



**A Business of Details:
A “How-To” Manual for Those Interested in
Developing Agricultural and Food Exports to
Developed Markets**

by

**William Hargraves
(SPS/Food Safety Consultant)**

**Submitted by:
Chemonics International, Inc.**

**Submitted to:
Regional Center for Southern Africa,
U.S. Agency for International Development**

Gaborone, Botswana

July 2004

USAID Contract No. 690-I-00-00-00149-00



TABLE OF CONTENTS

Acronyms		i
Introduction		iii
SECTION I	Points of Contact for Market Entry	1
	A. Southern Africa	2
	B. United States	6
	D. Canada	7
	F. Europe	8
SECTION II	Finding a Business Partner	13
	A. Seven Leading Characteristics of a Good Exporter	13
	B. Judging Market Potential	14
	C. Sources of Trade Information	14
	D. Canadian Sources of Trade Information	15
SECTION III	Business Decisions and Documents	17
	A. Terms of Sale	17
	B. Letter of Credit	17
	C. Phytosanitary Certificate	18
	D. Other Documents	18
SECTION IV	Post-harvest Handling of Agricultural Commodities	19
	A. Grading and Packaging	19
	B. Meeting Product Standards	20
	C. Condition and Quality of Exports Upon Arrival	24
SECTION V	Transportation Options	27
	A. Modes	27
	B. Responsibility for Shipment Outturn	30
	C. Other Considerations	31
SECTION VI	Origin Regulations and Infrastructure: Malawi, Mozambique South Africa, Tanzania, and Zambia	33
SECTION VII	Regulatory Agencies Controlling Shipment Condition, Food Safety, and Bio-terrorism	35
	A. United States Regulatory Agencies	35
	B. Canadian Regulatory Agencies	39
	C. European Union Regulatory Agencies	41
	D. Private Sector Quality Standards	44
SECTION VIII	Organics	47
	A. International Standards	47
	B. United States Standards	47
	C. European Standards	48
	D. United Kingdom Standards	50
	E. Canadian Standards	50
	F. South African Standards	50
SECTION IX	Marketing Strategies	53
SECTION X	Hazard Analysis and Critical Control Points in Food Processing	55

SECTION XI	Target Commodities: Specific Market Requirements	59
	A. Baby Vegetables	59
	B. Grapefruit	67
	C. Melons	69
	D. Mango	70
	E. Paprika and Chili Peppers	71
SECTION XII	Customs Duties, Harmonized Tariff Code, and Special Legislation	73
ANNEX A	How to Keep Up to Date with Regulations and Market Changes	A-1
ANNEX B	Publications and Sample Forms	B-1

ACRONYMS

AMS	Agricultural Marketing Service (USDA)
APHIS	Animal and Plant Health Inspection Service (USDA)
BRC	British Retail Consortium
CA	Controlled Atmosphere
CBP	Customs and Border Protection (U.S.)
CBSA	Canadian Border Services Agency
CCA	Corporate Council for Africa
CDC	Centers for Disease Control (U.S.)
C&F	Cost and Freight
CIES	CIES — The Food Business Forum (Paris, France)
CFIA	Canadian Food Inspection Agency
CGSB	Canadian General Standards Board
CIF	Cost Insurance Freight
CODEX	Codex Alimentarius
CPMA	Canadian Produce Marketing Association
CSI	Container Security Initiative (U.S.)
EFSA	European Food Safety Authority
EPA	Environmental Protection Agency (U.S.)
EU	European Union
FAO	Food and Agriculture Organization
FAS	Free Alongside
FDA	Food and Drug Administration (U.S.)
FMI	Food Marketing Institute
FOB	Free on Board
GAP	Good Agricultural Practices
GFSI	Global Food Safety Initiative
GMO	Genetically Modified Organism
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis Critical Control Points
HS	Harmonized Tariff Product Code

ICC	International Chamber of Commerce
IFOAM	International Federation of Organic Agricultural Movements
IOAS	International Organic Accreditation Services Inc.
IPPC	International Plant Protection Convention
ISO	International Standards Organization
LD	Lower Deck
LOC	Letter of Credit
NAFTA	North American Free Trade Act
NGO	Nongovernmental Organization
OECD	Organization for Economic Cooperation and Development
OIE	Organization of Epizootics
OMAF	Ontario Ministry of Food and Agriculture (Canada)
OPIC	Overseas Private Investment Corporation
OTA	Organic Trade Association
PIMT	Produce Import Management Team (USDA APHIS)
PLU	Price Look-Up
PMA	Produce Marketing Association (US)
PMRA	Pest Management Regulatory Agency (Canada)
PRA	Pest Risk Analysis
RAPID	Regional Activity to Promote Integration through Dialogue and Policy
SADC	South African Development Conference
SCC	Standards Council of Canada
SOP	Standard Operating Procedures
SPS	Sanitary/Phytosanitary
SSOP	Sanitation Standard Operating Procedures
TBT	Technical Barriers to Trade
UFFVA	United Fresh Fruit and Vegetable Marketing Association
UKROFS	United Kingdom Register of Organic Food Standards
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USNOP	United States National Organic Program
WCO	World Customs Organization
WTO	World Trade Organization

INTRODUCTION

Many countries of the world's southern hemisphere—Chile, New Zealand, Australia, and more recently South Africa—are enjoying huge success in exporting agricultural commodities to markets in the north during their off season. Sub-Saharan Africa has this same potential to become much more active in international agricultural trade, exporting to Europe, the United States, and Canada.

Toward this end, several USAID-funded projects have identified the region's severe regulatory constraints, the economic realities of obtaining inputs, of farming efficiencies, and appropriate use of available transport. Country Reports for the five nations which are the main focus of this manual were drafted under a Chemonics International project known as RAPID (Regional Activity to Promote Integration Through Dialogue and Policy Implementation); these reports identified the regulatory and infrastructure gaps and provide concise statements of the existence of (or lack of) laws, regulations, infrastructure staffing/training needed for responsible participation in the competitive international market by the agricultural sector, including both plant and animal foods. Also included were guidelines for the public and private sectors of each country in the areas that need to be addressed in order to gain respect of the international food and agricultural trading community.

The reality of agriculture in developing countries is the existence of clusters of smallholder farmers who, acting cooperatively, can create volume necessary to justify the cost of transport from pack-house to market. The needs of these thousands of smallholders are the focus of this manual. They in turn will have to come to terms with the realities of the modern export market chain, which include:

1. Regulations in originating countries that conform to WTO standards for trade in agricultural commodities and processed food
2. Consistent enforcement of regulations at origin
3. Clear and professional communications between commodity sellers and buyers, and between regulators at the origin and at destination
4. Respect and trust between government regulators at origin and destination
5. "Partnering" between the private sector entities in the trade chain: supplier, exporter, freight forwarder, transporter, broker, importer
6. Current market intelligence, which is becoming increasingly electronic for both historic data and day-to-day changes
7. Packaging (by the supplier) that includes bar-code price stickers, eliminating time delays at destination and increasing market life
8. Use of standard international trade INCOTERMS in setting terms of sale
9. Export Agricultural and Customs requirements and procedures in use
10. Import Agricultural and Customs requirements and procedures understood and met
11. New security regulations honored at destination ports
12. Attention to quality and food safety issues: post-harvest pre-cooling and handling, cold-chain protection, protection from pathogenic contamination
13. Knowledge of organic food regulations in selected markets

14. Understanding of customs duty rates, duty-free periods, and quotas
15. A system for staying up to date in all matters pertaining to international commodity trading

These are the issues addressed, informally, in the sections that follow. Internet resources are provided in connection with many of these issues, even understanding that it is often difficult and time-consuming in Africa to access international websites. Information included here on management of organic produce quality is important because consumer demand for organically-grown produce is rapidly increasing in developed country markets. Premium retail (and, therefore, wholesale) prices can be obtained in most developed markets, making it worth the effort for organic growers to become certified.

Farm finance is a complex and fast-changing subject that will not be covered in detail in this manual. Other challenges to a healthy export sector also not addressed here include:

1. Sufficient (but not too much) water
2. Resolution of land tenure issues
3. Obtaining the correct (not old) seed in adequate quantity
4. Dependable and trained labor
5. Codifying (in writing), understanding, and observing Good Agricultural Practices
6. Good roads from fields to pack-houses so bruising and dehydration can be avoided
7. Adequate pre-cooling capacity on the premises
8. Modern holding facilities
9. Access to laboratories for sampling chemical residues, pathogens, and diseases
10. Dependable government personnel to inspect and issue phytosanitary certificates and export documents
11. Reliable transporters who understand the demands of the cold-chain for maintaining quality
12. Competitive costing
13. Availability of adequate, appropriate and efficient transport from farm
14. Quality assurance/quality control

This manual was prepared under the direction of the Southern Africa Global Competitiveness Hub in Gaborone, Botswana in accordance with an agreement between Chemonics International, Inc. and USAID/Regional Center for Southern Africa. Further overall business and technical assistance covering the full range of activities presented in this manual can be obtained by contacting www.satradehub.org.

SECTION I

Points of Contact for Market Entry

The five countries of Malawi, Mozambique, South Africa, Tanzania, and Zambia are in varying stages of being ready to responsibly export fresh commodities and processed foods. Country Reports prepared under a USAID-funded contract in 2002¹ document the extent to which regulations and infrastructure are in place to meet responsible trading requirements as expressed in World Trade Organization documents. (All five countries were grandfathered into the WTO many years ago; however, the responsibilities of WTO membership are generally being ignored until the appropriate time in the future when not fulfilling these responsibilities will matter.) The country assessments were used to derive rating scores on plant protection issues that can be useful in determining where management time and investment in infrastructure should be focused.

Every WTO member is expected to have a Contact Point for exchange of technical information and documents pertaining to: a) animal health; b) plant health; and c) human health (food safety). Each of the five subject countries listed above has fulfilled the requirement to name these Contact Points, but they are not communicating normally, lacking good electronic means (e-mail and telephones) and a common language. Responsible and consistent trade will not develop absent improved communications infrastructure.

When an exporter wants to develop a new market for his commodity, the destination country's requirements for entry of a specific commodity are made known to the exporter in the following way:

1. Exporter contacts his country's Sanitary/Phytosanitary (SPS) Enquiry Point and Technical Barriers to Trade (TBT) Enquiry Point, asking that they communicate with the destination country's SPS and TBT Enquiry Points for detailed requirements for importing the commodity.
2. When the exporter determines that those import requirements can be met, he advises his country's SPS Notification Authority to advise WTO members of his intention to begin trade of the specific commodity.
3. The notification period provides an opportunity for the entire trading community to become aware that trading has begun.

When an exporter wants to develop a new market for his fresh fruit or vegetable commodity in the U.S., an *initial* step must be taken to formally request permission to enter the destination country:

1. The exporter must submit a Petition for a Permit to Import Fresh Produce. This form can be obtained from the exporting country's ministry of agriculture, which can help complete the

¹ These evaluations and Country Reports are available from Sophia van der Bijl at svanderbijl@chemonics-rapid.org, either electronically or by hard copy.

simple details. This form is filed with the USDA-APHIS-PIMT (Produce Import Management Team), Riverdale, Maryland by the exporting country's ministry of agriculture. For Canada and the EU, the permit form can be obtained from the destination country's embassy or from the Internet.

2. The petition asks for the name and contact details of the prospective importer. This means that the exporter should have established a preliminary relationship with a trading partner in his new market. The best of several options to establish a relationship is face-to-face through trade show contact, membership in a produce marketing association, through NGOs, or through the Southern Africa Global Competitiveness Hub.
3. Details of how this petition is handled in the U.S. are contained in Section VIII, Regulatory Agencies. This is a long and complicated process that is likely to take at least two years. Handling of a petition to allow foreign fresh fruit and vegetables to enter a destination country is identical in the United States, Canada, and the European Union². The process is transparent and includes several steps that may require drafting a pest risk analysis (PRA) as allowed by WTO trading standards. The next step is a review of the PRA by a special staff of technicians, followed by site inspections, then development of mitigation procedures. Once senior-level agreement between both countries regarding pest mitigation procedures is reached, a decision is published in the Federal Register to allow a commodity to be shipped from a new production area; typically a comment period of 60 days follows, during which anyone can make a statement in favor or against the decision. Staff review comments and make a final decision for or against permission to ship, which takes effect upon publication in the Federal Register. The final regulation might be changed slightly as a result of the comments received.

It is more efficient, faster, and therefore preferred to draft PRAs using the staff of the originating country's ministry of agriculture. Technical assistance to African countries to write their own PRAs is being assigned long-term to each of the three African Trade Hubs by the USDA-APHIS. Recent insect and disease (pest) data from the growing areas is used in this work. Availability of mitigation measures is also being addressed.

At the present time (June 2004), the commodity export Contact Points in relevant countries are:

A. Southern Africa

Malawi Codex Contact Point, SPS Enquiry Point, TBT Enquiry Point
Mr. Austin S. Khulumula, Director General
Malawi Bureau of Standards
P.O.Box 946, Blantyre
Phone: 265-1-670-488
Fax: 265-1-670-756
E-mail: mbs@malawi.net
askhulumula@malawi.net

² The European Union has established offices that will eventually take over the full responsibilities of each individual member state. The effective date of this transition has not yet been determined.

**Malawi
continued**

SPS Notification Authority
 The Director of Commerce
 Ministry of Commerce and Industry
 P.O. Box 30366
 Lilongwe 3
 Tel.: 265-1-770 614/770 450
 Fax: 265-1-770 680
 E-mail: minci@malawi.net
mci@malawi.net

Mozambique

Codex Contact Point
 Mr. Evaristo Baquete
 Chefe do Departamento
 Dep. De Higiene Ambiental
 Ministerio da Saude
 P.O. Box 264
 Maputo

SPS Notification Authority
 Dr. Adolfo Paulo Mavale
 DINAP
 National Directorate of Livestock
 Ministry of Agriculture and Rural Development
 Praca dos Herois Mocambicanos
 CP 1406
 Maputo
 Tel.: 258-460 494
 Fax: 258-460 479
 E-mail: uevdinap@teledata.mz

SPS Enquiry Point
 Eng. Jose Varimelo
 Departamento de Sanidade Vegetal (Plant Health)
 Av. FGLM, recinto de INIA
 CP3658
 Maputo
 Tel.: 258-460 591/460 254
 Fax: 258-460 391
 E-mail: sanidadevegetal@tropical.co.mz

TBT Enquiry Point
 Instituto Natural de Normalizacao e Qualidade – INNOQ
 Av. 25 de Setembro, 1179-2 andar
 CP 2983
 Maputo

South Africa Codex Contact Point
Department of Health
Directorate: Food Control
Private Bag X828
0001 Pretoria
Phone: 27-12-312-0167
Fax: 27-12-326-4374
E-mail: carolv@health.gov.za
www.doh.gov.za

SPS Enquiry Point, Notification Authority
Ms. Gerda Van Dyk
National Department of Agriculture
Private Bag X250
Pretoria 0001
Tel.: 27-12-319 6120
Fax: 27-12-326 6541
E-mail: smitr@nda.agric.za

TBT Enquiry Point
South Africa Bureau of Standards (SABS)
Standards Information Center
Private Bag X191
0001 Pretoria
Tel.: 27-12-428 6002
Fax: 27-12-428 6928
E-mail: wto-info@sabs.co.za
Contact Persons: Mr. E.L. Julies
Tel.: 27-12-428 6002
Fax: 27-12-428 6751
E-mail: juliese@sabs.co.za
or Mr. P. Maclons
Tel.: 27-12-428 6022
Fax: 27-12-428 6116
E-mail: maclonsp@sabs.co.za

Tanzania Codex Contact Point
Tanzania Bureau of Standards
P.O Box 9524
Dar-es-Salaam
Phone: 255-22-2450298/255-22-245-0206
Fax: 255-22-2450959
E-mail: tbsinfo@uccmail.co.tz

SPS Notification Authority
Minister of Industry and Trade
P.O. Box 9503

Tanzania
Continued
Dar-es-Salaam
Tel.: 255-22-218 0049/218 0075
Fax: 255-22-218 3138/218 0371
E-mail: mic@raha.com
mic@interafrika.com

SPS Enquiry Point
Tanzania Bureau of Standards
P.O. Box 9524
Dar-es-Salaam
Tel.: 255-22-245 0206
Fax: 255-22-245 0959
E-mail: tbsinfo@uccmail.co.tz

TBT Enquiry Point
The Principal Secretary
Ministry of Industry and Trade
P.O. Box 9503
Dar-es-Salaam
Tel.: 255-51-117 222/5
Fax: 255-51-46919
or The Director, Tanzania Bureau of Standards
P.O. Box 9524
Dar-es-Salaam
Tel.: 255-51-450 298
Fax: 255-51-450 983

Zambia
Codex Contact Point
Minister of Health
Secretary Food and Drugs Control
P.O. Box 30205
Lusaka
Fax: 260-1-223435

SPS Notification Authority
Director of Trade
Ministry of Commerce, Trade and Industry
P.O. Box 31968
Lusaka
Tel.: 260-1-228 301/9
Fax: 260-1-226 673

SPS Enquiry Point
The Permanent Secretary
Ministry of Commerce, Trade and Industry
P.O.Box 31968, Lusaka

Zambia
Continued
TBT Enquiry Point
The Director
Box 50259
ZA 15101
Ridgeway
Lusaka
Tel/Fax: 260-1-227 171
E-mail: zabs@zamnet.zm

- a) The Permanent Secretary
Attn: Director of Trade
Ministry of Commerce, Trade and Industry
P.O.Box 31968
Lusaka
Tel.: 260-1-228 301/9
Fax: 260-1-226 673

- b) Zoo – Secretary (Animal & Animal Material)
Senior Veterinary Officer
Department of Animal Production & Health
Mulungushi House
P.O. Box 50060
Lusaka
Tel.: 260-1-250 274/252 608
Fax: 260-1-236 273

- d) Phytosanitary Service (Plant Material)
Mount Makula Research Station
Private Bag 7
Chilanga
Tel.: 260-1-278 655/278 242
Fax: 260-1-230 6222

B. United States

Codex Contact Point: Dr. F. Edward Scarbrough
Manager, U.S. Codex Office
USDA-FSIS
Room 4861 South Building
1400 Independence Avenue, S.W.
Washington, D.C. 20250

SPS Enquiry Point and Notification Authority
USDA/FAS/FSTSD
Attn: Ms. Roseanne Freeze
Room 5548 South Building
1400 Independence Avenue

Washington, D.C. 20250
Tel.: 1-202-690-1642
Fax: 1-202-720-7772
E-mail: fstd@fas.usda.gov

TBT Enquiry Point
National Center for Standards & Certification Information
National Institute for Science and Technology (NIST)
Building 820, Room 164
Gaithersburg, MD 20899
Tel.: 1-301-957-4040
Fax: 1-301-926-1559
E-mail: ncsci@nist.gov

C. Canada

Codex Contact Point
Mr. Ron B. Burke
Director, Bureau of Food Regulatory
International & Interagency Affairs Food Directorate
Health Products Food Branch
HEALTH CANADA
Room 2395, Building 7
Tunney's Pasture (0702 C1)
Ottawa K1A 0L2
Tel.: 1-613-957-1828/957-1749
Fax: 1-613-941-3537
E-mail: codex_Canada@hc-sc.qc.ca

SPS Enquiry Point and Notification Authority
Standards Council of Canada
200-270 Albert Street
Ottawa K1P 6N7
Tel.: 1-613-238-3222
Fax: 1-613-569-7808
E-mail: info@scc.ca

TBT Enquiry Point
Intergovernmental Affairs & Trade
Standards Council of Canada
200-270 Albert Street
Ottawa K1P 6N7
Tel. 1-613-238-3222 x 479/x 491
Fax: 1-613-569-7808
E-mail: info@scc.ca
Attention: Andrea Spacer, Coordinator

D. Europe

Belgium

Codex Contact Point
Comite Belge du Codex Alimentarius
Ministere des affaires etrangeres, du commerce exterior et de la cooperation au
developement
Direction generale des relations economiques et bilateraux exterioures
1000, Bruxelles
Rue des Petits Carmes, 15
Tel.: 32-02-501 8111/501 8299
Fax: 32-2-501 8827
E-mail: Charles.Cremer@health.fgov.be

SPS Enquiry Point and Notification Authority
Institut Belge de Normalisation (IBN) (Belgian Standards Institute)
Avenue de la Brabanconne 29
1040 Bruxelles
Tel.: 322-734 92 05
Fax: 322-733 42 64
E-mail: tonneaux@ibn.be
or cibelnor@ibn.be

TBT Enquiry Point
CIBELNOR
Institute Belge de Normalisation (IBN)/Belgish Institut voor Normalisatie (BIN)
Avenue de la Brabanconne, 29
1000 Bruxelles
Tel.: 32-2-295 5738
Fax: 32-2-299 5725/296b0851
E-mail: sabine.lecrenier@dg3.cec.be

France

Codex Contact Point
Comite interministerial pour les questions de cooperation economic europeenne
Secretariat General (SGCI)
Carre Austerlitz 2, boulevard Diderot 75572
Paris, Cedex 12
Tel.: 33-1-44-87 1603
Fax: 33-1-44-87 1604
or Genevieve.raoux@dqccrf.finances.gouv.fr

SPS Enquiry Point and Notification Authority
M. Olivier Prunaux
Bureau des Accords multilateraux sanitaires et phytosanitaires
Mission de Coordination sanitaire internationale
Direction generale de l'alimentation
Ministere de l'agriculture, de l'alimentation, de la peche et des affaires rurales
251 rue de Vaugirard

75732 Paris Cedex 15
Tel.: 33-1-49 55 83 95
Fax: 33-1-49 55 44 62
E-mail: Olivier.prunaux@agriculture.gouv.fr

TBT Enquiry Point
Association Francaise de Normalisation (AFNOR)
Centre d'information sur les norms et reglements techniques (CINORTECH)
Tour Europe, Cedex 07
F-92049 Paris la Defense
Attention: Mme Eveline Vezinat
Tel.: 33-1-42.91.56.69
Fax: 33-1-42.91.56.56
E-mail: eveline.vezinat@email.afno.fr

Luxembourg Codex Contact Point
Mr. M. Francois Arendt
Ingenieur-chef de division
Laboratoire national de sante
Sante, 1A rue Auguste Lumiere
Luxembourg

SPS Enquiry Point and Notification Authority
Ministere de l'agriculture, de la viticulture et du developpement Rural
SPS – Point de contact
L-2914 Luxembourg

TBT Enquiry Point
Inspection du Travail et des Mines (ITM)
26, rue Zithe
Boite Postale 27
L-2010 Luxemburg City
Tel.: 352-478 6150
Fax: 352-491 447

Netherlands Codex Contact Point
Ms. Elfriede E. E. Adriaansz
Executive Office for Codex Alimentarius
Ministry of Agriculture, Nature Management & Fisheries
Department of Food and Veterinary Affairs,
Room 4301
P.O. Box 20401
2500 EK, The Hague
Tel.: 31-70-378 4104
Fax: 31-70-378 6141
E-mail: info@codexalimentarius.nl

Netherlands SPS Enquiry Point and Notification Authority
Continued Ministry of Finance
Tax and Customs Administration
Central Licensing Office for Import and Export
Section EC/WTO Notifications
9700 RD Groningen
Tel.: 31-050 523 2133/2134/2135
Fax: 31-050 523 2159
E-mail: enquiry point2@tiscali-business.nl

TBT Enquiry Point
Minister of Finances
Central Licensing Office for Imports & Exports
Tax & Customs Administration
Section EEC/WTO – Notifications
P.O. Box 30003
9700 Rd GRONINGEN
Tel.: 31-50-5239.275/5239.178
Fax: 31-50-5239.219
E-mail: cduor@noord.bart.nl

United Kingdom Codex Contact Point
Mrs. Tutu Aluko
Food Standards Agency
Room 615C, Aviation House
125 Kingsway
London WC2B 6NH
Tel.: 44-20-7276 8164
Fax: 44-20-7276 8193
E-mail: tutu.aluko@foodstandards.qsi.gov.uk

SPS Enquiry Point and Notification Authority
Mr. Matt Sowrey
Department for Environment, Food and Rural Affairs
Room 817
9, Millbank, c/o 17 Smith Square, London SW1P 3JR
Tel.: 44-207-238 30 18
Fax: 44-207-238 30 21
Matt.sowrey@defra.gsi.gov.uk
TBT Enquiry Point
International Trade Policy Unit
Department of Trade & Industry
Room 360
Kingsgate House
66-74 Victoria Street

London SW1E 65W
Tel.: 44-171-215.45.13
Fax: 44-171-215.45.12
E-mail: anhar.meah@eirv.dti.gov.uk

**European
Union**

SPS Enquiry Point and Notification Authority
European Commission
Directorate General for Health and Consumer Protection
Directorate E, Unit E/3
International Food, Veterinary and Phytosanitary Questions
Rue Froissart 101, Room 4/74
1049 Brussels
Tel.: 322-295 5092/296 81 85
Fax: 322-299 8090
E-mail: sps@cec.eu.int
or juan.perez-lanzac@cec.eu.int
or Enrique.beltran-proveda@cec.eu.int

TBT Enquiry Point
European Commission
Directorate General for Health – Consumer Protection
Directorate E – Unit E/3
Int'l Food, Veterinary & Phytosanitary Questions
Rue Froissart 101, Room 4/74
1049 Brussels
Tel.: 322-295 5092/296 8185
Fax: 322-299 8090
E-mail: sps@cec.eu.int
or juan.perez-lanzac@cec.eu.int
or Enrique.beltran@poveda@cec.eu.int

SECTION II

Finding a Business Partner

A. Seven Leading Characteristics of a Good Exporter

A buyer and seller have to be able to plan a season's business relationship in advance so that crop size and planting schedule can be determined before purchasing inputs and lining up labor. There are many aspects to the business relationship, and from the importer's viewpoint, these export factors are key:

1. Importers seek dependable suppliers with the ability to supply grade-specific commodities at specified arrival times, in the quantities required over the duration of the shipping season. The supplier must be able to communicate by phone, fax, and/or e-mail promptly, clearly and effectively. Access to low-cost finance and working capital must be assured routinely.
2. Product quality must meet or exceed international standards. Food safety standards to ensure a pathogen and chemical-free product must be in place throughout the entire post-harvest handling period, with cold-chain protection a key factor for success. Packaging techniques must be uniform and packaging material must be state-of-the-art. Wash-water quality is a major concern to be addressed.
3. A good exporter has solved logistics issues, including good roads and transport equipment from field to pack-house, and immediate pre-cooling (product-specific) cold-chain protection from pack-house to port of exit. Smooth logistics also require adequate and dependable vehicles for highway transport, cost-efficient transport, simplified export paperwork, accuracy in paperwork completion and distribution and, hopefully, simplified intermodal movement to port of exit.
4. Exporters should agree on a method of payment — most common is the Letter of Credit, which is handled through the exporter's bank and the importer's bank. An optional method is to advance the cost of inputs (or the inputs themselves), which are then repaid by discounting the value of shipments over the duration of the shipping season.
5. The exporter must project a strong image of integrity and fair dealing. Until proven otherwise, quality from Africa is commonly assumed to be low and erratic.
6. The exporter must be willing to produce in accordance with the needs of the importer partner, including new commodities or varieties. Kiwi fruit exported from New Zealand into the U.S. is a classic example of an unknown type of fruit from a small, remote country becoming a very well accepted in a major market, sold at a price which results in good profits for all.
7. Exporters must be knowledgeable of the competitive shipping seasons for international movement of their particular commodity. Often, a window of opportunity in a given market is only 4 to 6 weeks, which is long enough to negotiate profitable arrangements with importers in a developed country.

B. Judging Market Potential

International trade entails the same basic market considerations and risks that apply to domestic or regional business. But an international trader has to do more research because of the differences in culture, consumer demands, market structure, and the political and regulatory environments in the destination market.

General economic indicators and trade statistics are important starting points for judging market potential and determining which markets to evaluate closely. Economic characteristics to evaluate include the size of the market, overall economic growth of the destination country, and buying habits of consumers there.

Trade statistics are useful indicators; however, statistics are historical in nature, and do not explain unusual events that may have distorted trade statistics in the past. Very rarely does a statistical organization attempt to forecast future trends in market growth. One company, CentradeX based in the U.S., makes such predictions based on economic forecasting from government sources. They can be reached at: CentradeX@centradeX.com

C. Sources of Trade Information

A good understanding of the marketing and distribution environment helps when choosing an importer/partner. The U.S. Department of Commerce, International Trade Administration, based in Washington, D.C., is the main government source for determining which American companies are historically involved in commodity imports. This is an impersonal way to find buyer/seller partners, but it often works well. The Office of Trade Information Services in Washington, D.C., can be reached by telephone at: 1-202-377-2432.

The Department of Commerce sometimes sends large, multi-product (mostly nonagricultural) trade delegations to a country on a one-time basis to find foreign suppliers. Some delegates are looking for joint-venture business partners in order to ensure consistent supply sources.

The Overseas Private Investment Corporation (OPIC) based in Washington, D.C. fosters private investment internationally. It is an independent U.S. government agency whose purpose is to promote economic growth in developing countries by encouraging U.S. private investment. Loan guarantee programs are available through OPIC. Other services besides investment missions are feasibility study assistance funding, survey trips for evaluating investment opportunities, and an “opportunity bank” that provides for rapid access to potential joint-venture partners.

American Business Councils exist in some countries to liaise with American companies and foreign suppliers. International banks can be a source of useful advice on potential partners in overseas markets. International accounting firms can provide in-depth country information that pertains to foreign trade. Transportation firms are also an excellent source of information on trade and market opportunities, and they can be a source of potential trade partners.

Canada and Europe organize agricultural trade delegations; each has delegations in attendance at international trade shows. Large, successful annual produce trade shows are held in the U.S., Germany, Holland, and some other countries to a lesser degree. These produce trade shows are

very important events. They are a source of informal social contact (which is essential for a trusting business relationship) and a way to judge the best out of a large field of competitors. At these expositions, it is possible to observe the product quality standards each participant is known for, to talk with others about business reputations of potential importer/partners, to meet the top management of the companies, to negotiate financing arrangements, to see the latest packaging materials in use, to learn about modified atmosphere packaging (MAP) for different produce items, to see the latest advances in machinery used in sorting/grading, packaging and pack-house handling, the use of Universal Price Codes (UPC) and the most recent developments in technology for more efficient, lower-cost operations.

Ongoing support activities are found through trade associations such as the United Fresh Fruit & Vegetable Association (UFFVA), the Produce Marketing Association (PMA), the Canadian Produce Marketing Association, and others organized in individual European countries. They provide for the interests of importers, and are the interface between private-sector producers and the national government regulatory agencies.

The Corporate Council for Africa (CCA), based in Washington, D.C. provides any services for African exporters. Matching of importer/exporter partners is one of their services. Their contact details are found in Section XIV of this manual.

Web sites for companies are commonplace now. They can be identified by searching on Google or similar Internet search engines, using a commodity name as the subject of the search. These company websites are a tremendously efficient way of gaining detailed information about potential partners in foreign trade and are an efficient tool for getting started. Ultimately a personal relationship must be developed through joint visits to the shipper's farm and the importer's place of business. At both origin and destination, it is tremendously valuable to get to know the management of the links in the distribution chain personally.

D. Canadian Sources of Trade Information

For fresh fruit and vegetables, only one organization is involved with imports issues. It is the Canadian Produce Marketing Association (CPMA), based in Ottawa, telephone: 1-613-226-4187, fax: 1-613-226-2984, e-mail: question@cpma.ca. Mr. Danny Dempster is Managing Director.

This Canadian organization has a close cooperative relationship with the U.S. Produce Marketing Association (PMA). They are completely separate organizations but have a strong business affiliation because Canada and the U.S. are each other's largest trading partner in fresh horticultural commodities.

The CPMA annual convention and trade show is an opportunity for potential African suppliers to get acquainted with the Canadian market situation and to get to know individual potential partners in trade. Canada has a very short growing and harvesting season. One hundred and twenty days is the maximum length of growing season in the southernmost farming areas, so their import season for food is much longer than in the U.S. Major suppliers of the Canadian market are Taiwan, Philippines, Japan, and China — with transit times as long as those from southern Africa to Canada. Most shipments arrive in Vancouver, British Columbia, by ocean or

airfreight carriers for transshipment by air into eastern distribution centers. The next CPMA convention and trade show is scheduled for May 11-14, 2005 in Toronto. Applications for attendance and membership can be obtained from their website:

<https://www.cpma.ca/secure/membership/joinform.html>

Over 560 international and Canadian companies representing more than 90 percent of total sales in Canada are members of CPMA. They include grower/shipper/packers, importers and exporters, food brokers, wholesalers, retailers, fresh cut and food service distributors. CPMA is the best vehicle for advising members of changes to government regulations that affect produce business in Canada.

One benefit of membership is their Market Guide, which regularly publishes market prices in Canada, the U.S., and Europe for all fruit, vegetables, herbs, and cut flowers.

SECTION III

Business Decisions and Documents

A. Terms of Sale

INCOTERMS 2000 are the globally-used terms and definitions of trade published by the International Chamber of Commerce (ICC). Uniform terms and definitions clarify for traders in all countries the ways in which title transfer to a shipment transfers from seller to buyer. Some examples are:

- **FOB - Packinghouse:** FOB means "free on board," and in this case title passes when the shipment leaves the packinghouse (or point of loading into the first transport vehicle). In this case, the buyer pays for the trucking cost from point of loading to the airport or seaport (and all costs that follow).
- **FAS - (Vessel Name):** FAS means "free alongside," and signifies that the buyer pays the origin trucking cost from packinghouse to the carrier's premises (airport or ocean terminal) with the buyer paying all receiving handling charges there and beyond.
- **C&F - Port of Destination:** C&F means "cost and freight," and the name of the port of destination is specified. In this case, the seller pays all costs to the time when the aircraft or ship arrives at the port of destination; the cost of unloading the shipment and transporting it from the unloading terminal to buyer's place of business are paid by the buyer.
- **CIF-Port of Destination:** Similar to C&F, except insurance during transit (the "I") is also paid by the shipper. Most frequently, insurance is obtained by the buyer. Since insurance for perishable commodities is costly and not commonly offered, many shipments are not insured.

Note: When shipments are not insured and there is a loss of grade or package count, the process to establish the cause of loss and to determine the responsible party is very complicated and lengthy. In these instances, payment to owner of the shipment comes months after the fact and rarely covers the full value of the product. When shipment loss or damage is insured, the insurance company pays the shipper (not necessarily the full value) and takes title to the goods, then negotiates with the carrier to settle the loss between them (usually 50-50). When this happens, the insurance company either destroys the goods or sells them to a processor.

B. Letter of Credit (LOC)

This is a document used in a banking transaction when buyer and seller are not well acquainted. Most international transactions involving agricultural commodities and food products are made using a Letter of Credit. It is originated by the buyer and describes the exact specifications of the shipment; that is, the type of goods, the quantity, the grade, the type of packaging, the label to use, the terms of sale, and the deadline date for sending the shipment.

The buyer submits this Letter of Credit to his bank, which sends it to the seller's bank. Upon receiving this document (usually electronically or by fax), the seller's bank notifies the seller of the detailed conditions that the seller must meet. These conditions must be met *exactly* or the seller's bank cannot negotiate the Letter of Credit. When the bank is assured that all conditions have been met, it sends the endorsed Letter of Credit to the buyer's bank, which treats it as a negotiable instrument (like a check) based on when title is transferred from seller to buyer. When the date of transfer has passed (as with FOB shipments), the bank immediately processes the paperwork to pay the seller. If transfer of title has not yet taken place (as in the case of C&F shipments by sea), the bank holds the LOC until the date when the paperwork is processed, assuring that all conditions of the sale have been met. Thus assured, the buyer's bank pays the seller and the shipment is released for delivery from the carrier's terminal to the buyer's premises.

C. Phytosanitary Certificate

Most countries require the originating country's ministry of agriculture to issue a phytosanitary certificate after an inspection of a shipment by a plant protection specialist. This document certifies that the shipment is free of insects and diseases (jointly known as "pests"). The signature of the specialist is a sign that the inspector's reputation as a knowledgeable and honest designee to represent the Minister. A sample document can be found in Annex A.

D. Other Documents

Documents required to export vary but most often include an export declaration or permit, and an import permit, as well as a commercial invoice. Weight certificates, packing lists, bills of lading or waybills are other documents for which requirements can change over time. Current document requirements are best obtained from a freight forwarder, who can be given responsibility for correctly completing the documents in a timely manner³. The driver of a trucked shipment must carry certain documents, and sometimes the original must be in his possession (sometimes a copy is acceptable). In all cases, the freight forwarder sends a complete set of all documents to the shipper in advance of the arrival of the shipment (being sent "overhead") in order for his customs broker to begin preparation for advance notification of the customs office at the location of shipment arrival.

Document standardization is an ongoing matter being addressed by customs and agricultural interests. Freight forwarders are obliged to send shipment details electronically to ports of loading so that ports can meet their obligation to furnish shipment details to Customs prior to loading the shipment on the vessel. These detailed requirements are still being formulated and differ slightly between Canada, the United States, and Europe. Export loading facilities must be registered and inspected, and advance notification to each shipment's country of destination is required. Requirements differ among the U.S., Canada, and Europe; they are discussed in Section VIII.

³ Freight forwarders are bonded to ensure that all declarations made in the documentation are truthful. Failure to submit honest statements in documents will subject the freight forwarder to a fine and likely loss of his business license

SECTION IV

Post-harvest Handling of Agricultural Commodities

A. Grading and Packaging

Grading. Grades are necessary — especially in international trade — so that buyers and sellers can deal with a common understanding of condition and quality of product. A buyer might want product for a top-quality market, and in that case buyer and seller know that "Grade 1" is the only acceptable grade. However, in a lower-quality market, Grade 2 or 3 — which allow for increasingly more defects in product color, shape, size, firmness, and insect damage — may be acceptable, and price at origin would be correspondingly less. (Grades of fresh produce are rather universal in nature, with very little difference between countries.) Ministries of agriculture in countries of origin should have published regulations codifying standards for agricultural commodities, available through a standards bureau. The standards bureau should also be able to access a destination country's standards for the exporter. Where there are no government-established grades, a business-to-business agreement is in order to establish the detailed standards at time of packing/shipping.

Packing. Fruit is usually graded on the packinghouse belt, which transports the commodity from field to truck into a covered, cooled facility. Fruit is usually washed there (vegetables by contrast are often not washed prior to packing.) Packinghouse belt workers make grading decisions based on commonly understood standards. One section of workers packs the highest grade, another section of workers packs the next highest grade, and the last section packs the third highest grade, with the remainder going into bulk containers for the local market or for processing into juice, sections, or the like.

Packaging. Package quality is extremely important. Shipping carton manufacturers have differing standards based mostly on the strength of the fiberboard used. Color of carton material (plain kraft or lite, for example) is as important a consideration as the design of the brand label applied to the ends of the carton.

In most developed markets, such as those in North America and Europe, the package size is controlled by regulation. Recently an international standard has become popular which specifies a 100 cm by 120 cm base pallet dimension that cartons must fit onto in an orderly pattern (the height of the carton can vary). The reason for this is the universal use of intermodal refrigerated shipping containers in produce trade by land or sea. Air containers, or "pods," can load standardized package sizes efficiently, too. Carton strength requirements are based on how many layers of product are stacked in the container or "pod" during shipment. Intermodal refrigerated containers are so tall that fourteen layers are common, even when the pallets are shipped with the packages strapped onto the pallet for stability. Because the additional strength of the carton is more costly, many shippers use two different carton strengths: one for the bottom layers, one for the top layers. Detailed carton specifications are provided below.

Labeling. An exporter label often needs to be approved by the importing country as well as the exporting country. Requirements for the wording on labels with regard to contents and size can be quite demanding. An African exporter should ask his intended importer for assistance in

getting destination-country approval of label design.

It is strongly suggested that exporters of similar commodities within a given country consider having a common brand name/label to help identify the country of origin with the product. An example of this is Capespan: markets worldwide equate Capespan with high quality from South Africa. Another example is Sunkist, a California-based cooperative of citrus growers. The Sunkist label is the brand of the product, with the name/location of the packinghouse shown in smaller letters.

In recent years, it has become common practice to establish very close exporter/importer relationships that allow the exporter to use the importer's label. This way, produce from the southern hemisphere becomes part of a year-round marketing plan of the northern hemisphere importer. Chilean grapes and tree fruit are shipped for six (winter) months of the year into markets in Japan, North America, and Europe under this kind of arrangement.

The use of PLU (price look-up) codes on individual retail packages is spreading worldwide. With the shift of consumer packaging away from the distributor into the hands of the shipper, PLU labels must be affixed at time of grading/sorting/labeling at origin. A European - African regional federation is working in cooperation with other geographic federations toward global standardization of PLU codes. The International Federation for Produce Coding is a coalition of fruit and vegetable associations that have joined together to resolve existing differences, coordinated by the Produce Marketing Association (PMA), an American organization, which serves as Secretariat for the Federation.

B. Meeting Product Standards

Sanitary and phytosanitary standards. In the years since the creation of the World Trade Organization, international standards have become more important in agricultural trade. The WTO recommends that every country involved with trade outside its own borders should follow standards that are established through a consensus of members in the Codex Alimentarius (CODEX), International Organization of Epizootics (OIE), and the International Plant Protection Convention (IPPC).

All countries in the SADC region, except the Seychelles, became members of WTO and OIE when they were established several years ago. At the present time, only Malawi, Mauritius, Seychelles, South Africa, and Zambia have IPPC membership. Tanzania, not being a member, will have a more difficult time establishing its credibility in the international community of fresh fruit and vegetable commodity traders. One of the obligations taken on through membership in these organizations is to create an office called a "Contact Point" (see Section II above). These contact points are connected electronically for the purpose of establishing a means of advising other members (potential trading partner countries) of changes in regulations pertaining to food safety and human health (CODEX), animal health (OIE), and plant health (IPPC). For this manual's readers, the IPPC is most relevant.

International and national governing authorities establish sanitary (animal health) and phytosanitary (plant health) standards, known as SPS standards, that recognize the authority of the OIE and IPPC to give guidance to member countries. There is another group of standards

known as Technical Barriers to Trade (TBT) that are mostly for non-food/agricultural, manufactured items; however, packaging and labeling matters are found in the TBT category of international standards that relate to food products and agricultural commodities as well. National standards, expressed through laws or regulations, must conform to basic internationally-agreed principles, either exactly or in equivalence.

A country wanting to export agricultural commodities must have a legal and regulatory foundation that assures importers that plant insects and diseases, and pathogens in foods, are controlled. This requires a basic food law supported by regulations allowing for the creation of a technical and administrative infrastructure sufficient to monitor performance.

Most importing countries require a Phytosanitary Certificate for horticultural commodities. This document is issued based on mutual trust between the exporting and the importing countries. It contains a signed statement saying that, through sampling, the shipment was found to be "free of pests of quarantine significance." Visual inspection commonly determines the absence of insects; laboratory analysis commonly determines the absence of diseases and pathogens. Laboratories used for phytosanitary purposes must be accredited by an international body before they can certify that a shipment is disease-free. In sub-Saharan Africa, the accrediting body is SANAS, based in Pretoria.

Industry quality standards. Basic to farming is understanding and implementation of Good Agricultural Practices (GAP). Basic principles of Good Agricultural Practices are:

1. Prevention of microbial contamination of fresh produce is favored over reliance on corrective actions taken after discovery that contamination has occurred.
2. To minimize microbial food safety hazards in fresh produce, growers or packers should use GAP in those areas over which they have a degree of control, while not increasing other risks to the food supply or the environment.
3. Anything that comes in contact with fresh produce has the potential to contaminate it; for most food-borne pathogens associated with fresh produce, the major source of contamination is associated with human or animal feces.
4. Whenever water comes in contact with fresh produce, its source and quality dictate the potential for contamination.
5. Practices using manure or bio-solid wastes should be closely managed to minimize the potential for microbial contamination of fresh produce.
6. Worker hygiene and sanitation practices during production, harvesting, sorting, grading, packing, and transport play a critical role in minimizing the potential for microbial contamination of fresh produce.
7. Follow all applicable laws and regulations (which address standards) in countries of origin as well as destination.

8. Accountability at all levels of the agricultural environment (farms, packing/sorting/grading facilities, distribution centers, and transporters) is necessary to ensure a successful food safety program. Adequately trained workers and supervisors, in sufficient numbers and specific accountabilities, ensure that all elements of the food safety program functions correctly.
9. Traceability from "farm to fork" is essential in today's environment of frequent recalls of possibly contaminated or adulterated food. Computer software is available to create internationally-accepted systems which capture details such as:
 - Names of the harvesting crew, along with time/date and the rows in the field where the produce came from
 - Time/date it arrived at the pack-house and the identification code which was assigned to the cartons in which the produce was packed
 - Time/date of loading to a named transporter along with the identification details of the vehicle
 - Arrival time/date at destination

Additional data that may be useful for historical purposes is:

- Seed date, name of source, variety and where planted, recorded by seed company tracking codes
- Names and dates of planting crew
- Names and date of production crews for fertilizing, tilling and the like
- Names and dates of visitors entering the fields, including government inspectors

At some time in the future, if there is an agro-terrorism attack somewhere in the world, such records will be required.

Environmental, social, and human rights standards. Increasingly in recent years, environmental, social and human rights issues related to the farming industry are being recognized. There are additional requirements, such as EUREPGAP, which resulted from food scares in Europe that created a demand to know much more about the origin conditions of fresh produce and cut flowers. Audits of farm performance in the context of social values are conducted by third parties; governments and leading universities can furnish the details on this trend.

Food safety standards. These standards are established by CODEX to control the spread of pathogens and diseases through commerce in food products and agricultural commodities. They include more common pathogens, such as: e.coli, listeria, salmonella, campylobacter, and diseases which can be food-borne. Good Manufacturing Practices (GMP) and Hazard Analysis Critical Control Points (HACCP) plans are respected universally as the most useful tools for eliminating the risks inherent in some types of food.

Good Manufacturing Practices (GMP) assure that food for human consumption is safe and has been prepared, packed, and held under sanitary conditions. GMPs are not mandatory in the field

or pack-house but they are common sense and are recommended for all produce handling facilities. In the European Union, United States, and Canada, GMPs are supported by laws and regulations that cover the cleanliness of personnel, buildings, facilities, and equipment; address process and production controls; and describe the level of defect that makes a product unacceptable. The current GMP for food processors in the U.S. are found in the Federal Register, 21 Code of Federal Regulations, Sections 100-169, and can be ordered through the U.S. Government Printing Office (any American Embassy Commercial Section can assist in obtaining this).

Hazard Analysis and Critical Control Points is a more recent device for preventing identified hazards in food preparation through careful control of the process. It functions as the final stage of an integrated food safety program that includes Good Agricultural Practices, Good Manufacturing Practices, and Sanitation Standard Operating Procedures (SSOP) — all of which must be in place in order for HACCP to be a practical process. There is no fixed number of critical control points in an operation. There can be as few as two CCPs in a good HACCP plan. There is no uniform HACCP plan for companies in a common industry. Each company's management prepares their own HACCP plan based on their unique situation.

Organic standards. Organically-grown fruit and vegetables have become increasingly popular, especially in European markets and to a lesser extent in the U.S. and Canada. Consumers are willing to pay more in order to be assured that product has been grown using fewer and more natural chemicals and fertilizers. Familiarity with the organizations that set the standards for production and processing of organics is essential. The International Federation of Organic Agriculture Movements (IFOAM) has articulated standards that are largely incorporated at the national level for agricultural commodities and for processed food. Their accreditation body is known as International Organic Accreditation Services Inc. (IOAS), and audits are performed by third-party, IOAS-accredited certifying bodies. The European Union has a Statutory Law on Organic Food Labeling for agricultural commodities and for processed food. In the U.S. there is a national organic program established by the USDA with accreditation authority. In Canada, organics are not yet regulated by the government.

Temperature management. Even if all the issues covered in this section are addressed satisfactorily, if there is a failure in protecting the cold-chain, a shipment will not be acceptable upon arrival at destination. When there is a temperature management failure, it is usually detected at the port of destination by the quality control management personnel at the ocean terminal.

Protecting the cold-chain begins at harvest. Temperature management is so important an issue that everything — even the simplest techniques — must become normal procedure. One important consideration is to harvest the crop at the coolest part of the day: early in the morning. Harvested crops must be transported to the pack-house or cooling facility as fast as reasonable. The harvested crop should not be exposed to the direct rays of the sun while awaiting transport or during transport. For quality control purposes, random product pulp temperatures should be taken at time of harvest and upon arrival at the pack-house or cooler.

More frequent transports of smaller quantities from the field can shorten the time between harvest and cooling. The product should be covered during transport to pack-house or cooler to

prevent direct air movement across the product — this significantly reduces moisture loss from the product. Each hour of exposure to warm, dry air is equal to more than twice the water loss from holding in humidified storage. A two-hour delay in getting the field heat out of the product is the equivalent of two weeks of market life under refrigerated transport. Heat transfer curves developed by researchers show a significant fact: that product in the field at 25 degrees C (77 degrees F) and 30 percent relative humidity (RH) loses 36 times more water than it does when cooled and in storage at 0 degrees C (32 degrees F) and 90 percent relative humidity. Dehydrated product will not sell in retail or food service outlets. Moisture lost during this phase cannot be replaced.

The pack-house receiving area must also be covered. The packing lines must be designed to handle the volume of product arriving from the field so there is no backlog of product awaiting packing. Air movement inside the pack-house should also be a concern. Evaporative cooling or mechanical air-cooling in the pack-house is best. Area temperatures should be maintained below 20 degrees C (68 degrees F). Start pre-cooling cycles immediately upon placing the first packages in the cooler. This standard is to be used for truck and intermodal container shipments. For air shipments, where control of air temperature may be at a higher-than-ideal level, pre-cooling must be adjusted to a higher level in order to prevent the cycles of down-up-down exposure to temperature-controlled air. The warming up of pre-cooled product during transit followed by the return to ideal temperature is very damaging to the product and market life will be greatly reduced.

Use of truck dock seals will minimize loss of refrigerated air from pre-cooled trucks and containers by preventing ambient air from being introduced.

Packaging and carton design is a major consideration in maintaining the cold-chain. The placement of vent holes and their size and number is very important: a minimum of five percent of carton surface should be vent holes. Loading patterns in transit vehicles determines the placement of the vent holes: in the direction of air-flow to ensure maximum cooling potential.

Intermodal containers are designed to protect 90 percent relative humidity during transit; during air transport, humidity inside cargo spaces can vary considerably. One should discuss humidity as well as temperature management issues with the air carrier.

C. Condition and Quality of Exports upon Arrival

Even with the best exporters, bad shipment outturns can occasionally happen. Although everyone involved may have tried to do everything right to ensure a good arrival at destination, unpredictable things can happen which result in a partial or total loss of product. The most common causes of deterioration of living produce or cut flowers are:

1. Inadequate precooling immediately following harvesting
2. Inadequate grading/sorting of commodity
3. Breakdown in temperature management during transit
4. Lack of fresh air exchange in container
5. Delays during transit which result in too little remaining product market life
6. Delay in delivery of shipment to final delivery point or consumer

Some of these causes are shipper-related; some are carrier-related. What is the expected procedure when a loss is found upon delivery?

1. Immediately notify the delivery carrier of the loss and ask for an independent survey
2. Immediately notify the shipper of the goods
3. Take pictures of the damaged goods
4. Separate the damaged portion of the shipment from the good portion
5. Sell the good portion of the shipment to minimize loss
6. Advise shipper of survey report and value of loss
7. File a report with marine insurance company
8. Destroy the damaged goods (business ethics are violated if damaged, labeled goods are sold)
9. File a claim with Customs for refund of duty covering unsaleable goods

In cases of a major (total) loss, it is likely that the government agricultural inspector at the port of arrival would be the one to detect the damage, especially if the refrigeration unit failed to work during transit. In that case, the survey would be carried out at the port terminal, with the government agency controlling events. When a major loss is detected at the carrier's terminal prior to the release of the shipment by customs, disposition of the damaged goods is ordered by customs upon consulting with the importer. In case of the damage resulting in a condition called "unfit for human consumption," there are usually three options offered to the owner of the goods: 1) return to shipper; 2) destroy under customs supervision; or 3) sell at a discounted price and reship to a country with less stringent entry condition requirements. The second option is usually the most economic.

When an ocean shipment is insured — called "marine insurance" — there are very specific rules defining when coverage begins and when it ends, and these parameters should be thoroughly understood before purchasing coverage. Marine insurance is expensive and only a few underwriters offer it. Unless an exporter has a known track record of good performance, the risk is high and so is the cost of the insurance premium until a track record is established over several shipments or an entire season. Marine insurance against total losses results in the insurance company taking title to the goods upon accepting proof of loss. Disposal of the shipment is determined between the insurance company and Customs, with neither shipper nor importer having influence over disposal determination.

Rejection insurance is a way for the shipper to protect against financial loss in case of transport failures. It, too, is expensive, with the cost of the premium determined partly by the reputation of the carrier being used.

Quality disputes can be very difficult to settle. To avoid disputes, the initial agreement between seller and buyer must be very detailed and specific regarding the condition (grade) requirements and quality expectations. The agreement must be in writing, not verbal. Disputes over the arrival condition or quality are usually too minor to involve attorneys. International disputes are typically resolved in favor of the importer. In such cases, unless marine insurance (which has a deductible amount) is involved the seller is at the mercy of the buyer. Close-up photographs of the product in its packaging are quite helpful in deciding the outcome of a dispute.

SECTION V

Transportation Options

One of the most important factors determining whether perishable exports arrive in good condition is transportation to market. Good roads from the field to the pack-house, and from the pack-house to ports of exit are very important, as are responsible, knowledgeable transport companies (freight forwarders usually know the fastest and most reliable companies for road, ocean and air transport). Factors to consider in deciding mode of transport are:

1. Market life of the product
2. Time demands of the buyer
3. Capability to extend market life through use of controlled atmosphere technology
4. Projected timing of arrival of similar product from other sources

Exporters have ready access to sources describing important marketing details such as normal expected market life following harvesting; ideal conditions during transport, such as humidity requirements and the use of fresh air exchange controls; use of controlled atmosphere to extend market life; thermostat setting; and other details that maximize the quality of product at time of unloading. These sources are available through leading steamship lines specializing in refrigerated transport, and through freight forwarders.

A. Modes

Airfreight. Most export commodities must be airfreighted to their destinations in order to have enough remaining market life (market life is of equal importance to landed price). Consumers are very sophisticated in this matter: whether they are in Rotterdam, Paris, London, Dubai, or Moscow, they will buy the best quality in the market. When unsold produce begins to show signs of deterioration, it is thrown out, not sold at a discounted price.

Shipping by airfreight presents some unique challenges, such as temperature control. Cargo spaces on aircraft are not temperature-controlled at the setting that is best for an export commodity. Rather, the cargo space is either not controlled at all (smaller, older aircraft) or is controlled at the same temperature as the passenger compartments. Neither is ideal for protecting product quality. Produce and cut flowers are carried at either the 8-12 degrees C range or the 0-4 degrees C range. An exporter who knows what environment to expect during transit to market will pre-cool to a level which will prevent down/up temperature shocks, but will insist on placing the shipment into coolers under the appropriate temperature controls at both the origin staging facility and at destination immediately upon unloading the aircraft.

Airfreight is the choice when: 1) shipping quantities are small; 2) when fast transit is needed; and 3) when the total costs of the movement from pack-house are less than total costs for intermodal (land/sea) shipments (especially true when the origination point is not economically accessible to a sea port).

Airfreight options are to schedule flights by passenger or cargo carriers, or to specially arrange

flights by charter airlines. Either way, shipments can be palletized or hand-stacked into an airline cargo container (called "pod"). The designations of airline cargo containers describe size and stowage location, with "LD" meaning lower deck of a double-deck type aircraft: LD3, LD7/9, or LD5/11. Some are insulated; some provide self-contained refrigeration capability.

Specifications are:

LD3: maximum cargo weight 1400 kg

Dry ice capacity 56 kg

Internal measure 1460 mm length by 1430 mm width by 1411 mm height

Useable volume 3.5 cum

Used in aircraft types 747, L1011, A300, DC10, A310, 767

LD 7/9: maximum cargo weight 5450 kg

Dry ice capacity 91 kg

Internal measure 2940 mm length by 2020 mm width by 1430 mm height

Useable volume 8.6 cum

Used in aircraft type 747, L1011, DC10, 707 and DC8 freighters

LD5/11: maximum cargo weight 3200 kg

Dry ice capacity 56 kg

Internal measure 2940 mm length by 1430 mm width by 1430 mm height

Useable volume 6.0 cum

Used in aircraft type 747, L1011, DC10

An insulated version of the LD3 is commonly in use with specifications of:

Maximum cargo weight 1400 kg

Internal measure 1523 mm length by 1562 mm width by 1620 mm height

Useable volume 3.7 cum

Used in aircraft type 747, L1011, DC10, A300, A310, 767

Air cargo pallets are used in place of containers when cargo is loaded into the main deck of the aircraft. There are too many pallet sizes to list here. Freight forwarders can provide weight and measure limits for specific flights and aircraft on an as-needed basis. The pallets are used by airport loading crews and do not leave the air terminals. This is true also for air cargo containers, although there are some instances when they are moved to the shipper's point of cargo loading.

Insulating blankets are another device to protect perishables from wide temperature swings. Reducing the shock of breaks in the cold-chain when using airfreight carriers is the single largest challenge to maintaining quality of produce and cut flowers. Blankets might help in some instances, but they could contribute to the problem if use prevents air circulation around the product to remove heat buildup. An important principle in determining a course of action to minimize the adverse effects of breaks in the cold-chain is that *heat moves but cold does not*. One source of insulating blankets is: Cool Guard Division, IFC Company, 1011 Walnut Avenue, Pomona, California, phone 1-909-517-1080, fax 1-909-517-1085.

C, D, and E containers for air cargo shipments are large bin-type corrugated containers designed to fit on a standard 100 by 120 cm pallet and can hold several hundred pounds of product. A discounted cargo rate can be expected when one is used.

Seafreight. When shipping by seafreight, source-loading (at exporter's packinghouse) using an intermodal refrigerated (reefer) container should be arranged. This method is already common among many exporters in South Africa and Namibia, using Cape Town or Durban as a port of loading. Steamship lines operating intermodal containers are motivated to promote the development of intermodal reefer shipments since the packages are handled only once at origin and once at destination, allowing for arrival in perfect condition. Sea freight is the least costly option on a per-kilo basis

Intermodal. In developed countries, door-to-door movement of fresh perishable commodities in intermodal refrigerated shipping containers owned by steamship companies is common. In southern Africa, the leading steamship companies can arrange for the positioning of a pre-tripped, refrigerated, intermodal shipping container at the shipper's pack-house by a highway hauler. The cost savings by eliminating re-handling of the packages at the port is significant. Also significant is reduction in the amount of damaged product that is inherent in re-handling. Because these intermodal shipping containers can be used as the delivery vehicle, there is only one carton handling at origin and only one carton handling at destination — the most efficient of all options. An inland highway and railroad intermodal infrastructure is being developed gradually, as needed, by the leading steamship companies serving southern Africa.

At destination, it is common for the importer to engage a local trucker to move the ocean carriers' intermodal reefer container to his point of sale (auction, food service warehouse, retail supermarket). The intermodal reefer containers can be plugged into electrical sources not only aboard ship but also at all land terminals, so temperature management is continuous while awaiting Customs clearance and importer pickup.

There are many thousands of intermodal refrigerated shipping containers in use on container ships that have hundreds of electrical power plugs for maintaining consistent temperatures during transit. The container refrigeration units themselves are microprocessor controlled for extreme accuracy in maintaining temperature, they have humidity controls for the full range of product humidity needs (60-95 percent), uniform air distribution throughout the interior space, and the capability of providing controlled atmosphere (CA): lowered oxygen in the interior space which slows the rate of ripening.

While on the highway or railcar, the refrigeration unit is powered by a generator (called "genset") that has 100 hours of operating capacity. They are sufficiently powerful and reliable to maintain temperatures accurately.

Container specifications are provided below to help a potential exporter with his or her planning.

An **intermodal high-cube refrigerated container** has interior dimensions of:

Length: 11.755 m

Width: 2.286 m

Height: 2.491 m

Structurally, maximum shipment weight cannot exceed 28,180 kg, with highway maximum legal weight limits being somewhat less than that weight. Actual weight of packaged fresh fruit and vegetables or cut flowers will not reach that capacity but can be limited by highway maximum legal weight limits. Most importers want to receive shipments on pallets, commonly the standard 100 cm x 120 cm dimensions. Twenty of these pallets fit into an intermodal high-cube refrigerated container. A high-cube container is 0.300 m taller than a standard container, which allows for an additional two layers of cartons to be loaded, so long as the carton strength is adequate to prevent collapsing. A collapsed carton will often damage the product inside, and even if it did not, in the marketplace a damaged carton is perceived as having damaged the product regardless.

B. Responsibility for Shipment Outturn

Responsibilities for high-quality outturn of shipments are shared. It is the steamship line's responsibility to position a mechanically-sound, clean, pre-cooled container at the shipper's premises on the right day at the agreed-upon time. The pack-house management is responsible for making a visual quality assurance inspection of the refrigerated container prior to loading his shipment and to ensure that the thermostat is set at the specified temperature. The pack-house management is also responsible for ensuring that the shipment has been prepared for loading using the cartons that are specified by the buyer, with design strength adequate to stack them 2.2 m high, secured and stable on pallets. A reefer container quality assurance checklist is provided in Annex B, showing in detail the specific steps each party should take.

Mixed commodities in a container are discouraged unless they are compatible in terms of carrying temperature, ethylene sensitivity, and relative humidity needs. Sufficient research has been done on all common commodities to provide compatibility charts for shippers. Most in use is one prepared by the University of California at Davis called the "Compatibility Chart for Fruits and Vegetables and Short-term Transport or Storage." A copy of this chart is found in Annex B.

Ocean terminal management is responsible for plugging the refrigeration unit into a shore-side power source and for monitoring its performance at the specified thermostat setting while waiting to load onto the ship.

Ocean carrier responsibilities during transit involve monitoring of refrigeration unit performance at the specified thermostat setting.

At the port of discharge, the ocean terminal management performs visual and record checks to ensure the protection of the shipment at the highest level, awaiting customs clearance and delivery to the importer's trucker. Every effort is made to encourage a store-to-door delivery as directed by the importer through his customs broker.

C. Other Considerations

Transit times from port of loading to port of destination vary by steamship line. Out of southern Africa, some have express service to Europe, the United States, and Canada, but some have too many port calls en route. Freight forwarders can help to sort out which carrier is best for a shipper's particular needs.

When moving goods regionally on highways, refrigerated trucks are the most common shipment option. Arrangements can be made for delicate commodities, such as easily-bruised grapes moving from Namibian and South African origins to Cape Town, to be moved over the highway using intermodal equipment rather than truck trailers.

Railroad transport is usually too slow for movement of perishable commodities, although it is an option for non-refrigerated, low-value agricultural commodities.

Selecting a good freight forwarder is essential to success in the export of perishable commodities. An experienced freight forwarder will share experience from years of success with novice exporters. They have first-hand knowledge of carriers' expertise, they know the character and peculiar requirements of markets, and can provide estimates of costs, comparing the optional methods and ports of exit.

Sometimes food brokers are helpful in identifying requirements of overseas markets. They would not be useful when an exporter/importer partnership is strong since the food broker's requirements duplicate the importer's. A customs broker is needed only for clearing imports through customs: customs brokers perform mirror-image functions to the freight forwarders' for exported goods.

The freight forwarder can help the exporter with a cost analysis of several transport options. In order to determine the full cost per kilo to the point of delivery, several cost factors must be identified and totaled. Normal cost factors are:

1. Labor cost for loading shipment into vehicle at pack-house
2. Trucking cost from pack-house to airport or seaport terminal
3. Terminal unloading charges
4. Labor cost for loading shipment into a transport container
5. Transport cost if loading is done outside the port terminal
6. Warehouse in/out charges, if loading is done outside terminal
7. Terminal handling charges to shipside
8. Ocean freight rate
9. Ocean freight surcharges, if any, for fuel or currency adjustment
10. Freight forwarder charges

Depending on terms of sale, either FOB-Pack-house or Port of Loading, or FAS, or C&F-Destination Port, some or all of these costs will be paid by exporter or receiver (see Section IV for definitions of trade terms).

SECTION VI

Origin Regulations and Infrastructure: Malawi, Mozambique, South Africa, Tanzania and Zambia

Malawi, Mozambique, South Africa, Tanzania and Zambia were surveyed in 2002 for laws, regulations, directives, and policy statements that enable free trade with other countries within recommended guidelines of the World Trade Organization (WTO). Country reports were prepared for each nation that identify gaps in regulatory regimes. Each country was rated on a scale of 1 to 5 for ease of determining where and how serious deficiencies are, making it possible to prioritize actions to be taken and to allocate assistance resources. These assessment reports are available through the Southern Africa Global Competitiveness Hub in Gaborone, Botswana.

Recommendations for a food safety program for the SADC region were provided as a supplement to the country reports, with suggestions on how to implement a food safety program at the country level. A model Food Safety Act was also contained in the supplement. Each country is advised to review all the available survey material in order to design a road map to becoming qualified to export raw agricultural commodities and processed food products. Export qualification will generate hard currency and raise standards of living. The SADC Parliamentary Forum, based in Windhoek, has reviewed the survey material and supplemental recommendations, and is well-versed in its content.

National Food Authorities. With few exceptions, countries within the SADC trade bloc have not yet established national food authorities, which would give creation of a responsible trading climate in agricultural commodities and food products high priority. Components now missing from the regulatory chain will have to be added, particularly those needed to coordinate trade bloc efforts and facilitate international communication.

Uniform Food Standards. With the Codex Alimentarius, the OIE, and the IPPC guidelines as a basis, food standards that conform to those of the leading trade blocs (NAFTA, EU) would be made into law (a Basic Food Law) supported by regulations and directives to enable dialogue on an equal footing.

Enforcement of Food Safety Measures. Food safety measures include effective enforcement measures such as inspections, sampling programs, and support for laboratory development and accreditation to certify shipments as free from insects and diseases at origin. Methods and procedures can differ between laboratories. With assistance from accrediting authorities such as SANAS, these differences can be identified and resolved.

Dissemination of Information, Training, and Public Education. Provisions for gathering and disseminating information to the public and private sector are key components of a responsible food safety initiative. Likewise, staff training is essential to ensure an energetic and aggressive team effort to trade internationally on an equal footing and to reduce the number of illnesses and death caused by bad safety practices in the domestic "farm-to-fork" movement of food products and agricultural commodities.

Additional assistance in establishing and monitoring food safety programs is available from the World Health Organization (WHO) and from the World Trade Association (WTO), Codex Alimentarius (CODEX), Food and Agricultural Organization (FAO), International Organization of Epizootics (OIE), and International Plant Protection Convention (IPPC). Aid organizations such as USAID, SIDA (Sweden), DIFD (United Kingdom), GTZ (Germany) and Canada Aid offer programs for assistance. Another source of education and training is the USDA's Cochran Fellowship program which sponsors short-term individual training at relevant American institutions. Most developed countries offer scholarships for higher education, an example of which is the international program of Tuskegee University in America.

Some contact details for these organizations are:

WHO	http://www.who.org/
WTO	http://www.wto.org
CODEX	http://www.codexalimentarius.net/
FAO	http://www.fao.org/
OIE	http://www.oie.int/
IPPC	http://www.fao.org/waicent/FaoInfo/Agricult/AGP/AGPP/PQ/default.htm

Where should food safety authority be positioned in national government? Consensus of those working on the assessments and support materials in southern African nations believe strongly that it must be separate from the traditional ministerial organization. It should report to a high level-official — either the president, his deputy, or a vice president — and should not consist of more than a secretariat of three people, drawing on the expertise, as needed, within existing ministries.

Ideally, food safety responsibilities are largely to protect human health, therefore the ministry of health is should be involved. Since failures causing human illness are agricultural in nature, the ministry of agriculture is involved. The beneficiary of the food safety activities in government is the ministry of trade. The keeper of records and regulations for public access is the standards bureau. The organization of smallholder farmers into associations is encouraged and their representation in the highest levels of a Food Safety Authority is mandatory.

Government representatives who regularly attend international meetings relevant to food safety must share their knowledge of current events and developments with those who need to know through the vehicle of the food safety authority. Similarly, large grower firms must be encouraged to play a leadership role in support of the Food Safety Authority.

SECTION VII

Regulatory Agencies Controlling Shipment Condition, Food Safety, and Bioterrorism

The concept of a country having a single food safety agency is relatively new. Lead trading countries such as Canada, members of the European Community, Japan, Australia and New Zealand have created a single agency to regulate such matters as food safety and quality controls for food products and agricultural commodities during post-harvest handling, in storage and in transport.

A. United States Regulatory Agencies

In the United States, a National Food Safety System describes the shared responsibility among the Food and Drug Administration (FDA), the Department of Agriculture (USDA), the Environmental Protection Agency (EPA), the Centers for Disease Control (CDC), and Customs and Border Protection Agency (CBP) that is now part of the Homeland Security Department. This shared responsibility can be confusing. The gateway to federal government food safety information is: www.FoodSafety.gov.

Generally, the sharing of responsibility is this:

USDA-APHIS. In order to export horticultural commodities into the U.S., an exporter needs a permit from the USDA-APHIS (Animal and Plant Health Inspection Service). The form (PPQ 587) can be downloaded from the USDA-APHIS website, or is available through a USAID mission or the USDA-APHIS office in Pretoria, phone 27-12-431-4711 extension 4709. The application process begins with the grower, who provides details to the country of origin's ministry of agriculture such as the scientific names of the products to be exported, applicant's business details, and the contact in the U.S. who can provide supplemental details. This U.S. contact is normally the proposed importer. Therefore, from the very beginning, it is essential that an exporter and the importer/partner establish an affiliation that will take them through the approval process.

This Application for Permit to Import Plants or Plant Products is submitted by the originating ministry of agriculture to the USDA-APHIS Permit (PIMT) Unit in Riverdale, Maryland (at the address printed on the form). That office will respond by acknowledging receipt of the application, advising under what conditions the plant products under consideration will be allowed entry into the United States.

If the production area is one on which USDA-APHIS has recent insect and disease data, and the findings are negligible or mitigation methods are available, entry is possible. However, if the production area is one on which USDA-APHIS does not have recent insect and disease data, a pest risk assessment may be requested. This scientific approach to trade in agricultural commodities is in accordance with WTO recommendations. A pest risk assessment can be made in a few months if sufficiently trained staff and sufficient data are available to complete the task. If that is not the case, the time needed to prepare a complete document can take one to three

years. The USDA-APHIS assists African countries by making PRA experts available to assist the country assessment-writing team. Upon completion of the draft PRA, it is submitted to the USADA Center for Plant Health Science and Technology in Raleigh, North Carolina where expert reviewers are based. PRAs submitted by African countries will be reviewed by a special team. USDA expert assistance in support of the identification of pest risks in commodity production areas are available upon formal written request by ministries of agriculture to the USDA- APHIS, copied to the Southern Africa Global Competitiveness Hub in Gabarone, Botswana.

Following finalization of the scientific portion (the acceptance of the PRA) mitigation measures are determined between the two national governments. At that point the regulation-writing (rulemaking) steps begin. The rulemaking process begins with public notice that a comment period is beginning, usually of 60 days. The daily Federal Register is the published medium used by the government for announcing intended regulation changes.

At this point it is appropriate for all who are in favor of allowing the commodity to enter the U.S. to write strong position statements to the USDA. All public comments both positive and negative are taken under consideration by USDA staff, and minor changes are often made to accommodate legitimate concerns when the final regulation is published. In addition to the public other national government departments are invited to comment. It can take several months to two years from the time notice of an intent to allow entry of a new commodity is made until the final regulation is published. In the interest of fairness and transparency all correspondence on this matter is public, with the entire file of public comments being available for review. A stakeholder database has been created for use in tracking progress of an application through the permit system. Interested parties can register their names and addresses electronically and receive information as a stakeholder. Alternatively, pest risk enquiries can be checked via web site at: <http://www.aphis.usda.gov/ppq>.

When it is determined that a pest risk assessment must be done, the applicant is asked to submit a current list of pests (insects and diseases) known to be prevalent in the production area along with the name of the institution preparing this list. The list must include:

1. Location of production area described by geographic features such as rivers or hills, or by meets and bounds
2. Name of exporting company
3. Name of pack-house
4. Port of exit
5. Export season
6. Complete address of national plant protection organization at origin with phone/fax/e-mail address
7. Complete address of research institution/organization that ensures phytosanitary security
8. List of pests (insects and diseases) associated with species:
 - scientific name
 - common name
 - plant part attacked

- period of attack
- control methods
- efficacy of control methods
- economic losses associated with pests of concern
- insect biology or disease etiology/epidemiology
- system of survey and monitoring and by whom
- control programs and by whom
- systems for pest risk mitigation and by whom (quarantine treatment, pest-free areas, systems approach)
- bibliographic references

This must be accompanied by a certification statement, clearly detailing the following:

1. Name, address, and contact details of person submitting the report
2. Signature
3. Signature date
4. Tracking number, if one has been assigned by APHIS
5. Certification: "The information submitted is true and accurate based on the best knowledge of the submitter."

Send the above-listed details to: Risk Assessments Branch Chief, Permits and Risk Assessments, PPQ, APHIS, 4700 River Road, Unit 133, Riverdale, Maryland 20737-1236.

Pest risk assessments should be prepared in accordance with the guidelines in "PPQ Guidelines for Pathway-Initiated Pest Risk Assessments," version 5.0 which is found on the website: <http://www.aphis.usda.gov/ppq/pracommodity>. Those who are preparing pest risk analyses are urged to contact the Risk Assessment Office prior to commencing work, in order to assure that they have the latest and complete information. That office can be reached at 1-301-734-8896.

The use of HACCP plans for meat and poultry processing plants was authorized in 1998.

USDA-Agricultural Marketing Service. The Agricultural Marketing Service agency in the USDA is responsible for managing the new U.S. National Organics Program (see Section IX for organics regulation).

Environmental Protection Agency. The Environmental Protection Agency sets limits on how much pesticide residue can remain on food, commonly called "tolerances." The FDA manages tolerances for the EPA.

Food and Drug Administration. The Food and Drug Administration regulates microbial food safety hazards for fresh fruit and vegetables. (Most meat and poultry shipments are regulated by the USDA.) It has new authority to protect the food supply under the Public Health Security and Bioterrorism Preparedness and Response Act of 2002. FDA controls are designed to reduce microbial hazards that can be influenced by water, manure, worker hygiene, sanitation facilities, field sanitation, pack-house sanitation and transport vehicles. A leading responsibility is to maintain registration of food facilities and manage a system of prior notice of arrival for

imported food and agricultural shipments. Traceability of shipments through the distribution system is required for the first time. Transporters of food and agricultural shipments must also keep records for inspection in case of a CBP detention. The information required is already being kept by transporters. The burden of reporting rests with the customs broker at the port of entry. Questions regarding this new bioterrorism regulation can be addressed to the American Embassy, Pretoria, SA, attention Health and Human Services Representative, phone 27-12-342-1048 extension 2025. This agency requires separate notification of food imports (by the customs broker) in addition to the CBP requirements for all shipments (notified by the carrier or agent).

FDA confirms the need for HACCP plans in processing seafood and juice. FDA import procedures are managed by the importer's customs broker who files entry documents with CBP prior to arrival of the transporter at a U.S. port. Regulated food shipments are subjected to inspection and sampling prior to release to the importer.

Customs and Border Protection. The Customs and Border Protection Agency establishes bioterrorism policy and manages port of entry inspections of food products and agricultural commodities. The Customs Agency name was changed to Customs and Border Protection Agency when the Department of Homeland Security was created. Declaration of cargo details must be presented to CBP no later than 24 hours prior to loading shipments onto carriers.

Since September 11, 2001 the attention of the Customs and Border Protection Agency has been exclusively on only part of the security problem: that of advance cargo shipment notification. Now, the physical security of ocean containers is being addressed. Under the CBP program known as the Container Security Initiative (CSI) of January 2002, Customs is required to establish bilateral agreements with other countries that will target and pre-screen high-risk containers in overseas seaports before they are loaded to vessels. New security technologies that are being researched by private industry are being tested for operational use to meet this need. The World Customs Organization (WCO) is leading the way by forming a task force, including representatives from 50 countries and 25 private companies, that was concluding its work in April 2004. Ports not included in the task force will benefit from the standards resulting from its work. The task force report is due in June 2004; its recommendations are said to include all modes of transport and will be consistent with U.S. positions. Difference between the United States and the European Union are yet to be fully resolved. A schedule for full implementation of these guidelines has yet to be determined.

At the June 2004 WCO Council meeting, a high-level strategic working group of customs directors-general will be formed as an ongoing discussion group for furthering security. Also on the agenda is the evolution of customs agencies beyond just inspection and revenue collection to becoming multifaceted border forces. This change has already occurred in the United States and Canada, where border inspectors have become experts in agricultural and food import inspection requirements besides contraband controls. The goal in doing this is to not only increase security but to facilitate trade by eliminating multiple inspection steps now being made by other national agencies.

Advance publicity of the task force's recommendations points to security at cargo place of origin as a major consideration. Existing export declarations typically provide sufficient data to conduct

an adequate cargo risk assessment. Customs administrations will be expected to provide more control over exports than they typically have done in the past by providing shared intelligence with importing companies, assigning unique consignment reference numbers and providing risk profiles of shippers. The net benefit to international shipping of this integrated control chain is the pre-clearance of goods upon arrival at port of entry.

Centers for Disease Control. The Centers for Disease Control investigate and report on food-borne illnesses and recommends more strict controls to the FDA, as necessary.

B. Canadian Regulatory Agencies

Health Canada is comparable to an African ministry of health in its responsibilities to ensure the safety of food for its citizens.

Agriculture and Agri-food Canada is concerned with phytosanitary issues.

Canadian Food Inspection Agency (CFIA), Plant Products Directorate, Food of Plant Origin Division controls safety and wholesomeness monitoring for compliance of:

- Federal grades (grades and standards exist for produce typically grown in Canada)
- Packaging requirements
- Labeling
- Anti-fraud activities

All importers of fresh produce must be licensed by CFIA. The issuance of import permits is a CFIA responsibility under the Plant Protection Act and supporting regulations. The International Standards Unit is responsible for development of phytosanitary standards under the International Plant Protection Convention (IPPC) and advises representatives at WTO meetings on sanitary and phytosanitary matters.

CFIA import requirements for fresh commodities are found in the Automated Import Reference System (AIRS) which can be accessed from their website, <http://www.inspection.gc.ca>, that also provides instructions on how to use the AIRS resource. The Application for a Permit can be downloaded from the same site. The application fee schedule is at the same site. The application will be processed within ten working days of receipt at: Plant Health Division, Permit Office, 59 Camelot Drive, Nepean, Ontario K1A 0Y9, Canada, or at 1-613-228-6605 by fax. A pest risk assessment (PRA) may be required.

CFIA import requirements for fresh commodities require the importer to be licensed. There are very few commodities having standards for grades (none of the African target commodities have a grade requirement), nor is an inspection certificate required for these commodities. Under certain circumstances, a phytosanitary certificate may be required and sometimes a risk assessment is requested prior to entry. It should be noted that since Canada is so far north, hardly any quarantine pests over-winter, so Canada is not likely to be as severe in these requirements as is the US.

The use of the universal product code (UPC) is not obligatory.

Canadian Department of Justice is responsible for maintaining consolidation of statutes and regulations. Fresh fruit and vegetable regulations (CRC, c.285) are organized in sections such as: grades and standards, health and safety, packaging and labeling, import trade, inspection and registration of established businesses.

Canada Border Services Agency (CBSA) replaced Customs Canada in December 2003.

Canadian Pest Management Regulatory Agency (PMRA) established tolerances or maximum residue limits (MRLs) for chemicals used on crops. Shipments found to exceed the MRL are deemed to be adulterated and cannot enter Canada.

Environment Canada is involved with the use of chemicals in agriculture. The label on consumer packages must contain the following:

1. Common name of the product, in English and French
2. Net quantity of the product, in English and French in imperial and metric
3. Complete name and address including postal address of the responsible party, in English and French
4. Grade name, in English and French
5. Country of origin, in English and French

The label on master shipping cartons that must appear on a principal display panel is required to show:

1. Common name of the product, either in English or French
2. Name and address of the responsible party, either in English or French
3. Grade name of the produce, either in English or French
4. Country of origin, either in English or French
5. Net quantity, either in English or French

Minimum letter size applies to all required markings and total markings must meet specific standards of size in proportion to the size of label. Any chemical preservatives must be described in both English and French. Nutritional information is not required, but when it appears it must be in both English and French.

HACCP in Canada is in effect only in the province of Ontario, introduced by the Ontario Ministry of Agriculture and Food (OMAF) in March 2004. There are 57 prerequisite program standards in the "HACCP Advantage" that include control programs, training, operational controls, and plant environmental controls. Guidebooks are being developed for distribution in the near future. It should be noted that Canada is a confederation of ten provinces and three territories, meaning there is much more freedom and independence from the national laws than in the U.S. It is not surprising, therefore, for larger provinces to have certain laws in effect that are considered not enforceable in other provinces or by the national parliament.

C. European Union Regulatory Agencies

European Food Safety Authority. The European Union has taken over responsibilities from individual member states for ensuring food safety, animal health, animal welfare, plant health, and the environment through a new General Food Law, which went into effect in February 2002. The general framework for the new agency was established by Regulation EC/178/2002. Through this legislation, the European Food Safety Authority (EFSA) was created. It provides independent and objective advice on food safety issues associated with the entire food chain. The EFSA is provisionally based in Brussels. By 2005, it will move to Parma, Italy where all its functions will be performed. Eight scientific panels share the food safety agenda on a permanent basis. The purpose of the EFSA is to:

1. Gather scientific data
2. Support work of scientific committees
3. Enhance communication
4. Suggest candidates for Board and Advisory Board members
5. Ensure liaison and collaboration with stakeholders, national and European institutions, and international bodies
6. Assist European Union in crisis management
7. Provide appropriate administrative support in areas of quality management and IT

Prior to establishing the EFSA, laws and regulations in member states were confusing and inconsistent. The goal of the EFSA is to harmonize existing national requirements in order to ensure the free movement of food and feed in the European Union. Initial work of EFSA panels has focused on animal feed standards, on biotechnology matters, and on human nutrition. Through its risk assessments, EFSA panels will focus on sound scientific bases for regulatory measures ensuring uniform food safety throughout member states.

The General Food Law is supplemented by targeted legislation on a wide array of food safety issues such as use of pesticides, food supplements, colorings, antibiotics, and hormones in food production, rules on hygiene and procedures on the release, marketing, labeling and traceability of crops and foodstuffs containing genetically modified organisms (GMO).

Risk analysis will be the underpinning of the European Food Safety Authority's work; the EFSA was an early supporter of risk analysis principles and their subsequent international acceptance. The three components of risk analysis (risk assessment, risk management, and risk communication) provide the basis for all food law. Scientific assessment of risk will be undertaken in an independent, objective and transparent manner based on the best available science. The enabling legislation allows for socioeconomic and environmental considerations to enter the decision-making process so scientific assessment of risk is not the sole basis for outcomes.

Mechanisms are in place to allow for greater involvement of stakeholders (general public, non-governmental organizations, professional associations, international trading partners, and trade organizations) through all stages in the development of food regulations.

This new EU integrated approach to food safety assures a coherent "farm to fork" set of

measures, with adequate monitoring while ensuring the effective functioning of the internal markets. Implementation of this approach involves the development of legislation and other activities to:

1. Assure effective control systems and evaluation of compliance with EU standards not only within the EU but also in third countries in relation to their exports to the EU
2. Manage international relations with third countries and international organizations concerning food safety, animal health and welfare, plant health, animal nutrition, and the environment
3. Ensure science-based risk assessments
4. Provide a general framework for those areas not covered by specific harmonized rules but where the functioning of the internal market is ensured by mutual recognition
5. Specify definitions, principles and obligations covering all stages of food and feed production and distribution.

The current food and feed control system will continue to apply until the new system enters into force, likely in January 2005. At that time, existing directives will be repealed and replaced by No. 89/397/EEC and No. 93/99/EC, which control foodstuffs. These two directives define the rules on the organization of the official control programs in member states including sampling and analysis and the setting of quality standards for laboratories carrying out official business. Enforcement is handled in three ways:

1. Audits of member states to ensure that EFSA requirements have been incorporated in national laws and regulations
2. Inspections of veterinary facility to ensure that food producers are meeting EU standards for feed and food
3. Validation of outside reports of probable failures in the food control system.

Most enforcement will remain in the hands of the individual member states. Serious breaches of the EU feed and food law will be a criminal offence.

The European Union makes a strong point that these more strict laws and regulations are not intended to drive the many traditional ethnic foods that can be found across Europe from the market. Quality improvements are expected, yet room is left for innovation, variety, and choice.

Staff of the European Food Safety Authority is expected to double to 140 members during 2004.

Pesticide residues in fruit and vegetables (maximum residue levels). European Council Directive 76/895/EEC of 23 November 1976 established maximum levels for pesticide residues in and on fruit and vegetables. Source of this regulation is the *Official Journal L 340 of 09.12.1976*. Between 1980 and 2004, there have been 17 amendments to the initial directive. They do not apply to exports since the importing country's standards prevail. Equally, exports from African countries must meet the standards of the EU directives only, unless national regulations require their own standards to be met as well. Of special note is that member states may establish *higher* standards of maximum residue levels than the EU. Random inspections are authorized.

Amendments to General Food Law. On March 9, 2004 the European Parliament voted in favor of strengthening the General Food Law by a series of amendments that were proposed in 2003 and that will become effective on 1 January 2006. Benefits are:

1. Improved efficiency of coordination between member states and the European Commission
2. A framework to support developing countries in meeting EU import requirements
3. European Commission funding for certain activities that enhance food and feed safety

Controls of food, feed, and live animals will continue to be primarily a responsibility of member states. Performance criteria for competent authorities and a harmonized EU-wide approach to the design and development of control systems in member states are included in the revision of the General Food Law. It will reinforce the verification of compliance with food and feed law and with animal health and welfare rules at all stages of production, processing, and distribution. Stricter rules on the accreditation of laboratories are included, such as introduction of management principles, documented control procedures, and internal audits. Member states must set up specific operational criteria covering elements such as staffing, training, and documented control procedures.

High-risk commodities such as groundnuts will be sampled for aflatoxin on a more frequent basis than normal, based on risk assessment. More strict import procedures for food of plant origin will be imposed.

Where a member state's food and feed control system is inadequate, a new regulation will allow the European Commission to take interim measures to ensure the protection of human health, animal health, animal welfare, and the environment. Measures may include banning a member state's food and feed into the rest of the EU.

Developing countries are already required to present guarantees that products exported to EU member states meet EU standards. This regulation provides for a number of initiatives, particularly training projects, to make it easier for them to implement EU requirements. These activities will be organized as part of the EU's external aid program and will primarily focus on the countries listed by the Development Aid Committee of the OECD.

Three existing directives will be repealed concurrent with the effective date of these new actions, expected to be 1 January 2006:

Directive 70/373/EEC Rules on sampling and analysis
 Council Directive 95/53/EEC Rules on the official inspections in animal nutrition
 Council Directives 89/373/EEC and 93/99/EC Rules on official control of foodstuffs

The EU principle of mutual recognition is unaffected by these changes. This means that the member states will recognize commodities from other countries even if they are produced slightly differently, provided that they meet certain basic criteria.

New European proposals for identifying and inspecting high-risk shipments differ from those that U.S. authorities have developed.

D. Private Sector Quality Standards

Major markets have established their own quality standards that supplement government grade (condition) standards. Grade (condition) standards include:

- Size
- Color
- Firmness
- Shape
- Interior (hidden) damage

Quality standards pertain mostly to sensory issues:

- Overall appearance
- Stems cut at the appropriate place
- Dryness (discoloration) of stem
- Freshness
- Presence of dirt

In international trade, there are several private sector quality standards. There is a "Tokyo Standard," for example, believed to be the highest in any international market. In the UK, there is the "British Retail Consortium (BRC) Standard," which was established by the five largest supermarket chains to ensure uniformity of imported product. Overlaying the BRC standard is the "EUREPGAP Standard," which can easily lead to confusion at pack-houses. EUREPGAP was established by a group of European agricultural interests (the Euro-Retailer Produce Working Group, Good Agricultural Practices) following public outcry over the lack of adequate food safety controls and no traceability back to origin, especially of imported goods. EUREPGAP standards provide a product quality verification framework with an overlay of environmental and social conditions that must be met by the suppliers of fresh produce and cut flowers. EUREPGAP standards extend to seed, seedlings, soil and water management, fertilizer, pesticides, harvesting methods, post-harvest treatments, waste management, worker health and safety along with environmental management. The EUREPGAP organization serves as its own accreditation body and auditing is carried out by EUREPGAP-sanctioned groups. There is no labeling requirement per se. A product identification system, such as the one proposed by EAN-UCC Traceability Implementation (Annex C) calls for documentation of product movement from the farm to sale. Traceability has become part of the business agreement between exporters and importers covering shipments into some of the larger international markets.

In May 2000, a worldwide retailer initiative known as the Global Food Safety Initiative (GFSI) came into existence. It is facilitated by CIES-The Food Business Forum. To date, four European standards are included, which are:

- The British Retail Consortium (BRC) standard
- The Dutch HACCP Code
- The EFSIS standard
- The International Standard for Auditing Food Suppliers (IFS)

A fifth standard, SQF 2000, Safe Quality Food, was announced in April 2004 pertaining to agricultural produce. This food safety standard is owned by the Food Marketing Institute (FMI) based in the United States.

In order to support the ongoing process of benchmarking, the Global Food Safety Initiative will publish a fourth edition of its Guidance Document in July 2004 to cover all fresh fruit and vegetables. The GFSI is working towards harmonization among all other farm assurance schemes. Key objectives of the Global Food Safety Initiative are to:

1. Implement a scheme to benchmark food safety standards worldwide
2. Build and implement an international early warning system
3. Act as a knowledge base to promote cooperation in the food sector worldwide with national and pan-national governments and authorities
4. Assist the food sector with consumer information programs and facilitate communications with interested parties in the food supply chain
5. Encourage Good Retailing Practices (GRP)

Membership in CIES-Food Business Forum includes 70 percent of the world's largest food retailers and their suppliers. More than 200 retailers and 200 suppliers in over 50 countries are part of the international CIES network.

Traceability will be one of the key topics at the next CIES conference in Paris on 7-8 October 2004. Traceability in the food supply chain is the subject of a new publication, released in April 2004, which is a concise guide to implementing traceability. The European Union expects to have a traceability system in place by January 2005 and similar requirements are also planned for food companies in the U.S. This CIES guide can be downloaded from:

<http://www.ciesnet.com/pdf/globalfood/impl-traceab-doc.pdf>

Traceability is mentioned in the International Standards Organization (ISO) 9001:2000 series of standards as one aspect of a quality management system. Many businesses are establishing traceability systems, whether or not there is a legal requirement to do so. Also, these traceability systems meet the requirements of the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Section 306 in the United States.

Underlying food safety and grade standards, provided by national regulations at origin and destination, provide a basis for business-to-business specifications. Private sector standards in most developed markets are more severe than those of governments. Such additional private sector requirements exist in the United States, Canada, and Europe as a condition determined by consumer discrimination and as a means of differentiating retailers. These buyers carry out random inspections of conditions at the products' origin based on their individual standards. The 4th International Food Safety Conference will take place on 3-4 February 2005 in Rome.

SECTION VIII

Organics

A. International Standards

Basic international organic standards have been developed by practitioners in organic production and processing on behalf of the International Federation of Organic Agriculture Movements (IFOAM). These standards are considered the benchmark for all national organic programs. Their standards address ecosystem management (water, soil, biodiversity), genetically-modified plant material, pesticides, fertilizers, use of irradiation in processing, transport and social justice.

IFOAM's accreditation body is the International Organic Accreditation Services, Inc. (IOAS). Auditing functions are carried out by IOAS-accredited third-party certifying bodies.

The basic standards for production and processing, and accreditation criteria for certifying shipments, constitute the IFOAM *Norms* that are the basis for the Organic Guarantee System that took effect in 1992.

The IFOAM Accreditation Program, based in the United States, is a service offered to certification bodies. The IFOAM seal is a market-oriented mark of compliance with the IFOAM Organic Guarantee System. IFOAM reviews accreditation applications, conducts site evaluations, and administers the use of the seal.

Important international sources of information include:

- The Organic Agricultural Association of South Africa (OAASA) covers issues and news
- IFOAM international standards setting body
- FAO Pages: discussion of what is happening organically worldwide
- CODEX ALIMENTARIUS: UN standards for food safety, basic to organics
- GROLINK: organic intelligence with emphasis on developing countries
- Organic research website: www.organicresearch.com
- European Union Organic Portal information on legislation, issues and markets in EU
- United States National Organic Program (USNOP): official USDA agency for organics regulation
- Soil Food Web information on composting and microorganisms
- DeMeter World news of biodynamic agriculture
- Rodale Institute: pioneer researcher and publisher on organic farming

B. United States Standards

Shipments into the United States are under the control of the USDA-Agricultural Marketing Service (AMS) as enforcer of the new federal regulation. AMS also accredits certifying agents. The private Organic Trade Association (OTA) manages certifying agents. The OTA Executive Director is Ms. Katherine DiMatteo based in Greenfield, Massachusetts, phone (413) 774-7511,

e-mail: kdimatteo@ota.com. This association has 1,300 members (some are based outside the United States) and an international Board of Directors. The National Organics Program (NOP) legislation is consistent with the ISO Guides 65 and 61, but the NOP differs substantially with regulations in the European Union having to do with production, handling, labeling and allowed/prohibited activities.

IFOAM publishes books and pamphlets useful to organic producers and processors. One particular book entitled *Organic and Like-minded Movements in Africa*, published in 2003, presents a wealth of data and analyses from 22 countries, providing substantial evidence on the positive future of African agriculture.

Noteworthy to potential African suppliers of baby fresh vegetables, there are only 13 fresh vegetable suppliers listed in the roster of Organic Trade Association members. Here is a strong opportunity for African exporters of organic vegetables to become recognized by this international organics organization. African exports to the United States must be inspected and certified by a USDA-accredited agency at origin; no southern Africa agency has yet applied to become USDA-accredited.

Organic Trade Association members include companies which supply inputs for organic production such as: amino acids, beneficial organisms, biological controls, biological pesticides, botanical pesticides, compost products, disease controls, enzyme products, fertilizers, fungicides, inoculates, insect repellants, IPM supplies, irrigation supplies, microbiological treatments, micronutrients, minerals, oils, pest control products, plant protectorants, potassium products, seed/seedlings, soil conditioners, spray adjuvants, and weed control.

Marketing of organic produce in the United States is still in its formative stage. Alliances and business contracts are being put together rapidly now that a national law is in effect. In discussions with the president of the Tennessee Organic Growers Association based in Nashville, it was learned that during winter months, organic produce is being imported from the Southern Hemisphere, particularly Chile, Australia, and New Zealand. Since air cargo is frequently scheduled into Southern California, these imported shipments are being consigned to a Los Angeles, California distributor who reships as far as the east coast of the United States (an additional 3,000 miles). As for American distribution of produce from suppliers in Europe and Africa, a new distribution center opened in June 2004 outside Philadelphia, Pennsylvania from which product distribution to retailers and food service companies across the U.S. will be made on a daily basis. Product availability and pricing information will be handled through websites so transactions can be made electronically. For African exporters who are just beginning to establish a U.S. market, these huge distribution companies become a very attractive alternative way of selling product. Positive features are that suppliers will likely be paid fast — perhaps electronically — without bank intermediaries, and random shipment quality failures will not affect the business relationship as severely as when an importer has a sole African supplier.

C. European Standards

The European Commission Council Regulation No. 2092/91 (and Amendments) officially recognizes the notion of organic farming in certain member states and regulates labeling of raw and processed products.

A comparison of EU and U.S. standards for fresh fruit and vegetable production follows:

1. Both systems are similar in the following policies:

- Third-party certification
- Audit trails (transparency)
- Annual inspections
- Accreditation
- Materials lists
- Defined conversion periods
- Sustainable farm plan

2. Cultural and political differences are substantial:

While the United States uses one language and has rather similar subcultures, EU member states have differing languages and cultures.

In the U.S., federal laws supercede state laws while in the EU, each sovereign state can grant exceptions to established EU 2092/91 rules and regulations.

3. Some cropping standards differ:

- Conversion period is different
- Manure restrictions vary
- Buffer zones are required in the U.S., in Europe they are not required

4. The U.S. observes detailed processing (handling) regulations while in Europe inspection regulations apply.

5. Labeling requirements are similar

6. Materials and the materials process differ:

Materials generally must be listed in the EU; in the U.S. natural materials are allowed unless prohibited, and synthetic materials are prohibited unless allowed.

The U.S. requires published criteria based on a public process including scientific reviews and hearings; in the EU, rulings are published based on member state requests.

7. Accreditation:

In the U.S., federal authority controls accreditation and the USDA accredits certifiers; in the EU, accreditation is the responsibility of each member state.

8. A U.S. umbrella certification allows shipping to all states. Under EU rules, Transaction Certificates are required for each shipment.

9. Under U.S. federal authority, access to all states is allowed; in the EU, access to all the sovereign states is not guaranteed

D. United Kingdom Standards

A UK Register of Organic Food Standards (UKROFS) exists and is applicable until the EU standards become effective. That date has not yet been determined.

E. Canadian Standards

Canada does not have a codified federal regulation covering organic standards. A voluntary National Standard for Organic Agriculture was released in 1999. Currently, the Canadian General Standards Board (CGSB) is responsible for working to ensure that the standard is compatible with Codex Alimentarius food safety requirements and other countries' organic standards.

The Standards Council of Canada (SCC) accredits independent certifying bodies to CGSB standards and to ISO guidelines. Provincial authorities may also accredit certifying bodies.

According to the Canadian Food Inspection Agency's Guide to Food Labeling and Advertising, food products which are labeled or otherwise identified as "organic" are expected, at a minimum, to comply with the production, processing, packaging, labeling, storing, and distribution provisions of the National Standard for Organic Agriculture.

Until a codified standard is in effect, an African exporter would follow the guidelines set forth by their importer/partner only.

F. South African Standards

New standards, which were published as a draft in October 2001, are still not acted upon by the parliament. These draft standards can be found in Annex B.

Since 2001, Ecocert International has subcontracted with AFRISCO Pty for inspection and administration of organic certification in South Africa. AFRISCO Pty, based in Pretoria, is a leading Organic Certifying Agency in South Africa whose work was launched in the same year. Their mission is to work with organic producers in all southern African countries to reach standards for ISO 65 accreditation, a requirement for an organization to be able to certify for the EU market. Ecocert International is now an accredited certifier for the EU, United States, and Japan.

The facilities of Ecocert International can:

- Develop standards for all aspects of organic production and processing in accordance with requirements of major domestic and international markets
- Provide certification services at reasonable costs
- Promote skills in organic production in the region, particularly for smallholders

- Develop awareness by producers of national and international markets
- Promote health and environmental benefits of organically-grown produce
- Develop export opportunities

Training programs for smallholder farmers have been developed based on simplified curricula. Internal control systems are taught which reduce the costs of becoming organically certified. Farm certification methods are based on those used in Europe and elsewhere. Principles taught cover more than just farming without chemicals. Training includes understanding and managing enhanced soil nutrition, and insect and disease (pest) inhibition in a natural, sustainable manner such as Integrated Pest Management (IPM).

There are no other countries within SADC that have accrediting authorities.

SECTION IX

Marketing Strategies

This section is a discussion of the several types of markets found in developed countries. It is not necessary to select a single marketing strategy for exporting. Profitability and risks of loss are issues to be considered in making a choice. The number of days it takes to receive payment is an important factor in determining profit/loss for any of the marketing options. A strategy should be selected based on issues such as: 1) building a company trade mark identity; 2) building a national product identity; 3) plans to remain a small or medium size shipping entity, as compared to a large association of several growers; 4) length of harvesting period; 5) willingness to grow specific varieties that are requested by importers; 6) willingness to meet the strict requirements of growing organically; 7) flexibility in decision-making.

Auction markets are the leading means of selling cut flowers. The Alsmeer Flower Auction Market in Holland is the world's largest. The main building is about one mile long. Everything from handling systems to the auction itself is automated. Pictures of the auction are in Annex B. A large percentage of the cut flowers which pass through this market is destined for the United States and Canada. The majority is distributed throughout Europe. Among the largest fresh fruit auctions are Rotterdam and Marseilles. Others in Europe are smaller but important, although inroads have been made in recent years by e-commerce.

Wholesale markets in London, Rotterdam, New York City, Berlin, Paris, Marseilles, Moscow, Hong Kong, and Tokyo pass a great volume of fresh fruit and vegetable business through their facilities daily, with shipments arriving by both air and sea. Consignment to brokers in wholesale markets is risky since it is impossible to predict how much of a similar commodity might arrive in the market on the same day from other sources. If a particular produce item is short, a windfall might be realized; however, if the market is flooded with similar commodity it is likely that not even the grower's costs would be covered by the low price obtained that day.

Direct selling is the way of the future, largely through computerized e-commerce. In an African environment, it is not likely that smallholder farmers, even in association with each other, could justify the cost of supporting e-commerce sales. Perhaps a broker, representing several grower associations, could be used as an e-commerce intermediary. Arrival of a few container-loads of a commodity by sea on any given day can cause a significant drop in the wholesale price. Price instability can be avoided by direct selling to large retailers such as Wal-Mart, Tesco, Safeway, Kroger, Sainsbury's and others that can absorb large quantities of product and that can cope with an occasional missed delivery date.

Direct supplier is an option for farmers entering the international marketplace. A season's crop is sold at a fixed (average) price to a single buyer, using the importer's carton label for packaging. The method eliminates the chance of a financial windfall but it provides stability and predictability to the business venture. This fits the needs of a northern hemisphere grower operation, such as Dole or Del Monte, which needs southern hemisphere sources of supply during the off-season. Larger suppliers might offer only a part of their crop to a direct supplier business deal with the remainder going into his own label for local or international markets.

SECTION X

Hazard Analysis and Critical Control Points in Food Processing

Hazard Analysis and Critical Control Points (HACCP) is a systematic approach to the identification of biological (pathogenic and bacterial), chemical and physical hazards in food, the assessment of risk (the likelihood and severity of the occurrence), and the control mechanisms that can be installed to prevent or limit those hazards. HACCP is a preventive strategy, written as a step-by-step plan that describes the handling process in a facility from where the raw product enters, to how and by whom it is manipulated, packaged, stored and loaded into transport vehicles. The points in the process where a system failure could result in a food safety hazard are called "critical control points" or CCPs. Under a final HACCP plan, CCPs are monitored and when a failure occurs, the process is stopped until corrective action is taken. This is a self-policing system with no government inspectors observing the processing. The role of government is one of random auditor of the documented failures as measured against the HACCP plan.

HACCP was first conceived as a means to prevent food-borne illness in the NASA space program. It has been endorsed by Codex Alimentarius as a food safety program. In the United States, the Food and Drug Administration (FDA) recommends its use in their effort to reduce the numbers of deaths and illnesses which, besides exacting personal costs, have adverse impacts on the general economy and on public health care costs. U.S. seafood importers are required to have an HACCP plan on file from their overseas suppliers. The Canadian health authorities and the European Union have also endorsed the use of HACCP plans. As a result, HACCP is becoming a widely-accepted control mechanism for improving food safety, increasingly used for raw agricultural commodities, ingredients and finished food products, including fresh fruit and vegetables, spices, juices, seafood, meat and poultry processing. Those companies with active HACCP plans will have definite advantages over those that do not. Good Manufacturing Practices (GMPs) and Standard Operating Procedures (SOPs) must be identified and be used in a plant prior to implementing the HACCP plan.

HACCP offers a number of advantages over the old system of command and control by government inspectors, most importantly:

1. Focus on identifying and preventing hazards from contaminating food
2. Basis in sound science
3. Permits more efficient and effective government oversight, primarily because the record-keeping allows investigators to see how well a firm is complying with food safety laws over a period of time rather than how well it is doing on a given day
4. Places responsibility for ensuring food safety appropriately on the food manufacturer or distributor
5. Helps food companies compete more effectively in the world market
6. Reduces barriers to international trade

Companies are responsible for keeping records of failures and their internal audits, with reviews

of these audits being performed randomly by government health officials.

There are no standard HACCP plans. The management of every participating company devises its own plan, which varies according to the uniqueness of its operation. In the United States, there are seven steps in creating a HACCP plan:

1. Identify hazards and assess risks for each one
2. Identify each critical control point in the flow of product(s)
3. Establish acceptable maximum and minimum limits for each identified critical control point
4. Identify the system to be used to regularly monitor the critical control points
5. Determine corrective action(s) and responsible persons for taking action when limits are exceeded
6. Establish a recordkeeping system of all monitored activities (physical, chemical, microbiological, sensory, visual), corrective action taken including disposal of product
7. Establish procedures to verify reliability of monitoring system for products and equipment used in the facility.

To determine critical control points, the HACCP analysis proceeds as follows:

1. Does this step involve a hazard of sufficient risk and severity to warrant its control?
2. Does a preventive measure exist for the identified hazard?
3. Does this measure eliminate or reduce the likely occurrence of a hazard to an acceptable level?
4. Could contamination with an identified hazard occur in excess of acceptable level?
5. Will a subsequent step, prior to the food being consumed, eliminate the identified hazard or reduce the likely occurrence to an acceptable level?

An essential requirement of success in operating under a HACCP plan is that *all* managers and employees must have an understanding of the plan and the reasons for its use.

In Europe, the International Standards Organization's ISO 9000 series of standards have been applied to the food processing industry. The standards represent a management framework that can be applied to any type of organization. The 9000 series of standards can be used to establish a management system geared to quality control and customer satisfaction through consistent practices. It is normal to work for several years to obtain ISO certification. Every country has its own national membership organization that serves as the accrediting body and which performs audits.

In comparison, HACCP is a "living" document where change, when justified, can be accommodated within the system. HACCP is compatible with the ISO 9000 food safety management system, having several commonalities. In fact, in Europe, HACCP has been officially endorsed and is replacing ISO 9000 as the food safety system of choice. The European HACCP is more extensive than the guidelines used in the U.S., having the twelve steps recommended by Codex Alimentarius and adopted by the South Africa Bureau of Standards 1999 Code of Practice. In Europe, the steps for developing HACCP are:

1. Assemble the HACCP team within the company (management and labor)

2. Describe the company's final product
3. Identify the intended use of the company's final product
4. Construct a product flow diagram within the production facility
5. Make an on-site confirmation of the flow diagram
6. Conduct the hazard analysis
7. Determine the critical control points and identify them by name
8. Establish target levels with maximum and minimum tolerance limits for each critical control point;
9. Set up a monitoring system for each critical control point
10. Determine corrective actions to be taken when a limit is violated
11. Establish verification and review procedures
12. Establish record-keeping and documentation and assign responsibilities among the HACCP team.

Upon completion of such an exercise, the HACCP team has gained a complete and intimate awareness of the operation of the facility and has gained ownership of the process and the final plan.

It cannot be emphasized enough that HACCP is the internationally-accepted food safety management tool and must be in place in a food processing facility in order to trade with the developed world.

Expert help with preparing HACCP plans is available in reference libraries. Books and monthly publications have covered this subject in recent years. Expert advice is especially available in South Africa where there are three kinds of HACCP specialists: 1) those who teach HACCP principles; 2) those whose expertise is in installing HACCP plans in an operation; and 3) those who can conduct audits of the installed HACCP plan in operation. Outside expert advice is highly recommended. Internet resources are available at: <http://ifse.tamu.edu/haccpall/html>.

Benefits of having an HACCP plan in place are: 1) consumer confidence; 2) brand-name protection; and 3) increased productivity and efficiency arising from a more intimate awareness of the entire facility's operation.

How to start? When management is comfortable with having adequate Good Manufacturing Practices and food safety plans in effect, put an HACCP team together, draft a flowchart, assess the hazards process, and verify the entire system, making changes as necessary.

SECTION XI

Target Commodities: Specific Market Requirements and Unique Characteristics

A. Baby Vegetables

Asparagus. Scientific name *Asparagus officinalis L.*, a perennial of the *Liliaceae* family.

There are two forms of asparagus in the marketplace: white (blanched), and green. White asparagus is popular in Europe and Asia; green asparagus is popular in the U.S. and Canada, as it is grown predominantly in Mexico, southern California and Washington state. With a high metabolic rate of respiration after harvest, asparagus is among the most perishable crops. Larger diameter spears are preferred in Germany, thin spears are preferred in Japan, and medium-size spears are preferred in North America.

Quality characteristics: high-quality green asparagus spears are dark in color with tightly closed and compact tips. Stems are straight, tender and glossy in appearance. Spears with green butts are preferred over the spears with white butts, as the latter are associated with increased toughness.

Horticultural maturity indices: Spears are harvested when they reach 20 to 25 cm (8 to 10 inches) in length for the normal market; therefore, spears smaller than 20 cm (8 inches) are considered to be "baby asparagus."

Grades and packaging: Spears of uniform diameter and color are tied in bunches, then trimmed to uniform length and placed in trapezoidal-shaped packaging to minimize geotropic bending during transit. Headspace must be designed into the package to allow for elongation during transport. Moist pads are placed in the bottom of the package to maintain turgidity and to replace moisture lost through evaporation.

Pre-cooling conditions: Being highly perishable, asparagus must be cooled immediately after harvest to 0 degrees C (32 degrees F). For every hour delay in pre-cooling, market life is reduced by several hours. Asparagus is typically sorted and graded in cool water, then pre-cooled in mechanical coolers following packaging. Hydro-cooling is typically used.

Optimum holding and transport conditions: Ideally, temperatures of 0 to 2 degrees C (32 to 35.6 degrees F) are maintained during holding rooms awaiting transport with 95 to 99 percent relative humidity (RH), yielding 14 to 21 days expected market life. These processes also protect against flavor loss.

Controlled Atmosphere (CA) consideration: Elevated CO₂ is beneficial in preventing decay and slowing toughening of the spears, so long as temperature standards are maintained. It is possible to ship asparagus by sea successfully when CA is used.

Post-harvest pathology: The most common post-harvest disease on asparagus is bacteria soft rot

(visible soft pits) which is controlled by maintaining temperatures at the lower end of the acceptable range. Fungi such as *Fusarium*, *Penicillium* and *Phytophthora* are also associated with post-harvest decay or spoilage.

Quarantine issues: Asparagus is tolerant of fumigation if live common insects ("hitchhikers") are found.

Beans. Scientific name *Phaseolus vulgaris Leguminosae*, a large family of snap and long beans with fleshy pods and seeds.

Quality characteristics: straight, bright color with fresh appearance free of defects, tender yet firm. The diameter rather than length is a good indicator of quality. Pods with only slight seed bulges are preferred, indicating tender, young seeds. They should snap easily. Signs of lesser quality are over-maturity, broken pieces, dehydration, chilling injury (blackening) and decay.

Horticultural maturity indices: Harvest is normally 8 to 10 days following flowering, when pods are bright green and fleshy.

Grades and packaging: In some markets, grades are published for beans. The United States uses U.S. Fancy, U.S. No. 1 and U.S. No. 2 grading based primarily on external appearance. Weight per carton is dictated by market requirements, whether final market is food service, retail or for processing. Waxed cartons and thin plastic film liners are helpful in reducing moisture loss.

Pre-cooling conditions: Beans can be hydro-cooled successfully — especially in dry climates where dehydration is a concern — but product must be dried quickly following the cooling. Forced-air cooling is the method of choice for packed beans.

Optimum holding and transport conditions: Ideal temperatures are 5 to 7.5 degrees C (41 to 46 degrees F) with 95 to 100 percent relative humidity (RH) which allows 8 to 12 days market life. Chilling injury can be a problem with some varieties. Because beans are highly perishable and sensitive to ethylene exposure, they should be handled very quickly and carefully.

CA consideration: At recommended storage temperatures, an oxygen level of 2 to 5 percent reduces respiration which extends market life, maintains color and reduces decay.

Post-harvest pathology: Decay organisms will attack fresh pod beans as a result of chilling injury, surface moisture or mechanical injury. Most common are fungi and watery soft rot.

Quarantine issues: None

Broccoli. Scientific name *Brassica oleracea Leguminosae*. Broccoli is an annual crop that matures in about 75 to 95 days and can be grown year-round in warmer climates. It is a delicate commodity, with extreme sensitivity to ethylene gas and bruising, so it must be handled a minimum number of times with great care, and protected from forklift gases.

Quality characteristics: High-quality broccoli has either dark or bright green color with closed

flower buds, and is firm and compact. There are several varieties, some of which have been developed for much longer market life, anticipating longer transport periods for the international market. It is possible to transport broccoli by sea successfully.

Horticultural maturity indices: Over-maturity is characterized by open buds.

Grades and packaging: In the United States, three grades exist: U.S. Fancy, U.S. No. 1 and U.S. No. 2, based on external appearance, damage, expert trimming and stalk diameter. It is normally bunched with two to three heads bound together. Packaging is in waxed cardboard cartons with packaging weight being determined by end use: food service, retail, or further processing. In recent years, heads are trimmed from stalks before packaging and individual florets are packed in plastic film bags.

Pre-cooling conditions: Field-packed broccoli is commonly cooled by injecting liquid-ice (slush) into the waxed cartons. Ice maintains temperature and humidity during holding and transport at the ideal levels. Sometimes hydro-cooling or forced-air cooling is used prior to distribution.

Optimum holding and transport conditions: Recommended is 0 degrees C (32 degrees F) at 98 to 100 percent relative humidity which, if maintained, can support a 14 to 21 day market life. Loose ice in cartons can help maintain these temperature and humidity conditions. Perforated plastic film carton liners also help. Signs of lost quality are wilting, yellowing buds and leaves, open buds and decay.

CA consideration: Best atmosphere for broccoli is between 1 to 2 percent oxygen and 5 to 10 percent carbon dioxide, which, when used, can double the market life. Special film plastic bags are often used with broccoli to provide individual-package CA.

Post-harvest pathology: Grey mold rot (*Botrytis cinerea*) is the most commonly reported condition found during market life.

Quarantine issues: None

Brussels Sprouts. Scientific name *Brassica oleracea L.* This plant is a tall-stemmed cabbage, similar to the wild cabbage of southern Europe and cole crops such as cauliflower, broccoli, and cabbage. They require cooler growing conditions.

Quality characteristics: High-quality sprouts are 2.5 cm (1 inch) in diameter, not more than 7 cm (2.75 inches) in length, firm, with green outer leaves and a white cut end. Inner leaves should be light yellow, tightly arranged and without large air pockets between them.

Horticultural maturity indices: Harvest maturity is based on sprout size and compactness. Stem elongation, resulting in space between older leaves is a sign of over-maturity.

Grades and packaging: There are two grades in the American market: U.S.No.1 and U.S. No. 2, based on size, external appearance, decay and damage (these grade standards were established in 1954). They are typically packed loose in cardboard cartons with plastic film inner bags (for

retail), or loose with a plastic film carton liner (for food service or further processing). Packaging in vented polyethylene plastic bags is advantageous to reduce wilting.

Pre-cooling conditions: Effective cooling methods include vacuum-cooling, hydro-cooling, icing and forced-air cooling. Vacuum cooling is most effective when sprouts are moist to reduce wilting.

Optimum holding and transport conditions: Best for maintaining top quality is 0 degrees C (32 degrees F) and 95 to 100 percent RH. A market life of 21 to 35 days can be expected at those holding conditions. This is cut in half if product temperature is allowed to rise to 5 degrees C (41 degrees F) and only ten days market life can be expected at 10 degrees C (50 degrees F). Holding sprouts while attached to stems will prolong market life.

CA consideration: CA is beneficial to inhibit yellowing and decay and prevention of discoloration of the cut ends. It can partially compensate for thermal abuse during holding and transit.

Post-harvest pathology: Diseases of importance during holding and transport are bacterial soft rot (*Erwinia sp.* and *Pseudomonas sp.*), bacterial leaf spot (*Pseudomonas syringae* pv, *maculicola*) black or gray leaf spot (*Alternaria sp.*), and grey mold (*Botrytis cinerea*).

Quarantine issues: None

Carrots. Scientific name *Daucus carota L.* Carrots are taproots high in carbohydrates (sugars) and beta carotene (pre-vitamin A).

Quality characteristics: Quality criteria vary depending on end use. In general, carrots should be firm, straight from shoulder to tip, smooth with little hairiness, sweet with no harsh bitter taste, and with no signs of cracking or sprouting.

Horticultural maturity indices: Harvest maturity varies depending on the market and end use. For the fresh market, carrots are usually harvested partially mature when roots are about 1.8 cm (0.75 inches) in diameter at the shoulder. Late harvesting will extend market life by reducing likelihood of decay during longer transit periods. For the baby carrot market, they are harvested immature to ensure they are tender and sweet.

Grades and packaging: U.S. grades are for bunched and topped carrots only. Grades do not exist for baby carrots.

Pre-cooling conditions: Prompt washing and hydro-cooling to less than 5 degrees C (41 degrees F) is essential to maintain carrot freshness and crispness. Hydro-cooling in chlorinated water before packing is typical.

Optimum holding and transport conditions: Holding at 0 to 1 degree C (32 to 34 degrees F) will minimize decay and sprouting. High (98 to 100 percent) relative humidity will prevent desiccation and loss of crispness. Immature baby carrots can be held successfully for 14 to 21

days at lower temperatures, allowing for sea shipping to distant markets. Exposure to ethylene will create bitter flavor in unpeeled carrots but not in peeled carrots. Baby carrots can easily have a market life of 21 to 28 days when held in optimum conditions.

CA consideration: CA does not provide extended market life benefits.

Post-harvest pathology: The most common decay found in carrots is bacteria soft rot (induced by *Pectobacterium carotovora* or *Pseudomonas marginalis*), gray hold rot (*Botrytis cinerea*), Rhizopus soft rot (*Rhizopus spp.*), watery soft rot (*Sclerotinia sclerotiorum*), and sour rot (*Geotrichum candidum*). Best prevention is good sanitation during packing, holding and transport.

Quarantine issues: None

Cauliflower. Scientific name *Brassica oleracea L.* Derived from the wild cabbage native to southern Europe, requires cooler, moist growing conditions and better-than-average soil.

Quality characteristics: High-quality heads are white to cream in color, firm and compact, free of mechanical damage, decay, browning, or yellowing (caused by overexposure to sun). Heads must be surrounded by a whorl of trimmed green turgid leaves. Exposure to ethylene gas will cause curd discoloration and leaf yellowing.

Horticultural maturity indices: Harvest maturity is based on head size and compactness. Mature heads are more than 15 dm (6 inches) in diameter. Signs of over-maturity are protruding floral parts, browning or spreading of the curds.

Grades and packaging: There are two grades for mature cauliflower: U.S. No. 1 and U.S. Commercial. For food service, individual florets are cut and placed into plastic film bags. Baby cauliflower has no grade standards.

Pre-cooling conditions: Vacuum-cooling or hydro-cooling is advised prior to transport. Product should be wet if vacuum-cooling is used. Forced-air cooling can be safely used.

Optimum holding and transport conditions: Good quality can be maintained for 21 days if product is held at 0 degrees C (32 degrees F) and 95 to 98 percent RH. In comparison, at 15 degrees C (59 degrees F), only 3 days market life will be possible until browning, wilting, yellowing of leaves, and decay will set in.

CA consideration: Modest benefit can be expected from use of CA.

Post-harvest pathology: Black speck is a common disorder to some cultivars and to all when warm weather causes too-fast growth. Boron deficiency can cause brownish discoloration. Harvesting as "baby cauliflower" will reduce likelihood of pathological conditions. Bacterial soft rot (*Erwinia* and *Pseudomonas spp.*) and brown rot caused by *Alternaria spp.* can be avoided through good temperature management. Rough handling will result in rapid browning and decay.

Quarantine issues: None

Cucumber. Scientific name *Cucumis sativus L.* are of sub-tropical and tropical origin, a member of the *Cucurbitaceae* family along with melons and squashes.

Quality characteristics: Dark green, firm, narrowly cylindrical with small tubercles (warts) and spines on the rind. Spines are light green to yellow when mature. Flesh is crisp and white.

Horticultural maturity indices: Fruit can be harvested at various stages of development. Fruit are usually harvested immature at sizes ranging from 5 cm in length with jelly-like material surrounding the seeds. Harvesting at the right maturity for the intended market is very important.

Grades and packaging: Grades in the U.S. for the non-baby market are: U.S. Fancy, Extra 1, No. 1, No. 1 Small, No. 1 Large, and No. 2. based on uniform shape, firmness and dark green skin. Quality indices include size, freedom from mechanical damage, lack of decay and yellowing. Often wax or oil treatment is used to reduce moisture loss and improve appearance.

Pre-cooling conditions: Hydro-cooling and forced-air cooling are preferred methods.

Optimum holding and transport conditions: Market life is generally less than 14 days, even when protected at the ideal 10 to 12.5 degrees C (50 to 54.5 degrees F) and 95 percent RH, with visual and sensory quality rapidly declining thereafter. Too-low temperatures will severely damage cucumber. Extreme sensitivity to ethylene gas is a problem.

CA consideration: Little benefit is realized from use of CA.

Post-harvest pathology: Many diseases are a significant source of market loss, especially *Alternaria* spp., *Didymella* black rot, *Pythium* cottony leak, and *Rhizopus* soft rot.

Quarantine issues: None

Eggplant. Scientific name *Solanum melongena L.* is of the nightshade family. The edible portion is the immature fleshy pulp of the fruit. Skin is shiny and smooth with an oval, long round or pear-shaped body. Color may be black, purple, yellow, white, or striped. Most popular are: Standard (American), Japanese, Italian, Philippine, Thai, and Chinese.

Quality characteristics: Appearance of fresh green calyx, firm flesh and shiny skin, free of blemishes and mechanical damage and appropriate color by type.

Horticultural maturity indices: Time from flowering to harvest, depending on type, can be from 10 to 40 days. Eggplant is harvested at a wide range of developmental stages. Fruit is harvested immature before seeds begin to significantly enlarge and harden. Firmness and glossy skin are indicators of maturity.

Grades and packaging: In the U.S., grades for non-baby eggplant are: Fancy, U.S. No. 1, U.S. No. 2, and Unclassified. Distinction between sizes is solely based on size, external appearance

and firmness. Sizes are defined as: Small, Medium, Large, and Extra Large. Some varieties are much more susceptible to moisture loss in which case it is likely that the calyx or the entire fruit will be dipped in a chemical solution to retard senescence.

Pre-cooling conditions: Rapid cooling to 10 degrees C (50 degrees F) immediately after harvest is necessary to retard discoloration, weight loss, drying of calyx and decay. Hydro-cooling and forced-air cooling are best for eggplant.

Optimum holding and transport conditions: Market life of eggplant is usually less than 14 days even when held at the ideal conditions of 10 to 12 degrees C (50 to 53.6 degrees F) with 90 to 95 percent RH. Lower temperatures will cause chilling injury, surface pitting and scald (sunken brown spots) followed by *Alternaria* sp. decay. Ice should never come in contact with the skin and handlers should be aware that eggplant is sensitive to odor transfer, particularly from ginger, onions, and the like.

CA consideration: CA offers little benefit to eggplant quality maintenance.

Post-harvest pathology: Post-harvest diseases most often occur in combination with chilling injury. Common fungal pathogens are: *Alternaria* (black mold rot), *Botrytis* (gray mold rot), *Rhizopus* (hairy rot), *Phomopsis* (rot), and *Phytophthora* (soft rot).

Quarantine issues: None

Peas. Scientific names *Pisum sativum* var. *macrocarpon* Ser. has soft, edible pods. The snow or sugar pea has a flat pod with minimal development of the seeds, best grown under cool, moist conditions.

Quality characteristics: High quality peas have uniformly bright green color, are fully turgid and free from defects and mechanical damage. Stems and calyxes should be green. Peas lose sugars and flavor rapidly after harvest unless they are promptly cooled to 0 degrees C (32 degrees F).

Horticultural maturity indices: For best quality, peas should be harvested before physiological maturity, i.e., before seeds deform the hulls yet at maximum size. Frequent harvesting is, therefore, necessary.

Grades and packaging: There are no grades for snow or sugar peas but standards should be observed based on external appearance, no over-mature or excessively small sizes, not badly misshapen or water-soaked, fairly well-filled, fresh, free from decay or damage from freezing, hail, no dirt or leaves or other foreign matter, mildew or other disease, signs of presence of insects or mechanical damage. Best quality snow or sugar peas are 7.6 to 9 cm (3 to 3.5 in.) long and 1.9 cm (0.75 in.) wide, typically shipped in 4.5 kg (10 lb.) cardboard cartons.

Pre-cooling conditions: Peas must be promptly pre-cooled after harvest by either forced-air cooling, hydro-cooling or vacuum-cooling, the former being the preferred method.

Optimum holding and transport conditions: 7 to 14 days market life is expected if held at 0

degrees C (32 degrees F) with 95 to 98 percent RH.

CA consideration: Very little research has been done that proves or disproves the benefits of extended market life on snow or snap peas through the use of CA. Therefore, CA should not be considered until there is stronger indication of benefit.

Post-harvest pathology: Because peas have a high respiration rate, heat generated by unrefrigerated peas will promote decay quickly, reducing expected days of market life to hours. Blemishes which reduce quality can be caused by *Alternaria alternata* blight, *Anthraco*se due to *Colletorichum*, *Ascochyta* pod spot, powdery mildew due to *Erysiphe* spp., gray mold (*Botrytis cinerea*), soft rot (*Sclerotinia sclerotiorum*), Rhizopus rot and bacterial soft rot are the many causes of market loss due to poor pre-harvest practices, careless harvesting, rough post-harvest handling and improper grading before shipping. Pods must be kept dry.

Quarantine issues: None

Squash. Scientific name *Cucurbita pepo* is a member of the Cucurbitaceae family. There are six horticultural groups of summer squash: cocozelle, crookneck, scallop, straightneck, vegetable marrow and zucchini — all of which can be grown as "baby squash" year-round in many countries.

Quality characteristics: Tenderness and firmness are the major quality characteristics. Surface should be shiny, free of physical injury and firm to the touch. As little as 3 percent moisture loss can cause shriveling. Moisture loss can be reduced by use of a light wax coating which also reduces chaffing during transport.

Horticultural maturity indices: With baby squash, seeds and flesh are tender and slightly sweet, picked less than one week after flowering.

Grades and packaging: There are no grade standards for baby squash. Product in consumer packaging (in trays with plastic film overwrap) is typically shipped in corrugated cartons.

Pre-cooling conditions: Prompt pre-cooling after harvest maximizes market life. Use of room-cooling, forced-air cooling, or hydro-cooling are acceptable methods for removing field heat from squash.

Optimum holding and transit conditions: Being highly perishable, a 14-day market life is the maximum expected at 5 to 10 degrees C (41 to 50 degrees F) with 95 percent RH.

CA consideration: Use of CA to extend market life results in minimal value.

Post-harvest pathology: Decay caused by fungal and bacterial pathogens can cause significant post-harvest losses. *Alternaria* rot is the most common disease.

Quarantine issues: None

Sweet corn. Scientific name *Zea mays L.* is an annual grass of the Poaceae (Grass) family. High initial sugar content coupled with inhibited starch synthesis doubles the potential post-harvest life of sweet corn.

Quality characteristics: Uniform size and color, sweet, plump, tender, well-developed kernels, fresh, tight, free from insect injury, mechanical damage or decay.

Horticultural maturity indices: Harvest maturity is determined by a combination of ear fill, silk drying, kernel development, kernel sweetness, and kernel tenderness. A milky juice represents proper maturity.

Grades and packaging: There are no grades for baby corn. Consumer packaging (in trays with plastic film overwrap) is typical, shipped in corrugated cartons.

Pre-cooling conditions: Rapid removal of field heat is essential to maximize market life. Pre-cooling to 0 degrees C (32 degrees F) within one hour of harvest and hold/transporting at the same temperature level is recommended. Vacuum-cooling, being the fastest of the alternatives, is best for sweet corn. In-carton slush ice is sometimes used with good results.

Optimum holding and transport conditions: Loss of sweetness and tenderness is dramatic when sweet corn is held or transported at higher temperatures. For example, sugar loss is four-times greater at 10 degrees C (50 degrees F) than at 0 degrees C (32 degrees F). Under optimum conditions, market life for sweet corn can be more than 14 days.

CA consideration: Extensive research on extending market life of sweet corn, to allow for long transit times by sea, resulted in findings of no benefit.

Post-harvest pathology: Decay is not usually a serious problem but when present it is found on the husk and silk. Strict control of sanitation and temperature management can minimize decay which is mainly caused by *Alternaria alternata*, *Fusarium moniliforme*, or *Mucor hiemalis*.

Quarantine issues: None

B. Grapefruit

Scientific name *Citrus paradisi* is a member of the Rutaceae family originating in the Caribbean. It is classified as a hesperidium, a kind of berry with a leathery rind that is divided into segments. Each segment contains hundreds of individual juice vesicles that comprise the majority of the edible portion of the fruit. Although Marsh White is the most common variety, pigmented varieties have become very popular in the marketplace.

Quality characteristics: high quality fresh-market grapefruit will have a turgid, smooth peel and be relatively blemish-free with a soft yellow skin color. It should be elliptical and firm with bitterness at a minimum.

Horticultural maturity indices: Sugar/acid ratio is the main determinant of maturity and harvest start up is dependent upon fruit samples reaching the specified ratio.

Grades and packaging: Marketable fresh grapefruit range from size 23 (23 fruit per 4/5 bushel carton) to 56 (56 fruit per 5/6 bushel carton). Grades are dependent on color standards and matters such as texture, skin blemishes, shape, and firmness. Grapefruit, being a non-climacteric fruit does not exhibit a classic ripening pattern of increased respiration and ethylene production.

De-greening is normally used when marketing early-season fresh grapefruit from production areas where night temperatures are high. The de-greening process introduces ethylene gas into chambers containing the otherwise ripe, but green-skin fruit at a fixed temperature and relative humidity, a result of which is a yellowing of the skin for market acceptability.

Pre-cooling conditions: Pre-cooling is not needed for fresh grapefruit.

Optimum holding and transport conditions: Following grading/sorting/packing, they are typically held and transported at 12 to 15 degrees C (53.6 to 59 degrees F) with 95 percent RH. A natural wax coating that incorporates fungicides for decay control is applied at time of grading/sorting/packing to reduce water loss through the peel. To minimize fruit pitting, cooling to 10 degrees C (50 degrees F) must be done rapidly at 95 percent RH and maintained during holding and transit at 5 to 8 degrees C (41 to 46.4 degrees F). At optimum holding temperatures, fruit respiration rates are reduced and quality maintained up to 42 days, making sea shipping a possibility to even the farthest markets. An example of this is the huge movement of fresh Florida grapefruit to Japan over several months every year. Even with a three-week transit time, the Japanese importers typically hold fruit in storage for a few weeks awaiting a surge in market demand with higher profits than normal.

CA consideration: Although research shows some benefits to certain varieties under various growing conditions, controlled atmosphere has not become an economically viable commercial consideration.

Post-harvest pathology: Decay is most prevalent in fresh grapefruit. Decay organisms fall into two categories: those that result from infection of the fruit before harvest (stem end rot, *anthracnose*, and brown rot) and those that develop through wounds caused by harvesting or handling abuse (blue mold, green mold, and sour rot). *Diplodia natalensis* is prevalent in early season fruit when temperatures are high and de-greening has been used. *Phomopsis citri* is more common during the winter months. *Alternaria citri* is a less aggressive fungus that can exist in over-mature grapefruit and those in extended storage warehouses. *Anthracnose* is a minor problem with late-season fruit. Brown rot caused by *Phytophthora citrophthora*, appears more frequently in mature fruit and fruit stored for extended periods. Green and blue mold, caused by *Penicillium digitatum* and *italicum*, respectively, invade fruit through wounds made during harvesting handling. Drenching grapefruit with thiabendazole (TBZ) is recommended to control most of the conditions described above. An alternative is to add TBZ to the natural wax at time of packing. An especially clean pack-house will reduce the likelihood of spreading the occasional bad fruit's problems further.

Quarantine issues: In growing areas infested with quarantine insects such as tropical fruit flies, cold treatment is an approved quarantine treatment in the United States. However, fruit must first be pre-conditioned in order to withstand the rigors of cold treatment. At time of this manual the

regulation on cold treatment of grapefruit is being revised to adjust the steps to be taken. This revision is necessary following a disastrous event where South African grapefruit were found to be infested with live fruit fly larvae even after the required cold treatment protocol was successfully concluded.

Suitability as a fresh-cut product: the potential for grapefruit as a fresh-cut product or as packaged sections is great. Peeled and sectioned grapefruit is becoming popular with consumers since technological developments have overcome the several problems that were unsolved for so long. Developing countries wanting to export grapefruit to the United States, Canada, and Europe would be well-advised to move into further processing at origin in order to tap into this growth potential, thereby eliminating the complicated processes and high risks that fresh grapefruit face when tapping into new markets for them.

C. Melons

Scientific name *Cucumis melo L.* include honey dew, casaba, Crenshaw, and canary varieties, a running herb of the Cucurbitaceae (gourd) family, grown for its sweet, flavorful fruits. Popular netted melons are: cantaloupe or muskmelon, Charentais, Galia, Ananas, Persian, and Western Shipper.

Quality characteristics: minimum quality standards for melons are firm, well-formed, mature, free of aphid stain or rust spot, bruises, broken skin, sun scald/sunburn, hail damage, moisture loss, insect damage or growth cracks, often including a stated standard for sweetness. A full-slip (abscission) melon is considered by consumers to have superior flavor, texture, and sweetness.

Horticultural maturity indices: Melons are ready to eat when the skin surface feels waxy and the blossom end is slightly soft to the touch, with a pleasant aroma.

Grades and packaging: In the U.S., melon grades include: U.S. Fancy, U.S. No. 1, U.S. Commercial, and U.S. No. 2, the difference based primarily on the percentage of fruit that meets decay, damage, and disease tolerance standards. Size classification is determined by the number of fruit which can fit into a carton to achieve a weight of 14.6 kg (30 lb.), known as 4's, 5's, 6's, 8's and 9's. For netted types of melon, the size standards are 9's, 12's, 15's, 18's, 23's and 30's based on volume in an 18 kg (40 lb.) package. Marketing of melon slices and cubes is gaining in popularity with the food service trade especially, and future expansion of processed fruit into retail is an increasingly strong opportunity for developing countries. This processing avoids the phytosanitary requirements of importing countries. In the case of exports to the U.S., the USDA-APHIS requirements drop away, being replaced by those of the FDA.

Pre-cooling conditions: Melons need not be pre-cooled following harvest unless they are full-slip, in which case pre-cooling to 10 to 15 degrees C (50 to 60 degrees F) is used to slow the rate of ripening. Both hydro-cooling and forced-air cooling are preferred methods, the former being more efficient.

Optimum holding and transport conditions: Holding and transporting at 10 degrees C (50 degrees F) with 90 to 95 percent RH is recommended, producing a market life of 7 to 10 days. Use of amino acid-chelated calcium rinse or soak prior to grading can extend market life of full-slip

melons. Reduction of moisture loss during transport can be aided by use of linerboard inside cardboard shipping cartons.

CA consideration: CA has negligible effect on melons.

Post-harvest pathology: Occasionally, bacterial brown spot, infested by *Pantoea ananatis* (*Erwinia ananas*), *Alternaria alternata* and *Cladosporium cucumerinum* rots can be found as a result of chilling injury, punctures, or holding too long in storage. Crushing and bruising caused by severe, rough handling from field to pack-house can result in unacceptable product quality in a matter of hours. *Fusarium* rot is the most common disease, causing large fissures and an enlarged dark net at the lesion site. Rot is suppressed with hot water dip containing fungicide.

Quarantine issues: Disinfesting of external (hitchhiking) insects must be done at origin to meet phytosanitary requirements. Methyl bromide has been the treatment of choice for many years, but as a result of the Montreal Protocol is now being phased out and getting very expensive.

D. Mango

Scientific name *Mangifera indica L.* is a widely popular fruit in most countries. There are dozens of varieties, with "Tommy Atkins," "Haden," "Kent," and "Keitt," being most common in international trade. Skin color and shape easily identify a variety.

Quality characteristics: Most common quality parameters are skin color, size, shape for variety, appearance, freedom from defects and decay, absence of fiber in the flesh and lack of turpentine-like flavor. Some varieties, such as "Haden," have pinhead-size black spotting that is not regarded as a defect.

Horticultural maturity indices: In general, the measure of maturity for most cultivars of mango is when the fruit shoulder has risen above the stem end and there is a slight skin color break. Other indices are number of days after blooming, sugar content and specific gravity.

Grades and packaging: There are no U.S. or international grade standards for mango. Mango is sold in 16 kg (35 lb.) cartons but mostly in 6 kg (14 lb.) flat single-layer cartons and 4.5 kg (10 lb.) fiberboard boxes with various counts. Peeled and cut mango in special plastic film bags is becoming very popular in food service and in retail in major markets. Cutting fruit at origin, under good hygienic practices and HACCP can obviate the strict phytosanitary requirements of plant protection and quarantine authorities.

Pre-cooling conditions: Fruit is normally forced-air cooled, preferably within 24 hours after harvest.

Optimum holding and transport conditions: A shelf-life of 14 to 28 days can be expected for mature green fruit, so long as 10 to 13 degrees C (50 to 55 degrees F) is protected at 85 to 90 percent RH. Upon arrival at destination, further ripening can be achieved at a temperature of 20 to 23 degrees C (68 to 73.4 degrees F). Already ripe fruit should be held at a slightly lower temperature of 7 to 8 degrees C (44.6 to 46.4 degrees F). The use of ethylene gas as a ripening agent is not recommended.

CA consideration: Research literature should be studied before using CA on mangos. A wide variety of favorable/unfavorable responses exist, due to varietal differences.

Post-harvest pathology: *Anthracnose (Colletotrichum gloesporioides)* is a pre-harvest infection and does not spread post-harvest. It is the leading cause of reduced fruit quality, first appearing as black spots/streaks, then as black sunken spots. *Alternaria* rot (*Alternaria alternata*), another pre-harvest infection, is sometimes a problem. Post-harvest wound infections such as black mold (*Aspergillus* spp.) and transit rot (*Rhizopus* spp.) can be severe upon arrival at destination. There are some quite successful treatments, both pre-harvest and post-harvest, that prevent these problems from developing. The research literature is full of many simple steps that work.

Quarantine issues: Mango is a tropical fruit fly host and sometimes a seed weevil host. Mitigation methods in use are: hot water dip, vapor heat treatment, methyl bromide and irradiation processing. Of the four options, irradiation processing is the most practical and inexpensive when the fully-allocated cost of lost/damaged, unmarketable fruit is considered in evaluating the first three options.

E. Paprika and Chili Peppers

Scientific name *Capsicum Annul, L.* is a warm season crop that is a member of the Solanaceae family. Peppers in the same family are bell peppers, chili, pimiento, aji, pimiento, and capsicum and they can be sweet, mild, strongly pungent or very hot, determined by capsaicin content. Hungarian paprika is very famous internationally because it is very pungent.

Quality characteristics: since paprika is processed into powder, the normal fresh quality considerations are of no value. Misshapen and otherwise rejected pods can be used in the processing of powder and oil. As for chili peppers, quality is determined by shape, size and color typical of the variety, with firm flesh, relatively free from defects such as cracks, sunburn or decay. Peppers that are shriveled and dull-looking should not be shipped.

Horticultural maturity indices: Peppers are always picked by hand for the fresh market. Mechanical harvesting can be used when pimiento is to be processed into powder. Experienced workers can determine the ripeness character. The pimiento peppers used for paprika powder are dried and allowed to equilibrate in moisture content. Pods may be sliced in order to shorten drying time, to improve color and flavor.

Grades and packaging: There are no grades established for paprika. There are no grades for chili peppers. Internationally-recognized size standards are: Small, Medium, Large and Extra Large/Jumbo. Most often, they are packaged loose in flat corrugated cartons containing 5 kg (11 lb) with one or two layers of fruit.

Pre-cooling conditions: Not applicable

Optimum holding and transport conditions: Ground paprika can be stored without refrigeration in air-tight containers.

CA consideration: While awaiting processing, fresh pimiento can be held in CA under low

oxygen to retard ripening and respiration for 21 to 35 days at 5 degrees C (41 degrees F) without quality loss.

Post-harvest pathology: Diseases which can attack fresh pimiento prior to processing into paprika are: *Botrytis* gray mold, *Alternaria* black rot, and soft rots of fungal and bacterial origin. The best control method is to hold peppers at 5 degrees C (41 degrees F) until processing begins. Wash water sanitation is a very important consideration. Pests such as virus, insect and nematodes that affect tomatoes can also infest pimiento in the field.

Quarantine issues: None

SECTION XII

Customs Duties, Harmonized Tariff Code, and Special Legislation

The "landed" cost of goods sold in international trade include:

- Selling price, which includes the cost of production, harvesting, sorting/grading, packaging
- Required documentation, such as export permit, phytosanitary certificate, transport waybill
- Origin land transport
- Origin port charges
- Ocean transport
- Destination port charge;
- Customs duty

International Terms of Sale are specified in an International Chamber of Commerce (ICC) document that includes every possible option for transferring title to goods between buyer and seller. These terms of sale can be specified in the offer/acceptance between buyer and seller. When banks are used by the seller and buyer to represent them in the transfer of funds, the most frequently used financial vehicle is the Irrevocable Letter of Credit. These terms are found in an ICC booklet which is likely to be available from a freight forwarder.

The selling terms of a specific shipment can provide for transfer of title at any point in the movement of the goods — either at the packinghouse, at the port of loading, at the port of destination or delivered to importer's warehouse.

The Harmonized Tariff Product Code (HS Code) is the international system for product identification and classification, listing standardized descriptions which represent all products involved in international commerce. Food and Agriculture is one of the nine sections. This is a rather obscure document to access from the Internet and required downloading of too much unrelated detail. In January 2004, simplified software technology is available for accessing only data which is commodity-specific. Worldwide distribution rights, patented by the International Trade Foundation, are available from CentradeX of Nashville, Tennessee.

For specific markets, the Harmonized Tariff Product Code is replaced with unique legislation to encourage trade. The American AGOA legislation allows certain agricultural commodities and processed foods to enter the American market duty free. For Canadian destinations, normal duties apply. In Europe, the ACP legislation allows duty-free status from southern African countries. These special duty-free arrangements are often seasonal only or are subject to a maximum volume quota from each origin.

Some examples of HS Codes are:

1. Vegetables, leguminous (peas, beans), shelled or unshelled, fresh or chilled 070800000000
2. Vegetables, other, fresh or chilled 070900000000

3. Vegetables, leguminous (peas, beans), shelled or unshelled, Peas	071021000000
4. Vegetables, leguminous (peas, beans), shelled or unshelled, Beans	071022000000
5. Vegetables, other	071080000000
6. Vegetables, other, single (frozen)	071080201900
7. Vegetables, mixture of	071090000000
8. Cut flowers, of a kind suitable for bouquets or for ornamental purposes, fresh, dried, dyed, bleached, impregnated or otherwise prepared	060300000000
9. Cut flowers, fresh	060310003200
10. Other flower species, cut flowers, fresh	060310003290
11. Other flower species, cut flowers, dried	060390003499
12. Grapefruit, fresh or dried	080540000000
13. Grapefruit, fresh	080540403800
14. Grapefruit and oranges (includes sections)	200830209801
15. Edible nuts, peanuts (ground nuts), raw	120210408105
16. Edible nuts, peanuts (ground nuts), raw	120220408105
17. Roasted and dried peanuts	200811208001
18. Peanuts otherwise prepared	200811208003
19. Mango, fresh or dried	080400000000
20. Guavas, mangoes and mangosteens	080450000000
21. Guavas, mangoes and mangosteens (fresh)	080450403800
22. Melons and pawpaws, fresh	080700000000
23. Melons, other than watermelons, fresh	080719000000
24. Muskmelon, fresh	080719000100
25. Honeydew melon, fresh	080719000101
26. Other muskmelon, fresh	080719000199
27. Other melon, fresh	080719999900
28. Pepper of the genus pimenta, dried or crushed or ground	090400000000
29. Fruits of the genus pimenta, dried or crushed or ground	090420000000