3.3.6 Accounting Work**

During the year under review the department continued to assist societies in the writing up of their accounts books. We also assisted various societies in the computerization of their accounts.

### **3.4.0 Plans**

The department needs to increase its efforts in supervision and regulation. It must also leave the auditing functions of larger registered societies, particularly credit unions and fishing cooperatives, to private auditors. This will leave the Audit Team to conduct audit services for smaller registered societies, and carry out long overdue liquidations that have been tying up millions of cooperative assets. To augment the supervision, the department will strive to facilitate education and trainings and credit to cooperatives so as to alleviate some of the problems facing societies.

Meetings of the Credit Union Technical Assistance Board must continue to produce innovative and preventative options for credit unions. Meanwhile, the department must continue to focus its efforts in ensuring that the following areas of concern are addressed:

1. Internal Control Systems of cooperatives and credit unions
2. Implementation of PEARLS-M Standards
3. Vigilant Credit Program Administration
4. Vigilant Delinquency Control
5. Implementation of a Marketing Plan for Credit Unions
6. Functioning of a Credit Union Appeals Tribunal

## **4. PROJECTS & STATUTORY BODIES**

### **4.1.0 Belize Livestock Producers Association**

Beef cattle production in Belize has improved significantly in the last ten years, primarily influenced by the effects of importation of breeding stock from Mexico, the use of artificial insemination with European beef breeds and improvements in feeding systems. Quality improvement is starting to be seen in the beef being sold locally. Market size steers and heifers,

from 800 to 1,100 pounds were being produced at 24 months of age or much less in many cases, with the accompanying increase in tenderness.

The challenge facing the industry now is the standardization of quality, through both improved genetics and nutrition, across all producer herds, health inspection and traceability for health and sanitation control, particularly in the face of the new developments in the hemisphere with the discovery of Bovine Spongiform Encephalopathy (BSE or Mad Cow Disease) in the USA and Canada, and the expansion of producer herds to take advantage of growing market potentials in the region.

#### **4.2.0 Coastal Zone Management Authority**

The agency has undertaken a range of activities related to policy development, monitoring and research, coastal planning, data management, education and public awareness, marine protected areas network strengthening, and capacity building.

A draft National Aquaculture Policy and Land Use Plan for Belize was prepared by Tunich Nah Consultants after several rounds of consultations with the key stakeholder groups. The finalization of this draft policy required further collaboration and discussions between the Fisheries Department and the Belize Shrimp Grower's Association.

During 2003 the major activities under the ConGREH project were implemented and include coral



*Installation of mooring buoys at Goff's Caye to reduce impacts of anchors*

reef monitoring of visitor impacts, preparation and distribution of educational brochures and installation of 10 mooring buoys. The ConGREH Project was in the last stage of implementation with tour guide training and installation of signs to be completed. Regular monitoring of the site highlighted that the high level of visitation was a major cause for concern. This initiated the development of a carrying capacity study, with socio-economic surveys targeting the users of Goff's Caye as the first component of this study. The user surveys are being analyzed to provide data to guide the design of management arrangement for the area. The carrying capacity study should take one to two years to be completed, by mid 2005.

The CZMI coral reef monitoring program was expanded using the MBRS Synoptic Monitoring Protocol with an additional 9 back reef sites. Parameters monitored include benthic cover, coral health, and fish diversity and abundance.

#### **4.3.0 Belize Agricultural Health Authority (BAHA)**

During the reported period, BAHA's management and staff continued its work to fulfill the Authority's mission to providing optimum, competent and professional services in food safety, quarantine, plant and animal health in order to safeguard the health of the nation and facilitate trade.

The Profit & Loss statement for the reported period showed a 62% increase in revenue collected compared to last year. Government subvention accounted for 57.4% of total revenue, while BAHA generated 42.6% (\$1.3 million) of total revenue. The performance of the Authority was

constrained by budget deficits of \$389,108.62 caused by shortfalls in the contribution of Government. Despite these constraints, BAHA was able to provide the essential services crucial to ensuring the agricultural health and safety of the nation. BAHA also gained regional and international recognition as a model for superior practices in agricultural health and food safety.

#### **4.4.0 Community-Initiated Agriculture & Rural Development Project (CARD)**

**Cocoa Expansion:** The Toledo Cocoa Growers Association (TCGA), an export driven producer organization, was assisted in cocoa acreage expansion and improved organic production technology through a Cocoa Expansion Project. The TCGA had a five year marketing agreement to supply 200 metric tons of organic cacao to Green and Black, a fast growing British chocolate company. BEST was contracted as the service provider to deliver the assistance in collaboration with other interested agencies. The project cost was \$45,000.00 of which CARD sponsored 90%. Activities executed were: training in cocoa production technology; exposure of farmer and technical personnel to training and regional exchange field visits; demonstrations in field management techniques such as nursery site selection and establishment, staking, planting, pruning, harvesting and pest management. A user friendly training manual which can be used by trainers and farmers was produced. Additional assistance was provided to the TCGA to actively recruit members which presently consists of 300 growers.

A five year business plan was developed for the TCGA. This plan was instrumental for the TCGA to access additional assistance from DFID of approximately BZD 700,000 for a three year period and approximately BZD 200,000 from HIVOS.

**Honey Re-activation:** The Southern Beekeepers Cooperative and Punta Gorda Beekeepers were the beneficiaries of a \$70,000.00 project. The project was to re-activate the dormant honey industry in Toledo and Maya Mopan. Technical assistance encompassed the effective management of Africanized bees. Through this project two farmers were trained as apiary inspectors to provide technical services to thirty beekeepers who were recipient of a total of 150 colonies and equipment. These colonies served as a pilot apiary for further training and colony expansion. Farmers were exposed to organic honey production since there was a great demand for organic honey in Europe and the region lends itself to organic production.

**Institutional Strengthening:** Community workers technical expertise was strengthened in carrying out integrated development activities in the communities of the Southern Region of Belize. Emphasis was placed in the upgrading of skills in community development methods, social analysis and participatory rural appraisal. Key counter parts, Government and CBO's , NGO's and PSC members participated in these training sessions. A total of forty persons representing ten organizations such as CBO's, NGO's and GOB in the CARD project region have benefited from the training.

Approximately 140 persons mostly micro, small and medium sized entrepreneurs were sponsored to participate in agro processing, baking, beekeeping, agriculture, trade and marketing seminars. Most of the training was conducted within Belize.

Assistance was also provided to organizations such as the Toledo Alcalde Association and Toledo Village Council Association to improve the infrastructure of their organizations. The Toledo Maya Women Council also received assistance to improve the performance of the organization.

**Marketing/Women Development:** A survey of the informal market in Guatemala was conducted to provide information to producers in the region of potential market opportunities. In collaboration with the Women Development Officers GOB in the project region, women were empowered through training in food and nutrition, self esteem and assertiveness. Seminars and workshops on national gender policy, handicraft, and violence were also organized. Assistance was provided for the organization of women’s groups in three villages and one in Punta Gorda Town.

**Credit:** The RFS Component of the CARD Project assisted financially both the Citrus Growers and Workers Credit Union of Stann Creek District and the Toledo Teachers Credit Union of Toledo District in 2003 in the following manner:

1. Approved and disbursed a Line of Credit of BZD 125,000 to the Citrus Growers and Workers Credit Union. The Credit Union in turn approved 181 loans to men, women and youths micro entrepreneurs of Southern Stann Creek at the end of December 2003.
2. Approved a Three-Year Technical Assistance Grant to the Citrus Growers and Workers Credit Union for a total sum of BZD 194,784. A total of BZD 87,924 was disbursed in 2003 to finance the establishment and operation of a full fledge branch office in Independence Village.
3. In collaboration with the Central American Network of Microfinance, (REDCAMIF), CARD sponsored the participation of Mr. Justino Mendez, Branch Manager of the CGWCU and Mr. Leopoldo Romero, Manager of the Toledo Teachers Credit Union to the 6<sup>th</sup> Inter-American Forum in Microenterprise held in Guatemala City during the period September 02 to 06, 2003. Total cost of the event was BZD 4,400.

#### **4.5.0 Belize Marketing & Development Corporation**

As marketing continued to be one of the key constraints to agricultural development, the Belize Marketing and Development Corporation continued as the major player in commodities marketing, for coordinating both domestic and export activities. Rice continued to represent 60% of business activity while at the same time the corporation sought to support commodities such as red kidney beans, potato, carrots, and onions. While diversifying the commodity base, administrative and operational structures were re-energized. There are five buying centers across the country; the vision is to establish buying centers in the two remaining districts of Corozal and Stann Creek. The corporation’s plan was to get involved in the export of apple bananas, onions, and habanero peppers. Opportunities were seen in the domestic market for product enhancement in honey, and pulping of exotic fruits.

**Product Purchases:** During the fiscal year August 2002 to July 31 2003 the Corporation purchased products valued at \$7,990,065.90 from rice farmers and other producers who have joined in the Department of Agriculture thrust of import substitution.

#### **Purchase of Local Commodities (2002/03)**

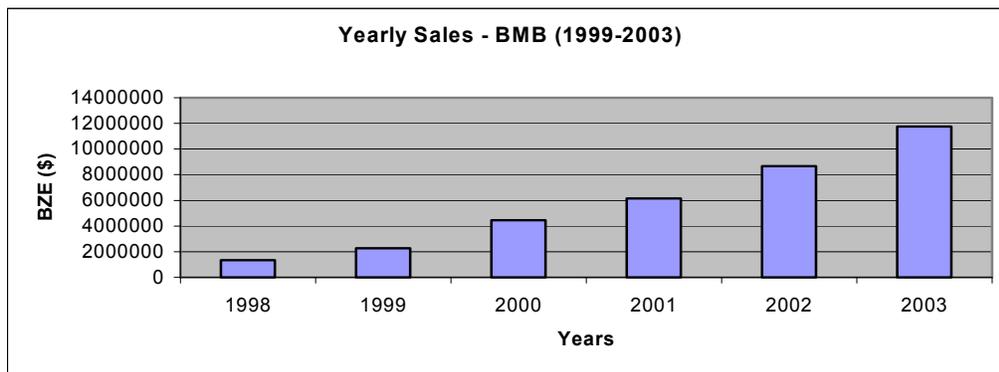
<b>Commodity</b>	<b>Volume (lbs)</b>	<b>Value (\$BZ)</b>
<b>Rice Paddy</b>	3,029,498	1,078,539.36

<b>Milled Rice</b>	10,369,599	5,937,987.65
<b>Potato</b>	98,143	56,075.80
<b>Carrots</b>	26,300	14,982.50
<b>RK Beans</b>	22,441	17,945.60
<b>Onions</b>	850,107	489,563.89
<b>Soybean</b>	1,401,595	419,384.20
<b>Soybean meal</b>	1,159,550	61,709.80
<b>Soybean oil</b>	145,520	35,586.40
<b>Agroprocessed food</b>	4, 837 units	13,193
<b>Total</b>		\$8,124,968.20

**Imports of Commodities (2002/03)**

<b>Commodity</b>	<b>Volume</b>	<b>Value (\$Bz)</b>
<b>Potato</b>	568,100 lbs	197,377.52
<b>Onion</b>	1,074,476 lbs	396,815.57
<b>Rice</b>	1,328,426 lbs	556,316.13
<b>Skimmed Milk</b>	10,164 cases	175,144.58
<b>Red Kidney Beans</b>	1,287,000 lbs	1,014,357.32
<b>Jars</b>	143,574 units	29,681.51
<b>Potato Seed</b>	213,750 lbs	145,669.42
<b>Total</b>		\$2,515,362.05

The graph below depicts an increase in sales from \$1,348,242 in 1999 to \$11,755,127.76 at the end of July 2003.



**Agro-processed Products:** Agro-processing provided additional income generating opportunities for small income families. It was a means of reducing wastage, enhancing food security, improving livelihoods for low-income groups and most important empowering women. Support continued for the agro-processing unit in the purchase of various quantities of stewed supa, stewed pumpkin, stewed papaya, pepper sauce, jalapeno pepper, and mixes of may plum and mango. Maintaining quality remained a challenge and hence the corporation was documenting the quality and standards that needed to be maintained by agro-processors. Entrepreneurs continued to face many

challenges, especially with the uncertainty that existed over access to finance and reliable markets. The corporation supported micro-agro-processors with the design and print of low cost labels.

## **5. PARTNER AGENCIES/ PROGRAMS**

### **5.1.0 United States Department of Agriculture (USDA)**

The year 2003 was very active during the first six months. The first detection of medfly occurred on the 30<sup>th</sup> of January and the last one on the 16<sup>th</sup> of July 2003. Thirteen detection sites occurred within the Stann Creek and Toledo Districts of Belize with a total of 82 medfly specimens captured. Because of the high number of repeated captures, the USDA was concerned about the probability of an established wild population within the country that the surveillance system in place was not detecting. An expert from the regional office came to Belize on two occasions to evaluate the detection and control measures being implemented. The results of these visits had two main conclusions:

- i. The Belize government through BAHA was doing a commendable job in the surveillance, control and eradication activities.
- ii. For Belize to be able to know whether an established wild population existed, a formal fruit sampling program had to be implemented for an extended period of time. Dr. Gary Steck, a taxonomist and curator for the Florida Department of Agriculture from the Bureau of Entomology, Nematology and Plant pathology in Gainesville Florida was identified and provided the training for the sampling program.

The year 2003 was classified as a successful in controlling all medfly detections which occurred. The provision of supplies and training showed the commitment of the USDA to maintain a close working relationship with the Belize Ministry of Agriculture and The Belize Agricultural Health Authority.

### **5.2.0 Regional Unit for Technical Assistance (RUTA)**

The Regional Unit For Technical Assistance (RUTA) was created with the intention of contributing to the expansion of national and regional capabilities for policy analysis and the design and implementation of projects in the context of a strategy to make agriculture more competitive and lessen rural poverty, seeking greater local participation, sustainable management of natural resources and the development of markets for goods and services. The major accomplishments for 2003 were:

1. Strategic and management support to CARD: RUTA strongly contributed to the reformulation of the CARD project and facilitated agreement for support between GOB, CDB and IFAD. RUTA's Belize UTN also signed an MOU with CARD to provide assistance to the project in terms of market information, training in proposal writing and appraisal, and development of a business plan for a fruit dryer.
2. Technical assistance and logistical support to MAF/IICA on the development of sector strategy for the productive sector: RUTA Belize UTN was the counterpart for the section on International Trade. Various meetings were held with the working team; RUTA reviewed the draft document and input comments.

3. International trade & marketing: Prepared project concept document for MAF on market study for organic produce and submitted it to Mr. Balcet for possible funding by the World Bank.
4. Rural development: Completed proposal for Maya Mopan Village on request to MAF by Hon. Rodwell Ferguson of Stann Creek district. Presently lobbying is being done for funding.

### 5.3.0 Caribbean Agriculture Research & Development Institute

The CARDI (Belize Unit) Annual Technical Report 2003 covered two cropping seasons, the November/December 2002 planted crop which was harvested in March/April 2003, and the June/July 2003 planted crop and harvested in September/October 2003. Additional crops planted in the November/December 2003 season were not covered in this report since harvesting commenced in March/April 2004.

**Soybean:** Ninety-one soybean entries were planted in November 2002 in an unreplicated preliminary evaluation trial. Four entries were tested for the first time. A large number of entries yielded more than the control **CARDI S-15**, which had yields of 380 g plot<sup>-1</sup>. Three entries, **CARDI 92-08**, **CARDI 92-15** and **Cristilina** had grain yields of more than 1.00 kg plot<sup>-1</sup> while exhibiting an acceptable lowest pod height. The seeds of these entries were increased for further testing.



Twelve selected soybean entries were planted in November 2002 in a replicated variety evaluation trial. A new variety acquired from Mexico, **Huasteca 200** was included in the trial for the first time. The seeds of this variety were acquired by the Soybean Project for commercial production in October/November 2002 through a commercial seed company in Mexico. Overall yields were low during this crop season due to low soil moisture at the critical growth period. A few entries had very low seedling emergence. The new entry, **Huasteca 200** out yielded all entries and had a yield of 1,892 kg ha<sup>-1</sup>. This entry will be further evaluated in both crop seasons.

Technical Assistance was provided to the staff of the soybean project and participating farmers through site visits, discussions and recommendations. Assistance was given in the selection of land. Based on soil analysis results fertilizer recommendations were given. During the crop production cycle recommendations were also given on the management of weeds and insect pests. A training workshop on Soybean Production was conducted on 11<sup>th</sup> April 2003 for soybean farmers in which about 25 farmers participated. A Soybean Production Manual was prepared and electronic and hard copies were submitted to the Soybean project for further distribution. CARDI's Professional staff participated in Soybean Field Day, which was held on 9<sup>th</sup> September 2003 in which over 60 farmers participated.

**Peanut:** Forty-three entries were planted in December 2002 and June 2003 in an unreplicated preliminary evaluation trial. A number of entries were found to be resistant to rust disease. Entries **WS-1** and **WS-4** were highly resistant to rust disease and entries **WS-1**, **ICGV- 88407**, - **91001B**, and **91007** were moderately resistant to leaf spot disease in both crop seasons. However, the crop had very low incidences of foliar diseases when planted in December 2002 as compared

to June 2003 planting season. A number of entries had performed better than the control entry, **Tennessee Red**.

**Cowpea:** Technical assistance was provided to a large number of farmers in cowpea production technologies, particularly in the areas of weed, insect pest and disease management. Over the years cowpea production in Belize increased from 365 ha in 1993 to 2,830 ha in 2002. Annually, Belize has exported over 90% of the crop, which generated in excess of BZ\$3 million in the year 2003. Cowpea has become an important non-traditional export crop for Belizean farmers.



*Habanero Pepper Production*

**Hot Pepper:** The Ministry of Agriculture and Fisheries provided funds for a seed blower through OIRSA for improving quality of hot pepper seeds. The blower was acquired and tested for its operation. It successfully removed higher percentages of light seed and other foreign material from the seed lots resulting in improvement in germination, vigor and overall quality of the seed. Seeds after passing through seed blower and germination test were sold to farmers. Hot pepper seed imported from CARDI Antigua were locally repackaged and sold after germination tests were conducted to confirm quality.

**Chick pea:** Twenty entries were planted in November 2002 in an unreplicated preliminary evaluation trial. These entries were acquired from FAO and were planted for the first time. Entry **FLIP 93-93C** out yielded all entries. Three entries had larger seed size. Preference in the Caribbean market was for larger seed size. These entries will be further tested. Stock seeds of 15 earlier selected entries were multiplied for the maintenance of germplasm.

**Seed Production:** Nucleus seed of selected crop types and varieties was produced on CARDI Field Station in Belmopan during November 2002 – March 2003 and Central Farm in both seasons. Basic seed production involved selected varieties of ten-crop types - chickpea, cowpea, mungbean, peanut, pigeonpea, rapeseed, rice, sesame, soybean and urid bean. Certified seeds of corn, cowpea, mungbean, peanut, and soybean were produced, cleaned and distributed to farmers.

#### **5.4.0 Inter-American Institute for Cooperation on Agriculture**

**Agricultural Health and Food Safety:** Coordination and logistic support was provided for Strengthening Agricultural Quarantine Services (SAQS) project and for hosting three activities in Belize: the establishment of a regional body to coordinate agricultural health activities, a workshop on animal pest risk analysis and disease surveillance, and a workshop for development of legislation for an animal emergency response system. Technical support was provided to the SPS focal point in development of a national action plan for compliance with WTO/SPS agreements.

Support was provided to the Belize Agricultural Health Authority (BAHA) in sourcing of consultants to provide training in the area of beekeeping and pest risk analysis as part of their staff development program. Additional staff training was also provided through the SAQS project for BAHA staff for development of quarantine procedures and protocols.

**Sustainable Rural Development:** Technical support was provided for design and construction of a cashew processing plant, sourcing cashew processing equipment from El Salvador, installation of

the equipment in Belize and training for members of the cashew producers' cooperative in operation and maintenance of the equipment. The cooperative markets roasted cashew nuts on the local market with plans for expansion to supply the export markets.

Technical training was provided to farmers and extension agents on seed multiplication and agronomic practices for cashew, plantain, banana, coco yam, cassava and pineapple in support of the agricultural diversification program of the Ministry of Agriculture. Procedures for selection and introduction of improved germplasm for cassava and management and control of black sigatoka were highlighted.

**Technology and Innovation:** IICA, as a member of the ministerial task force for institutional development, provided technical cooperation for conversion of Central Farm (the Research Department of the Ministry of Agriculture) into an autonomous institution, the Belize Institute for Agricultural Research and Development (BIARD). Draft legislation was produced for the institutional transformation. Technical assistance was provided to the biosafety committee for preparation of draft legislation on biosafety and GMO use and legislation for organic agricultural practices was completed and submitted to the relevant authorities for enactment.



Three training events were provided to extension officers and farmers on composting and other management practices in organic agriculture. The training was executed in collaboration with CATIE and national institutions that supported the establishment of the national organic agriculture program. Technical assistance and funding was provided for sourcing and introduction of earthworms (California Red and African Night Crawler) from Costa Rica as part of the technological package for the development of organic agriculture. The worms were multiplied for distribution to selected farmers.

### **5.5.0 Food & Agriculture Organization**

In 2003 the FAO- Belize programme consisted of two Technical Cooperation Programmes (TCP), six regional TCP projects and six Telefood projects. FAO's intervention was in the following areas: information management, shrimp health, medfly pest free areas, forest health, plant and animal health, legal framework for the establishment of the Belize Institute of Agriculture and Research Development and, project formulation for a fisheries development project. Belize also benefited from three other regional projects recently approved, namely, market information, CARICOM/CARIFORUM Special Project for Food Security (SPFS) and small ruminant development. The latter three projects were approved in 2003 but very little field activities were carried out. The TCP projects focused on capacity building and institutional strengthening in the various subject areas.

The TCP project **Data Collection and Analysis Project**, better known as the Belize Farm Registry (BFR), came to a close in March. This project was designed to assist the statistics unit of the Ministry of Agriculture and Fisheries to generate the necessary data and reports to assist users to take well informed decisions. FAO also assisted in a consultancy for the preparation of the legal framework for the establishment of the **Belize Institute for Agriculture Research and**

**Development**, better known as BIARD. The purpose of the legal framework was to provide the Ministry of Agriculture and Fisheries with a tool to guide itself in the establishment of the institution. From the remaining funds from the TCP FAOR facility a consultancy for a **small ruminant market study** was carried out. The report suggested that the small ruminant industry at the moment could not support an export thrust since the target markets were presently being supplied by the major ruminant producers and marketers in the world.

World Food Day 2003 was celebrated at the Union Field in the Toledo district. The theme **International Alliance Against Hunger** formed the center piece of the celebration. The celebration was conducted jointly with a food fair being organized by PAHO. The day was also filled with cultural presentations by the local school children of the district and other local artists. The Burrel Boom village in the Belize district has been selected as the venue for the 2004 World Food Day celebration.

The government of Belize through the Ministry of Agriculture and Fisheries has agreed to focus the 2004 work program on eight areas that include: Fisheries, Agriculture, Agricultural Support Systems, Forestry and Agriculture, Food Security and Trade Policy. The Prime Minister has expressed in person to the Director General of FAO his interest to seek FAO's assistance to develop a project for a school gardening and include school gardens in the primary school curriculum. The South-south Cooperation initiative between Belize and Cuba is another area that Belize wants to pursue in 2004.

#### **5.6.0 Republic of China on Taiwan (Technical Mission)**

The mission has been in operations since early 1991. The basis of the operation was agricultural while offering services in diversified areas such as: Supplementary medical service, Computer technology, Financial service and Education.

The mission was made up of eleven members, including the Chief, two agronomists, a horticulturist, a food-processing specialist, a mechanic, an assistant on internship, and four volunteers. The partner agency undertook three activities in agriculture: the Rice Project, the Vegetables /Agronomic Crops project, and the Food Processing Project. The Rice Project aimed to produce quality seeds, to transfer seed multiplication technology, and to improve production systems. The Vegetables and Agronomic Crops Project aimed to help small holder farmers improve their production and marketing capacities; the objectives of the project were to identify crops with production and marketing potential, to develop a viable production system, to transfer technology to farmers and extension officers, and to facilitate organization of farmers' group. The Food Processing Project aimed to introduce appropriate technology on food processing.

#### **5.7.0 International Regional Organization for Health in Agriculture (OIRSA)**

In 2003, the office of the International Regional Organization for Health in Agriculture (OIRSA) in Belize continued a close collaboration with the Ministry of Agriculture and Fisheries and with the Belize Agricultural Health Authority of Belize in the administration and close implementation of various agricultural projects which are summarized below:

**OIRSA/Vifinex:** The objective of this project was to strengthen the sanitary and phytosanitary surveillance in Non Traditional Export Crops. The funding source was the Republic of China

(ROC) and the amount allocated for Belize was \$550,000. US. The project started in March 1999 and was scheduled for completion by April 2004.

**OIRSA/PHMB:** The objective was to biologically control the Pink Hibiscus Mealybug from spreading to other Central American countries. The parasitoid used was *Anagyrus kamali*. The funding source from OIRSA Member countries was \$425,000. The project started in January 2000 and will be completed by December 2005.

**BID/FOMIN-OIRSA ATN/MT/7957-RG:** The objective was to contribute to the improvement of trade exchange of agricultural products in the countries of the Plan-Puebla-Panama (PPP), through the harmonization and betterment of a regional system application of sanitary and phytosanitary measures and strengthening the regional coordination of the operative agro-sanitary structure in each country. Approximately \$260,000 US was allocated for Belize from the Inter American Development Bank and OIRSA. The project started in October 2002 and is to be completed by December 2005.

**OIRSA/ PREFIP:** The objective was to conduct epidemiological surveillance to maintain the free status of Classical Swine Fever in Belize. Republic of China was the source of funding for a total of U.S \$87,103.00. The project started in July 2002 and will come to an end by December 2006.

**West Nile Virus Emergency Programme:** The objective was to strengthen an epidemiological surveillance system for the early detection and to support the diagnostic capabilities of the disease in Belize. The funding source was OIRSA member countries with a total of \$6,000. U.S. The project was implemented from September 2003 to December 2003.

**OIRSA/FAO TCP/RLA/2912:** The objective was to strengthen the entire Phytosanitary Capacity of the OIRSA member countries. The funding source was Food and Agricultural Organization (FAO) with approximately \$36,000. U.S. allocated for Belize. The project was implemented from December 2003 to August 2004.

**Technological master degree programme on sanitary and phytosanitary measures:** The objective was to provide capacity building to personnel of the Ministry of Agriculture in order to be prepared and comply with the International Standards of Sanitary and Phytosanitary Measures. The sponsoring source was OIRSA-BELIZE with \$ 15,000. US. The project was implemented in September 2003 and will end on November 2004.

**National citrus survey:** The objective was to determine the presence or absence of citrus leprosis and citrus canker diseases in Belize. The sponsoring source was OIRSA member countries with a total of \$10,000 U.S. The project was implemented in March 2003 and will end on October 2004.

## **6.0. Senior Management Staff of the Ministry**

(31<sup>st</sup> December 2003)

### **Ministry:**

Hon. Servulo Baeza, Minister of Agriculture & Fisheries

Hon. Ismael Cal, Minister of State

Mr. Sergio Garcia, Chief Executive Officer

Mrs. Cordilia Avila, Finance Officer

Mr. Jose Castellanos, Policy Analyst

Dr. Wendel Parham, Director of Citrus & Bananas

Mr. Albino Vargas, Director of Sugar

Dr. Michael Tewes, Program Coordinator

### **Departments:**

Mr. Hugh O'Brien, 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, CARD

Mr. Fred Hunter, Managing Director, BLPA

Mrs. Imani Morrison, Managing Director, CZMA

### **Assoicated Regional/ International Organizations:**

Mr. Anil Sinha, Representative, CARDI

Dr. Edwin Martinez, Acting Representative, IICA

Dr. James Tsai, Head of Technical Mission, ROC Taiwan

Mrs. Emelda Lizarraga, Representative, OIRSA

Mr. Crispin Blanco, Representative, USDA/APHIS

## Primary Agriculture Output Value 2003 at Producer's Price

<b>Economic Value of Agriculture Output 2003</b>						
Commodities	Quantity 2002	Quantity 2003	Price (BZ\$) 2002	Price (BZ\$) 2003	Value (BZ\$) 2002	Value (BZ\$) 2003
<b>Sugarcane (tonne)</b>	<b>1,150,656</b>	<b>1,073,247</b>	<b>\$ 38.08</b>	<b>\$ 41.53</b>	<b>\$43,816,980.48</b>	<b>\$44,571,947.91</b>
<b>Bananas</b>						
(40 lb boxes)	1,281,169	3,137,223	\$ 15.20	\$ 13.06	\$ 19,473,768.80	\$ 40,972,132.38
(28 lb boxes)	364,952	388,449	\$ 10.64	\$ 9.14	\$ 3,883,089.28	\$ 3,550,423.86
(33 lb boxes)	976,826	466,707	\$ 12.54	\$ 10.77	\$ 12,249,398.04	\$ 5,026,434.39
(26 lbs boxes)	37,162	221,268	\$ 9.83	\$ 8.60	\$ 365,302.46	\$ 1,902,904.80
(31 lbs boxes)	0	110,272	\$ -	\$ 5.00	\$ -	\$ 551,360.00
(28 lbs boxes other)	0	27,440	\$ -	\$ 4.70	\$ -	\$ 128,968.00
Domestic consumpt. (40 lbs/box)	394,755	543,920	\$ 3.00	\$ 3.00	\$ 1,184,265.00	\$ 1,631,760.00
<b>Banana Products (lbs)</b>	<b>110,972,206</b>	<b>186,137,485</b>			<b>\$37,155,823.58</b>	<b>\$53,763,983.43</b>
<b>Citrus</b>						
Grapefruit (80lb box)	1,230,942	1,078,137	\$ 4.74	\$ 4.58	\$ 5,834,665.08	\$ 4,937,867.46
Orange (90 lb box)	4,122,594	4,046,295	\$ 5.88	\$ 5.90	\$ 24,240,852.72	\$ 23,873,140.50
Fresh Lime Export (lbs)	126,905	274,725	\$ 0.06	\$ 0.06	\$ 7,614.30	\$ 16,483.5
Fresh Orange Export (lbs)	13,364,902	10,271,528	\$ 0.15	\$ 0.15	\$ 2,004,735.30	\$ 1,540,729.20
Fresh Grapefruit Export (lbs)	227,294	227,294	\$ 0.25	\$ 0.25	\$ 56,823.50	\$ 56,823.50
Domestic Lime Consumpt. (lbs)	309,500	437,500	\$ 0.50	\$ .50	\$ 154,750.00	\$ 218,750.00
Domestic Grapefruit Consumpt. (80 lbs/bx)	12,309	10,781	\$ 6.00	\$ 6.00	\$ 73,854.00	\$ 64,686.00
Domestic Orange Consumpt. (90 lbs/bx)	206,129	202,314	\$ 7.00	\$ 8.00	\$ 1,442,903.00	\$ 1,618,512.00
<b>Citrus Products</b>					<b>\$33,816,197.90</b>	<b>\$32,326,992.16</b>
<b>Marine Products (incl 5% for dom. Consump)</b>					<b>\$73,880,672.00</b>	<b>\$116,132,538.38</b>
Lobster	498,920	564,792	\$ 26.53	\$ 24.07	\$13,236,475.00	\$ 13,593,211.00
Conch	464,995	435,240	\$ 7.40	\$ 9.51	\$ 3,439,554.00	\$ 4,137,651.00
Shrimp	6,330,232	16,105,812	\$ 8.46	\$ 5.76	\$53,562,896.00	\$ 92,846,034.00
Whole Fish	37,539	50	\$ 3.29	\$ 8.07	\$ 123,620.00	\$ 403.50
Other		1,400		\$ 17.94	\$ -	\$ 25,118.00
Domestic Consumption	366,584	855,365	\$ 9.60	\$ 6.47	\$3,518,127.00	\$ 5,530,120.88
<b>Other</b>						
Papayas (export)	23,783,560	31,200,010	\$ 0.35	\$ 0.45	\$ 8,324,246.00	\$ 14,040,004.50
Apple Banana (Bunches)(30 lbs/bunch)	5,700	20,840	\$ 3.00	\$ 3.00	\$ 17,100.00	\$ 62,520.00

Cowpeas	8,225,356	6,902,400	\$ 0.35	\$ 0.45	\$ 2,878,874.60	\$ 3,106,080.00
Hot peppers (export)	217,906	328,454	\$ 0.80	\$ 0.80	\$ 174,324.80	\$ 262,763.20
Hot peppers (local)	228,532	251,385	\$ 1.00	\$ 1.00	\$ 228,532.00	\$ 251,385.00
Cocoa	56,131	91,200	\$ 2.00	\$ 2.00	\$ 112,262.00	\$ 182,400.00
RK beans	4,939,496	9,667,940	\$ 0.80	\$ 0.75	\$ 3,951,596.80	\$ 7,250,955.00
Black Beans	3,283,920	2,581,640	\$ .90	\$ 0.80	\$ 2,955,528.00	\$ 2,065,312.00
Other Beans	831,690	684,300	\$ 0.80	\$ 0.80	\$ 665,352.00	\$ 547,440.00
Corn	73,610,658	78,474,112	\$ 0.20	\$ 0.20	\$ 14,722,131.60	\$ 15,694,822.40
Rice paddy	24,139,125	28,113,893	\$ 0.22	\$ 0.22	\$ 5,310,607.50	\$ 6,185,056.46
Sorghum	26,651,225	20,180,400	\$ 0.17	\$ 0.14	\$ 4,530,708.25	\$ 2,825,256.00
Soybean	2,058,225	3,515,808	\$ 0.36	\$ 0.34	\$ 740,961.00	\$ 1,195,374.72
Cabbage	4,221,693	2,469,900	\$ 0.59	\$ 0.75	\$ 2,490,798.87	\$ 1,852,425.00
Cucumber	416,600	546,838	\$ 0.50	\$ 0.50	\$ 208,300.00	\$ 273,419.00
Okra	549,680	239,070	\$ 0.65	\$ 0.65	\$ 357,292.00	\$ 155,395.00
Squash	197,748	202,701	\$ 0.30	\$ 0.45	\$ 59,324.40	\$ 91,215.45
Pumpkin	733,692	493,700	\$ 0.25	\$ 0.40	\$ 183,423.00	\$ 197,480.00
Sweet Pepper	1,183,190	930,284	\$ 2.48	\$ 2.50	\$ 2,934,311.20	\$ 2,325,710.00
Tomatoes	3,154,500	2,766,660	\$ 1.14	\$ 1.00	\$ 3,596,130.00	\$ 2,766,660.00
Irish Potato	1,387,440	1,055,050	\$ 0.73	\$ 0.65	\$ 1,012,831.20	\$ 685,782.50
Onion	1,181,010	1,798,065	\$ 0.67	\$ 0.60	\$ 791,276.70	\$ 1,078,839.00
Carrots	231,584	502,886	\$ 0.71	\$ 0.60	\$ 164,424.64	\$ 301,731.60
Cassava	12,686,800	2,706,130	\$ 0.30	\$ 0.50	\$ 3,806,040.00	\$ 1,353,065.00
String Beans	20,000	20,350	\$ 0.75	\$ 0.80	\$ 15,000.00	\$ 16,280.00
Lettuce	9,000	37,438	\$ 1.50	\$ 0.75	\$ 13,500.00	\$ 28,078.50
Chinese Cabbages	229,000	308,350	\$ 0.70	\$ 0.80	\$ 160,300.00	\$ 246,680.00
Broccoli	13,675	16,950	\$ 2.50	\$ 1.50	\$ 34,187.50	\$ 25,425.00
Celery	20,000	6,500	\$ 2.50	\$ 2.00	\$ 50,000.00	\$ 13,000.00
Cho-cho	137,000	158,892	\$ 0.85	\$ 0.75	\$ 116,450.00	\$ 119,169.00
Sweet Corn (ears)	480,000	285,800	\$ .70	\$ 0.70	\$ 336,000.00	\$ 200,060.00
Cauliflower	1,900	6,000	\$ 2.50	\$ 1.50	\$ 4,750.00	\$ 9,000.00
Cocoyam	1,882,225	1,034,737	\$ 0.60	\$ 0.50	\$ 1,129,335.00	\$ 517,368.50
Sweet Potato	335,399	399,800	\$ 0.56	\$ 0.40	\$ 187,823.44	\$ 159,920.00
Yam	42,600	81,650	\$ 0.56	\$ 0.40	\$ 23,856.00	\$ 32,660.00
Yampi	30,800	101,000	\$ 0.85	\$ 0.40	\$ 26,180.00	\$ 40,400.00
Jicama	92,600	68,200	\$ 0.45	\$ 0.50	\$ 41,670.00	\$ 34,100.00
Mangoes	2,431,000	2,651,000	\$ 0.50	\$ 0.50	\$ 1,215,500.00	\$ 1,325,500.00
Local Papaya	435,780	581,258	\$ 0.53	\$ 0.53	\$ 230,963.40	\$ 308,066.74
Peanuts	306,950	181,400	\$ 1.11	\$ 1.11	\$ 340,714.50	\$ 201,354.00
Pineapple	4,208,727	3,655,287	\$ 0.63	\$ 0.35	\$ 2,651,498.01	\$ 1,279,350.45
Pitahaya	29,000	16,400	\$ 2.00	\$ 2.00	\$ 58,000.00	\$ 32,800.00
Plantain (bunches)	879,770	611,420	\$ 5.00	\$ 5.00	\$ 4,398,850.00	\$ 3,057,100.00
Watermelon	4,564,760	3,793,026	\$ 0.30	\$ 0.30	\$ 1,369,428.00	\$ 1,137,907.80
Coconuts (nuts)	3,746,522	3,075,843	\$ 0.44	\$ 0.50	\$ 1,648,469.68	\$ 1,537,921.50
Cotton	131,985	60,125	\$ 8.00	\$ 8.00	\$ 1,055,880.00	\$ 481,000.00
Cantaloupe	799,300	564,700	\$ 0.78	\$ 0.40	\$ 623,454.00	\$ 225,880.00
Annato	21,300	41,300	\$ 1.00	\$ 0.90	\$ 21,300.00	\$ 37,170.00
Coffee	500,000	502,800	\$ 1.35	\$ 1.35	\$ 675,000.00	\$ 678,780.00
Avocado	410,000	396,400	\$ 0.85	\$ 0.75	\$ 348,500.00	\$ 297,300.00

Cashew (raw nut)	300,500	240,800	\$ 1.00	\$ 1.00	\$ 300,500.00	\$ 240,800.00
Ginger	154,000	138,000	\$ 0.75	\$ 0.75	\$ 115,500.00	\$ 103,500.00
Nutmeg	400	500	\$ 10.00	\$ 15.00	\$ 4,000.00	\$ 75,000.00
Grapes	2,400	3,500	\$ 3.00	\$ 3.50	\$ 7,200.00	\$ 12,250.00
Craboo	161,000	175,000	\$ 0.40	\$ 0.75	\$ 64,400.00	\$ 131,250.00
Guava	102,000	127,400	\$ 2.00	\$ 1.50	\$ 204,000.00	\$ 191,100.00
Other Fruit (sapodilla,mamey,etc.)					\$ 125,000.00	\$ 137,500.00
Other Vegetables (radish, cilantro, etc.)					\$ 100,000.00	\$ 110,000.00
Soursop	22,800	22,025	\$ 1.00	\$ 2.00	\$ 22,800.00	\$ 44,050.00
<b>Fruits/Vegetables</b>					<b>\$77,919,286.09</b>	<b>\$ 77,708,793.82</b>
<b>Livestock:</b>						
Beef (dress weight in lbs)	4,066,048	4,896,000	\$ 2.50	\$ 2.50	\$ 10,165,120.00	\$ 12,240,000.00
Beef Export ( on the hoof) (lbs)	1,278,700	1,126,700	\$ 1.05	\$ 1.10	\$ 1,342,635.00	\$ 1,239,370.00
Pigs (dress weight in lbs)	2,148,600	2,280,360	\$ 2.50	\$ 3.00	\$ 5,371,500.00	\$ 6,841,080.00
Sheep (dress weight in lbs)	37,200	40,950	\$ 3.00	\$ 3.00	\$ 111,600.00	\$ 122,850.00
Poultry (dress weight in lbs)	30,800,751	30,048,504	\$ 1.58	\$ 1.54	\$ 48,665,186.58	\$ 46,274,696.16
Turkey (dress weight in lbs)	396,990	353,511	\$ 3.00	\$ 3.00	\$ 1,190,970.00	\$ 1,060,533.00
Milk (lbs)	7,422,148	7,584,352	\$ 0.33	\$ 0.32	\$ 2,449,308.84	\$ 2,426,992.64
Spent hens (No. Heads)	139,500	139,000	\$ 3.00	\$ 3.00	\$ 418,500.00	\$ 417,000.00
Eggs (dozen)	2,153,322	2,664,928	\$ 1.50	\$ 1.50	\$ 3,229,983.00	\$ 3,997,392.00
Honey (lbs)	104,500	117,343	\$ 4.50	\$ 4.50	\$ 470,250.00	\$ 528,043.50
<b>Livestock</b>					<b>\$73,415,053.42</b>	<b>\$ 75,147,957.30</b>
<b>All Non-traditional products</b>					<b>\$151,351,439.51</b>	<b>\$152,919,271.12</b>
<b>Citrus/Sugarcane/</b>						
<b>Bananas/Fisheries</b>					<b>\$188,669,673.96</b>	<b>\$246,795,461.88</b>
<b>Total Agri. Output</b>					<b>\$340,021,113.47</b>	<b>\$399,714,733.00</b>

Source: MAFC, District Agriculture Offices Reports

### Appendix I-A: Nominal Agriculture Exports ('000 Bz \$)

Commodities <sup>a</sup>	1999	2000	2001	2002	2003
<b><i>Sugarcane Sector:</i></b>					
Sugar (Long Ton)	\$ 86,616	\$ 74,232	\$ 59,370	\$ 65,981	\$ 73,746
Molasses (gals)	\$ 436	\$ 268	\$ 1,649	\$ 2,678	\$ 2,466
Sugar/Molasses	\$ 87,052	\$ 74,500	\$ 61,019	\$ 68,659	\$ 76,212
<b><i>Bananas</i></b>	\$ 56,834	\$ 65,816	\$ 42,804	\$ 40,990	\$ 53,763
<b><i>Citrus Sector:</i></b>					
Orange Concentrate (gal)	\$ 45,569	\$ 87,392	\$ 71,116	\$ 50,101	\$ 66,245
Orange Squash (gal)	\$ 15,731	\$ 18,791	\$ 4,584	\$ 3,642	\$ 1,793
Orange Oil (lbs)	\$ 223	\$ 240	\$ 385	\$ 751	\$ 561
Grapefruit Concentrate (gal)	\$ 9,317	\$ 7,180	\$ 17,439	\$ 13,901	\$ 12,437
Grapefruit Squash (gal)	\$ 3,172	\$ 6,086	\$ 1,946	\$ 11,294	\$ 1,969
Grapefruit Oil (lbs)	\$ -	\$ 231	\$ 94	\$ 305	\$ 24
Fresh Lime (lbs)				\$ 8	\$ 16
<b><i>Citrus</i></b>	\$ 74,012	\$ 119,920	\$ 95,564	\$ 79,994	\$ 83,045
<b><i>Marine Products</i></b>	\$ 55,566	\$ 71,679	\$ 66,566	\$ 70,363	\$ 110,602
Lobster	\$ 16,750	\$ 18,765	\$ 12,973	\$ 13,236	\$ 13,593
Conch	\$ 2,557	\$ 4,858	\$ 4,644	\$ 3,440	\$ 4,138
Shrimp	\$ 36,064	\$ 47,831	\$ 48,933	\$ 53,563	\$ 92,846
Whole Fish	\$ 96	\$ 161	\$ 0	\$ 124	\$ .404
Other	\$ 100	\$ 64	\$ 15	\$ -	\$ 25
<b><i>Traditional Sector</i></b>	\$ 273,464	\$ 331,915	\$ 265,953	\$ 260,006	\$ 322,438
<b><i>Other</i></b>					
Pepper Sauce	\$ 369	\$ 662	\$ 409	\$ 469	\$ 607
Papayas	\$ 7,464	\$ 12,754	\$ 10,283	\$ 15,879	\$ 16,608
Red Kidney Beans	\$ 3,872	\$ 2,433	\$ 3,276	\$ 2,048	\$ 1,641
Black Eye Peas	\$ 1,945	\$ 3,021	\$ 2,739	\$ 2,427	\$ 3,408
Mangoes	\$ 106	\$ 31	\$ -		\$ 1
Cocoa Beans	\$ -	\$ 116	\$ 117	\$ 29	\$ 94
Honey	\$ 41	\$ -	\$ -		0
Peanuts	\$ 13	\$ -	\$ -		0
<b>Total Other</b>	\$ 13,810	\$ 19,017	\$ 16,824	\$ 20,852	\$ 22,359
<b>Other Exc Papayas</b>	\$ 6,346	\$ 6,263	\$ 6,541	\$ 4,973	\$ 5,751
<b>Agriculture Export Earnings</b>	\$ 287,274	\$ 350,932	\$ 282,777	\$ 280,858	\$ 344,797

## Appendix I-B: Real Agriculture Exports ('000)

Commodities	1999	2000	2001	2002	2003
<b><i>Sugarcane Sector:</i></b>					
Sugar (Long Ton)	118	108	89	103	108
Molasses (gals)	5,623	5,147	4,809	5,618	5,583
Sugar Products					
<b><i>Bananas (tonne)</i></b>	56	65	48	43	75
<b><i>Citrus Sector:</i></b>					
Orange Conc. (gal)	2,904	5,170	5,875	4,037	5,274
Orange Squash (gal)	3,613	3,774	869	819	444
Orange Oil (lbs)	725	650	696	749	241
Grapefruit Conc. (gal)	846	463	1,454	949	755
Grapefruit Squash (gal)	700	1,392	439	1,719	341
Grapefruit Oil (lbs)	0	103	54	57	11
Fresh lime (lbs)				127	275
<b><i>Marine Products (lbs)</i></b>	5,682	6,351	8,268	7,332	17,107
<i>Lobster</i>	606	673	468	499	565
<i>Conch</i>	365	526	644	465	435
<i>Shrimp</i>	4,637	5,061	7,145	6,330	16,106
<i>Whole Fish</i>	65	87	10	38	24
<i>Other</i>	10	4	1	-	1
<b>Other</b>					
Pepper Sauce (lbs)	212	383	196	308	399
Papayas (lbs)	9,069	12,310	14,153	24,927	36,370
Red Kidney Beans (lbs)	5,041	4,213	5,974	3,915	3,074
Black Eye Peas (lbs)	3,572	9,238	7,537	5,455	8,130
Mangoes (lbs)	66	138	0	0	10
Cocoa Beans (lbs)	N/A	65	66	55	45
Honey (lbs)	45	N/A	N/A	N/A	N/A
Peanuts (lbs)	11	N/A	N/A	N/A	N/A