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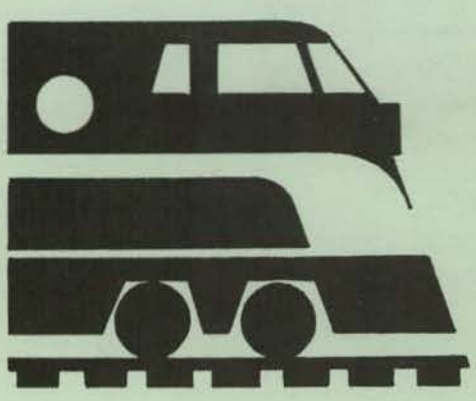
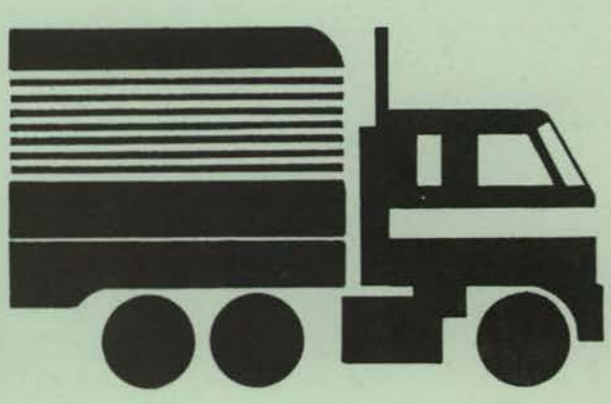
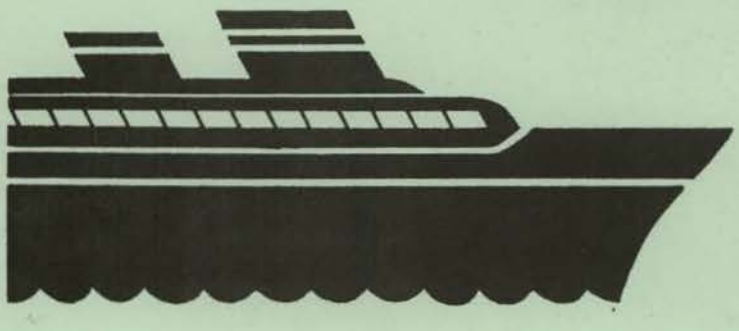


Export Guide for Idaho Fruits and Vegetables



Richard C. Casper, John K. Fellman, & James R. Jones



University of Idaho
Cooperative
Extension System
College of Agriculture

Preface

This guide provides resource information for current and potential exporters of fruits and vegetables produced in Idaho. The information is based on research conducted on actual shipments of produce overseas. The guide is intended as a resource manual and not as a comprehensive documentation of export methods or regulations. This publication includes general introductory information for novice exporters, special considerations for shipping perishables, and the addresses of organizations and companies that can provide more information. Use of specific firm names does not imply approval or disapproval of the firms or their services by the University of Idaho Cooperative Extension System.

Contents

Preface 2
Section 1 — Introductory information
Entering the export market 3
Selecting a target market 3
Knowing your customer 3
Introducing the products to potential foreign buyers 3
The importance of quality 3
Phytosanitary restrictions and other barriers to trade 3
Transportation of produce to overseas markets 4
Insurance 4
Methods of financing 5
Documentation 5
Section 2 — Factors in storage and shipment of perishable commodities
Preharvest considerations 6
Harvest conditions 6
Postharvest conditions 6
From the field to the consumer 7
Pre-cooling 7
Packing, storage, and transit environment 7
Sanitation and produce treatments 7
Water loss and relative humidity 7
Packaging and labeling 7
Transit environment 7
Transit mode selection 8
Additional precautions and measures 8
Summary 8
Appendices
Appendix A — Information resources 9
Appendix B — Load compatibility groups 11
Appendix C — Produce sensitivity to ethylene, freezing, and odors 13
Appendix D — Handling specifications for selected commodities 15
References 16

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Export guide for Idaho fruits and vegetables

R. C. Casper, J. K. Fellman, and J. R. Jones

Section 1 — Introductory information

Entering the export market

Domestic markets are often saturated at periods of peak production, and new market outlets are needed to absorb excess supply. Export markets provide the necessary market clearing outlet and provide opportunites for extra income for Idaho producers. However, entering the export market for the first time is no simple proposition. Doing business in the global marketplace involves business practices different than those developed for the domestic market. Establishing an international market for a product requires commitment and preparation on the part of the producer.

Commitment to exporting requires patience, tenacity, and a willingness to spend time and money gaining background information on potential foreign markets. International ventures should not be impulsive, improvised endeavors.

Preparation involves research and planning, and is essential to success overseas. Overseas customers appreciate a knowledgeable, consistent supplier who respects their way of doing business. The payoff for being prepared and doing business effectively is lasting business relationships between producers and their international buyers.

Selecting a target market

Once the necessary commitments and preparations are made, a target market needs to be identified. A target market is determined by identifying a window of opportunity for the success of a particular product in a particular country or locale within that country.

Finding the best place to establish a market makes good sense, but is not necessarily easy because information on international markets is often difficult to find. However, several sources of information are listed in Appendix A: Informaton Resources.

Knowing your customer

Lasting impressions are left on international customers by suppliers who understand and respect the cultural and business practices of their country. This may mean a change from traditional methods of doing business and a change of attitude on the part of the producer. International success requires knowing your customer and using that knowledge to win over buyers and establish relationships of trust and goodwill.

Knowing the language is a valuable asset, but it is not necessarily required. Yet, knowing a few phrases sometimes helps break the ice and shows the buyer that you have spent some time getting to know more about them.

Introducing the product to potential foreign buyers

There are several low-cost ways to find potential buyers. The Foreign Agricultural Service of the USDA provides many services to exporters interested in finding customers overseas. Among these services are buyer's lists of overseas agricultural importers, trade shows and exhibitions, and technical support for exporters. Trade shows and exhibitions are good ways to introduce a product to a great number of potential customers at one time.

The Idaho State Department of Agriculture, International Trade Division, can also provide many services and support for marketing products overseas. Appendix A lists appropriate addresses and phone numbers.

The importance of quality

Only the best quality produce should be sent to foreign buyers. Produce sent overseas represents not only the producer, but the state and region in which it is grown, as well as the United States. One shipment of lesser quality or improperly handled produce could severely damage the trade relationship developed with that customer and perhaps with other customers in the same country. Every precaution should be taken to ensure that high quality, properly handled produce reaches the final destination in satisfactory condition. Remember, there will only be one first chance to impress the foreign customer with the quality of produce from Idaho.

Phytosanitary restrictions and other barriers to trade

Price and quality are the two primary factors international buyers consider when shopping for produce. In addition, many countries severely control produce

entering their borders by using strict phytosanitary regulations. Such regulations require treatments that often are not seen as necessary in the domestic market. For instance, Japan requires an extra treatment on imported Northwest cherries to ensure the lack of codling moth, which typically infests apples, but not cherries. Japan justifies this regulation as necessary because cherries are often grown near apples in the Northwest. From the point of view of the United States, the regulation is an unecessary technical barrier to trade; cherries typically do not carry the codling moth larvae. Despite efforts to change these regulations, they remain in place, adding extra costs to prepare shipments of cherries to Japan. Ultimately the amount of tonnage shipped is reduced because a higher price is placed on the produce to cover costs.

An exporter should be aware of the phytosanitary restrictions of the country they are shipping to and comply with them, even if they are not perceived as necessary. Sources to contact about the requirements of particular countries can be found in Appendix A.

Japan also uses selective import licensing as a form of trade barrier. Licenses are issued freely for the import of some commodities, while entry of restricted commodities is limited by the issuance of relatively few import licenses.

Other more commonly known barriers to trade are duties or a tax on imports that deter the free flow of trade. There are three types of duties: (1) an *ad valorem* duty, assessed in proportion to the value of the import; (2) a specific duty, levied on a basis other than value; and (3) a combination of both. Appendix A lists the address of the International Trade Policy Division of the Foreign Agricultural Service, which is the best source of updated information on the import policies of specific countries.

Transportation of produce to overseas markets

For most produce exporters, the most practical method of getting produce to the destination market is through the services of freight forwarders. A freight forwarder makes the arrangements for ocean or air transport together with all other necessary arrangements for expediting the shipment to the final destination. Often, using a freight forwarder costs less than making all the arrangements personally because they have experience and know which documents and procedures to use. They can also consolidate shipments to reduce the unit shipping cost to small shippers.

The forwarder also arranges for cargo insurance, makes the necessary overseas communications, and advises the shipper on requirements for package marking and labeling. The forwarder receives fees from the exporter as well as a percentage of the freight charge from the carrier. The fees generally consist of an agreed upon amount together with documentation charges.

An export freight forwarder must be licensed by the U.S. Federal Maritime Commission to handle ocean freight and by the International Air Transport Association to handle air freight. It is wise to ask for and check references from a forwarder before hiring their services. The names of reputable freight forwarders can usually be obtained from other exporters or the International Trade Division of the Idaho Department of Agriculture.

Although many of the procedures for shipping are dealt with by the freight forwarder, it helps to understand many of the functions they perform. This knowledge can help the exporter in planning production, cultural practices, harvesting and storage methods, and selling and shipping. Information on costs of documentation, financing, and shipping can be obtained from carriers and port authorities. Agencies within the state and federal governments who monitor the international movement of goods are also good sources of information.

Exporters desiring more than freight forwarding services can use an export management company. Many companies offer services such as marketing and financing in addition to freight forwarding. For more information, contact the Idaho Department of Commerce, listed in Appendix A.

Insurance

Marine insurance is usually provided by the freight forwarder at the request of the exporter. Transport by sea can be hindered by natural disasters and human error. A delay of the vessel could result in substantial quality loss. However, insurance companies are reluctant to underwrite policies for perishable goods because of the potential for losses despite efforts made by the carrier. The only coverage available for chilled, frozen, or otherwise refrigerated cargo (including modified atmosphere) is insurance for marine risks.

Risks insured against by marine insurance include: perils of the sea; fire and explosion; collisions and stranding; assailing, thieves, and deliberate mishandling; latent defects of the vessel; failures due to errors in management of the vessel; and general average (damage to the ship or cargo) and salvage charges. The coverage also protects goods while on shore against the following: fire, lightning, sprinkler leakage, and explosion; hail, flood, earthquake, and windstorm; landslide, volcanic eruptions, and avalanche;

and damages caused in unloading, such as when a dock sinks or the cargo is damaged during unloading by stevedores.

Specialized insurance can be obtained that provides coverage against deterioration losses caused by mechanical breakdown of the refrigeration equipment, on the condition that the breakdown has lasted for more than 24 hours. Only partial loss of refrigerated goods are payable in event of sinking, stranding, fire, or collision. Produce that is not in mechanically refrigerated containers cannot be insured against deterioration, regardless of the cause. Freight forwarders are the best source of information regarding insurance questions.

Methods of financing

Table 1 lists several options for payment of international trade. One method, a full-service bank with international offices, is a great convenience to exporters. Such a bank can assist the exporter in many financial matters and reduce the risks of doing business internationally.

Another source of financial assistance for medium-term financing is the Commodity Credit Corporation's Export Credit Guarantee Program (GSM-102). The program operates in cases where credit is necessary to increase or maintain U.S. exports to a foreign market and where private financing institutions would be unwilling to provide financing without CCC's guarantee. In most cases, U.S. banks provide financing, making it possible for foreign buyers to purchase on credit terms for up to 3 years. The CCC considers all requests under the GSM-102 program on a case-by-case basis. For more information or to submit a request for entrance into the program contact the CCC at the address listed in Appendix A.

Whatever financing method for international transactions is used, careful study and planning should be applied to finding the best method for each exporter. The exporter must make arrangements for financing before preparing the necessary documentation.

Documentation

Preparing documentation for shipment of fresh produce can be complicated. Until an exporter becomes more familiar with the process, it is recommended that the freight forwarder handle the necessary documentation. Forwarders are very familiar with the documents and have the experience necessary to prepare them properly.

The average international shipment involves 45 separate documents. Information is constantly transferred from one document to another. In addition, many countries require specialized forms or certificates. Proof of marine insurance is usually required with other documentation when preparing for export. Freight forwarders together with the district office of the Idaho Department of Commerce are the best sources of information and aid in knowing what documentation is required by specific countries.

Table 1. Methods of payment commonly used for cash sales or short-term credit.

Method	Description
Cash sales	Payment is made before goods are shipped by the exporter.
Letter of credit	The buyer requests his or her bank to open a credit in favor of the exporter for an amount (in U.S. dollars) equal to the total value of the shipment. The foreign bank instructs its U.S. correspondent bank to notify the exporter that the letter of credit (L/C) has been established and authorizes the U.S. bank to pay the exporter when compliance with all the documentary requirements as stipulated in the letter of credit has been verified. Most letters of credit are irrevocable and confirmed by a U.S. bank, which minimizes risk to the exporter.
Cash against documents (c.a.d.)	U.S. confirming houses acting as bankers for their overseas clients will pay the exporters.
Open Account	Open account terms are extended only to excellent credit risk customers residing in countries that have no exchange restrictions. The exporter usually carries the financing on the basis of 90 to 120 days. This method is used only when the seller is dealing with a well-known buyer.
Factoring	A factor is a large financial house or commercial bank that takes over the granting of credit and collection of receivables. The seller is paid on the receipt of invoice or is made advances for facilitating production. Factoring permits are sold on open account direct by the manufacturer to clients abroad without running financial risk. Costs run from 1 to 2 percent on average monthly balances outstanding plus interest at normal rates if advances are made.
Consignment shipments	These provide for deferred payments and indirectly involve financing. Such shipments are usually made under an agreement that no payment is due the consignee. This means that the U.S. exporter is able to have goods readily available and on display in a non-U.S. market and yet the agent need not pay for the goods until they are sold. Shipments are limited to agents and to intercompany branch shipments.
Documentary draft	A draft is an unconditional order in writing signed by the exporter and addressed to the importer "ordering him to pay on presentation of the instrument at some specified future date the amount of the draft." Drafts can be transferred from one party to another by simple endorsement.

Source: Nicholas 1985.

Section 2 — Factors in storage and shipment of perishable commodities

Preharvest considerations

Varietal selection should be made with international customers in mind because many foreign buyers specify the particular variety wanted when buying from U.S. producers. Optimum shipping temperature also depends on the variety grown and should be a consideration in selection.

Cultural practices should allow the genetic potential of the selected variety to manifest itself in the production of the highest quality produce. Quality cannot be improved after harvest, only maintained. The marketable life of the product after harvest is therefore directly dependent upon quality and optimal maturity at harvest.

The optimal point of maturity at which harvest should occur varies with the type of commodity and even among cultivars. Undermature produce will not ripen or be of good quality at the time of sale. Overmature produce deteriorates rapidly and may not reach the terminal destination in marketable condition. The transit environmental requirements are therefore influenced by the maturity of the product.

Harvest conditions

The time of day that harvest occurs is related to ambient field temperature and humidity at harvest. In general, a cooler time of day when humidity is lower is the best time to harvest. Many times, this means in the morning, after dew has evaporated.

Fruit or vegetables with mechanical injuries, skin breaks, and bruises should be culled. These injuries expedite decay and lessen the appeal of the product. Before and during harvest, diseased or decayed plants or fruit should be removed to reduce the chance of further inoculation of disease organisms. The possibility of loss of an entire container or shipment exists if injured or decayed tissue is allowed to be shipped with good produce.

Postharvest conditions

It is most important to remember that fruits and vegetables are living tissue and deterioration starts at the time of harvest. Physiological breakdown of plant products is due to the natural ripening and aging process. This process includes factors such as respiration rate, ethylene production, and invasion by pathogens.

Respiration is the process by which carbohydrates, proteins, and fats are broken down into simple end products with a release of energy (heat). Respiration requires oxygen, which is used in breakdown of stored food reserves and then converted into carbon dioxide. As more and more stored food reserves are broken down, senescence (aging and deterioration) is hastened. Food value of the product is decreased and flavor quality is lessened by senescence. Thus, the rate at which respiration takes place determines a product's postharvest life (perishability).

Dried fruits and nuts have very low respiration rates. Apples, garlic, grapes, onions, potatoes (mature), and sweet potatoes have a low rate. Cherries, plums, peaches, pears, and immature potatoes respire at a moderate rate. Commodities with high respiration rates include blackberries, strawberries, and raspberries. Snap beans, green onions, and cut flowers have very high rates while broccoli, mushrooms, sweet corn, and peas have the highest respiration rates.

Ethylene is the natural aging and ripening hormone and is produced by all tissues of higher plants and some microorganisms. It is a gas and is commonly found in the environment. The effect of ethylene can be both beneficial and detrimental to plant products. It either improves product quality by promoting more uniform and faster ripening or hastens senescence and reduces marketable life. Products that produce high amounts of ethylene should not be stored or shipped with products that produce relatively low amounts. (Appendix B includes more information on compatibility of mixed loads during transit.) Exposure to ethylene can do irreparable damage to many fruits and vegetables. Loss of color and flavor, and increased deterioration rates are the result of ethylene damage. Sources of ethylene include ripening fruits, ripening rooms, internal combustion engines, aircraft exhaust, florescent light ballasts, decomposing produce and fungi, cigarette smoke, rubber materials exposed to heat or ultraviolet light, and virus-infected plants.

Ethylene production varies among commodities. Products that are known to produce high rates of ethylene include apples, apricots, peaches, pears, and plums. Some produce with low ethylene production rates are grapes, potatoes, strawberries, blueberries, raspberries, and cucumbers.

Many pathogens produce their own ethylene. When produce becomes inoculated with these organisms, particularly fungi, the plant's own ethylene coupled with that produced by the invading organism expedites respiration, and the breakdown of tissue happens much faster than normal. Harvesting, packing, and transit of the product should be well planned and performed without damage to the product. Pathogenic invasion is less likely when produce is not damaged.

Some commodities are susceptible to damage by freezing. Odors produced by some commodities will be absorbed by others and cause off-flavors. Freeze

damage and odor absorption both render produce unfit for sale. For a list of ethylene sensitive, freezing sensitive, and odor sensitive commodities, see Appendix C.

From the field to the consumer

To extend the marketable life of the product, every necessary precaution should be employed to delay its senescence. Procedures that prove to be most helpful in prolonging the life of the product are relatively simple and cost-effective.

Pre-cooling

For most commodities, the first and most important step is removing field heat as soon as possible by pre-cooling the product before transit. Respiration and deterioration of the product are reduced by effective cooling before and during transit. The product temperature after pre-cooling should be as close to recommended transit temperature as possible.

Methods of pre-cooling include placing the product in shady areas directly after harvest, storage room cooling, vacuum cooling, forced-air pre-cooling, hydrocooling, and icing. The effectiveness of any of these methods depends upon the coolant reaching the product. Package or container design and arrangement of the produce in the package should be planned with cooling in mind.

Packing, storage, and transit environment

Refrigeration is the single most effective method of decreasing the deterioration rate of fresh produce. Equipment should be well maintained and kept sanitary. Control over the temperature of the product is vital because extremes of cold or heat can cause physiological damage to the product and render it unmarketable.

Sanitation and produce treatments

Packing house and transportation equipment should be kept sanitary by use of cleaning products that disinfect and deodorize. The use of bactericides, fungicides, fumigants to control insects, and waxing are valuable in curbing the deterioration of the product due to pest and pathogen invasion. Hormone and other chemical treatments can also be used to delay deterioration due to normal physiological processes. Information on restrictions and requirements for specific treatments can be obtained from the Idaho Department of Agriculture or the Foreign Agricultural Service listed in Appendix A.

Water loss and relative humidity

Produce starts losing water immediately after harvest. Excessive water loss results in loss of nutritional value. In most cases, consumers will not buy produce that has an undesirable appearance. Water loss is the greatest single cause of deteriorated appearance. Shriveling or wilting, softening, limpness, or loss of crispness and flavor are the results of excessive water losses.

Relative humidity, the temperature of the produce and its surrounding air, and air velocity all affect the rate of water loss. Therefore, water losses can be controlled by (1) maintaining high relative humidity (90 to 95 percent), (2) lowering the temperature, (3) providing only enough air movement to remove respiration heat, (4) waxing, (5) packaging in several semipermeable bags or film wraps, (6) maintaining the refrigeration coil only a few degrees lower than desired cargo temperatures (only on produce that is not susceptible to chilling injuries — see Appendix C for more information). Appendix D includes information on export specifications for major produce commodities grown in Idaho.

Packaging and labeling

Package size and material

Exporters should also be aware of the preferred package size of their foreign customers. The Organization for Economic Cooperation and Development (which includes the European Community, the United States, Canada, Chile, Japan, and many others) recommends the use of package sizes that meet metric package size requirements. The outside base metric measurement of packages that should be considered for export are: 400 by 300 millimeters (15.75 by 11.81 inches), 500 by 300 mm (19.69 by 11.81 inches), 600 by 400 mm (19.69 by 15.75 inches), and 600 by 500 mm (23.62 by 19.69 inches) (Nicholas 1985).

The most important factors to be aware of in selection of a material for packages used to export fresh produce are strength and moisture resistance. The most common shipping containers used for export packaging are fiberboard, wood, or veneer.

Labeling and marking

Markings on packages should comply to all laws and restrictions that apply to the destination country. In general, labels should be in the native language of the buyer. They should denote the common name of the product in that country, the size, count, metric weight, and variety of the product. A pictorial illustration of the product placed on at least two sides of the package will be universally understood and will aid in the proper handling of commodities at all phases of shipment.

Other considerations

Care should be taken that all packages are assembled and closed properly. Other concerns of foreign buyers include uniform sizing within a package, consistent weights and exact counts, grade standards, and package standardization.

Transit environment

All transportation equipment should be in good

working order, sanitary, and free from debris. Temperature should be well adjusted, and optimal transit temperature should be reached and maintained before and during loading. If loads are being mixed with other types of produce, make certain that loads are compatible (Appendix D).

Transport mode selection

Factors affecting the selection of transit mode include cost, time efficiency, and perishability of the commodity being shipped. Highly perishable products are generally the only products considered for air transport because of the high shipping cost. For moderate to less perishable products, ocean vessel is the most common mode.

When moving the product from shipper to air or ocean carrier, most shipments are loaded on truck or rail containers. For conventional reefer vans, there are special load patterns that need to be utilized to optimize the effect of refrigeration (more information concerning these patterns can be found in USDA Agricultural Handbook 699, *Protecting Perishable Foods During Transport by Truck*).

The use of specially designed van containers is recommended for fruits and vegetables, if they are available and economically feasible. These containers utilize reverse-flow or bottom-air delivery systems. These systems provide a number of advantages over conventional reefer van containers. Advantages are: (1) more rapid cooling, (2) better temperature control, (3) increased load densities, (4) greater load stability, (5) improved utilization of vehicle cube (space optimization), and (6) reduced handling and transport cost per unit of cargo (Nicholas 1985). Packages loaded in these vans should have matching top and bottom vent holes and be tightly stacked in uniform fashion to allow circulating air to pass upward from one package to another. All loads should be properly braced to protect each package.

High-tech intermodal containers incorporating bottom-air delivery refrigeration and controlled atmosphere capability are now available. Constant monitoring of load temperature, relative humidity, and atmospheric gas mix is performed by an on-board computer. The exciting potential of these containers is in extending the market life of perishable commodities, making possible shipments to markets that in the past were not considered feasible to serve. If shipped in an intermodal van container, the product never has to be handled again until it reaches its final destination.

In many cases, export shipments move as break-bulk shipments, meaning that they are moved from a van container to the cargo holds of ships or airliners. This method, although somewhat less costly than intermodal containers, provides more risk of theft, injury, or advanced deterioration due to human error. The perishability of the product determines the best decision in this regard. If the break-bulk method is used, the same considerations exist for loading patterns and cargo bracing as in conventional reefer vans. Exporters should always advise the ship's agent in writing concerning the perishability of the cargo and any special requirements or restrictions that need be considered to ensure safe arrival of the product.

Additional precautions and measures

Many considerations need attention when exporting that may not be relevant for domestic trade. The high perishability of fruits and vegetables require that all the above mentioned precautions be taken and considerations examined before shipment. In addition to those mentioned, special precautions for successful export shipping are necessary. The following are adapted from USDA Agricultural Handbook 593, *Export Handbook for U.S. Agricultural Products*:

If export shipments are transferred from one container (e.g., cargo hold) to another enroute: (1) Periodic condition inspections are mandatory. Deteriorated commodities should not be exported, but diverted to domestic outlets if warranted by condition. (2) Loading patterns and special instructions need to be emphasized to the carrier. Highway vans hold more than intermodal containers. Be sure an acceptable load size is predetermined.

For export shipments in general: (1) Phytosanitary certificates issued by USDA are necessary for perishable products to be cleared for entry. The certificate should accompany the shipment, or be in the hands of the receiver when the shipment arrives. (2) Be sure the receiver is familiar with the handling requirements of the commodity during distribution and merchandising. This is especially important when shipping to new customers, or when shipping a new commodity to regular customers. Unfamiliar handling instructions should be printed on the package. All labeling should be in the local language.

Summary

Exports provide feasible market alternatives for produce, particularly if domestic markets become saturated during peak production periods. Obviously, exporting perishable products is a complicated business activity. Attention to detail and impeccable quality are absolutely necessary. Once the details are attended to, exporting produce becomes a profitable venture. Potential exporters are encouraged to first employ a reputable freight forwarder or export management company. Then, if desired, exporters can venture out on their own once vital principles of export trading are learned.

Appendix A — Information resources

For more information on foreign market development contact:

Foreign Agricultural Service
Foreign Market Development
U.S. Department of Agriculture
Room 5091, South Building
Washington, D.C. 20250
Phone: (202) 447-4761

For buyers' lists and other information concerning the Trade Opportunity Referral Service, contact:

Export Trade Services Division
Foreign Agricultural Service
U.S. Department of Agriculture
Room 5935, Administration Building
Washington, D.C. 20250

Agricultural Information and Marketing Service
High-Value Products Division
Foreign Agricultural Service
Room 4951, South Building
Washington, D.C. 20250-1000
Phone: (202) 447-7103

For information on specific document requirements of the State of Idaho, phytosanitary requirements, or freight forwarders and other information, contact:

Idaho Department of Agriculture
International Marketing Division
2270 Old Penitentiary Road
Boise, ID 83702
Phone: (208) 334-3240
Fax: (208) 334-2879

For assistance to exporters who have physical and quality problems with their products, contact:

Market Quality and Transportation
Research Laboratory
Agricultural Research Service
U.S. Department of Agriculture
P.O. Box 8143
Fresno, CA 93747
Phone: (209) 487-5334

Fruit Research Laboratory
Agricultural Research Service
U.S. Department of Agriculture
1104 N. Western Avenue
Wenatchee, WA 98801
Phone: (509) 664-2280

Potato Handling Research Center
Agricultural Research Service
U.S. Department of Agriculture
Greenhouse
University of Maine
Orono, ME 04473

For more information on transit environment, temperature conditions, or costs of transporting produce, contact:

Office of Transportation
U.S. Department of Agriculture
Room 1405, Auditors Building
14th and Independence Ave., SW
Washington, D.C. 20250
Phone: (202) 447-3963

For more information on packaging and sanitary regulations, consult:

Transportation and Packaging Research Branch,
Office of Transportation
U.S. Department of Agriculture
Room 210, Bldg. 006
BARC-West
Beltsville, MD 20705
Phone: (301) 344-2815

Technical Office
U.S. Department of Agriculture
Building 1070
BARC-East
Beltsville, MD 20705
Phone: (301) 344-2651
Fax: (301) 344-4335

For more information on trade shows and exhibits, contact:

High-Value Products Division
Foreign Agricultural Service
U.S. Department of Agriculture
Room 4951, South Building
Washington, D.C. 20250-1000
Phone: (202) 447-3031

For more information on tariffs, duties, technical, and other restrictions on trade, contact:

International Trade Policy Division
Foreign Agricultural Service
U.S. Department of Agriculture
Room 5057, South Building
Washington, D.C. 20250-1000

Trade and Assistance Planning Office
Foreign Agricultural Service
U.S. Department of Agriculture
Room 5071, South Building
Washington, D.C. 20250-1000
Phone: (202) 447-3935

A list of export management firms may be obtained by contacting the Idaho Department of Commerce. Ask for the Idaho International Trade Directory.

Idaho Department of Commerce
700 West State Street
Boise, ID 83720
Phone: (208) 334-2470
Fax: (208) 334-2783

For information on Idaho's seaport, contact:

Port of Lewiston
F. Ron McMurray, Manager
1626 6th Avenue North
Lewiston, ID 83501
Phone: (208) 743-5531
Fax: (208) 743-4243

For additional information on carriers' service, rates, and costs, contact:

Interstate Commerce Commission
Bureau of Traffic
12th and Constitution Avenue NW
Washington, D.C. 20423
Phone: (202) 655-4000

Federal Maritime Commisison
Bureau of Ocean Commerce Regulation
1100 L Street NW
Washington, D.C. 20513
Phone: (202) 632-6878

Civil Aeronautics Board
1825 Connecticut Avenue NW
Washington, D.C. 20428
Phone: (202) 673-5017

For more information on the GSM-102 program, contact:

General Sales Manager, Export Credits
Foreign Agricultural Service
U.S. Department of Agriculture
Washington, D.C. 20250

Appendix B — Load compatibility groups

Group 1

Recommended transit conditions:

Temperature:
32°F to 34°F (0°C to 1.5°C)

Relative humidity:
90 to 95 percent

Atmosphere:
Normally used on berries and cherries only:
10 to 20 percent CO_2

Ice:
Never in contact with commodity:
Apples
Apricots
Berries (except cranberries)
Cherries
Figs (not with apples, danger of odor transfer to figs; also see Group 6a)
Grapes (see Group 6a)*
Peaches
Pears
Persimmons
Plums and prunes
Pomegranates
Quinces

Note: Most members of this group are not compatible with Groups 6a or 6b because ethylene production by Group 1 can be high and thus harmful to members of Groups 6a or 6b.

Group 2

Recommended transit conditions:

Temperature:
55°F to 65°F (13°C to 18°C)

Relative humidity:
85 to 95 percent

Ice:
Never in contact with commodity:
Avocados
Bananas
Eggplant (also see Group 3)
Grapefruit **
Guava
Limes
Mangoes
Mixed melons (casaba, crenshaw, honeydew, persian)
Papayas
Pineapples (not with avocados, danger of avocados' odor absorption)
Tomatoes, green
Tomatoes, pink (also see Group 4)
Watermelons (also see Groups 4 and 5)

Group 3

Recommended transit conditions:

Temperature:
36°F to 41°F (2.5°C to 5°C)

Relative humidity:
90 to 95 percent
Cantaloupes

Group 4

Recommended transit conditions:

Temperature:
40°F to 45°F (4.5°C to 7.5°C)

Relative humidity:
About 95 percent

Ice:
Never in contact with commodity:
Beans, snap
Lychees (also see Group 3)
Okra
Peppers, green (not with beans)
Peppers, red (if with green peppers, temperature adjusted toward top of range)
Squash, summer
Tomatoes, pink
Watermelons

Group 5

Recommended transit conditions:

Temperature:
40°F to 55°F (4.4°C to 13°C)
Ginger not below 55°F

Relative humidity:
85 to 90 percent

Ice:
Never in contact with commodity:
Cucumbers
Eggplant
Ginger (not with eggplant, see Group 7)
Grapefruit, Florida (after January 1) and Texas
Potatoes (late crop)
Pumpkin and winter squashes
Watermelons (temperature adjusted for other members of groups; see Groups 2 and 4)

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*Grapes: Compatible with other produce only if grapes are not fumigated with sulfur dioxide (SO_2) in vehicle and if no chemicals that release SO_2 are included in packages.

**Citrus fruits: Biphenyl, which is used as a fungicide on citrus fruits, may impart off-odors to other commodities. Oranges and tangerines: compatibility depends on source.

Group 6a

Recommended transit conditions:

Temperature:
32°F to 34°F (0°C to 1.5°C)

Relative humidity:
95 to 100 percent

Ice:
Never in contact with asparagus, figs, grapes, and mushrooms:
- Artichokes
- Asparagus
- Beets, red
- Carrots
- Endive and escarole
- Figs (see Group 1)
- Greens
- Leeks (not with figs or grapes)
- Lettuce
- Mushrooms
- Parsley
- Parsnips
- Peas
- Rhubarb
- Salsify
- Spinach
- Sweet corn
- Watercress

Note: This group, except for figs, grapes, and mushrooms, is compatible with Group 6b.

Group 6b

Recommended transit conditions:

Temperature:
32°F to 34°F (0°C to 1.1°C)

Relative humidity:
95 to 100 percent

Source: The Packer, 1991.

Ice:
Contact acceptable with all:
- Broccoli
- Brussels sprouts
- Cabbage
- Cauliflower
- Celery
- Horseradish
- Kohlrabi
- Onions, green (not with rhubard, grapes; probably not with sweet corn or mushrooms)
- Radishes
- Rutabagas
- Turnips

Note: This group is compatible with Group 6a, except for figs, grapes, and mushrooms.

Group 7

Recommended transit conditions:

Temperature:
55°F to 65°F (13°C to 18°C)

Relative humidity:
85 to 90 percent

Ice:
Never in contact with commodity:
- Ginger (see Group 5)
- Potatoes, early crop (temperature adjusted for others)
- Sweet potatoes

Group 8

Recommended transit conditions:

Temperature:
32°F to 34°F (0°C to 1.5°C)

Relative Humidity:
65 to 75 percent

Ice:
Never in contact with commodity
- Garlic
- Onions, dry

Appendix C — Produce sensitivity to ethylene, freezing, or odors

Ethylene sensitivity

Never transport or store fruits and vegetables that produce a lot of ethylene with products that are sensitive to it. Ethylene can cause premature ripening of some products and will ruin others. For example cucumbers and celery turn yellow in the presence of ethylene, while lettuce will turn brown. Potassium permanganate pads can be used to absorb ethylene during transit and storage.

Ethylene producers

Apples
Apricots
Avocados
Bananas (ripening)
Cantaloupes
Cherimoya
Figs
Guavas
Honeydew
Kiwifruit (ripe)
Mamey
Mangoes
Mangosteen
Nectarines
Papayas
Passionfruit
Peaches
Pears
Persimmons
Plaintains
Plums
Prunes
Quinces
Tomatoes

Ethylene sensitive

Bananas (unripe)
Beans (green)
Belgian endive
Broccoli
Brussels sprouts
Cabbage
Carrots
Cauliflower
Chard
Cucumbers
Eggplant
Kiwifruit (unripe)
Leafy greens
Lettuce
Okra
Parsley
Peas
Peppers
Spinach
Squash
Sweet potatoes
Watercress
Watermelon

Freezing sensitivity

Most sensitive
Commodities likely to suffer injury by one light freezing:

Apricots
Asparagus
Avocados
Bananas
Beans (snap)
Berries (not cranberries)
Cucumbers
Eggplant
Lemons
Lettuce
Limes
Okra
Peaches
Peppers (bell)
Plums
Potatoes
Squash (soft)
Sweet potatoes
Tomatoes

Moderately sensitive
Commodities able to recover from 1 or 2 light freezings:

Apples
Broccoli
Cabbage (new crop)
Carrots
Cauliflower
Celery
Cranberries
Grapefruit
Grapes
Onions (bulb)
Oranges
Parsley
Pears
Peas
Radishes
Spinach
Squash (hard)

Least sensitive
Commodities that can be lightly frozen several times without sustaining serious damage.

Beets
Brussels sprouts
Cabbage (storage)
Dates
Kale
Kohlrabi
Parsnips
Rutabagas
Salsify
Turnips

Source: The Packer, 1991.

Odor sensitivity

Never transport or store odorous products with products that will absorb the odors.

Odor produced by	Will be absorbed by
Apples	Cabbage, carrots, celery, figs, onions, meat, eggs, dairy products
Avocados	Pineapples
Carrots	Celery
Citrus	Meat, eggs, dairy products
Ginger root.	Eggplant
Grapes (fumigated with SO_2)	Other fruits and vegetables
Leeks	Figs, grapes
Onions (bulb)	Apples, celery, pears
Onions (green)	Corn, figs, grapes, mushrooms, rhubarb
Pears	Cabbage, carrots, celery, onions, potatoes
Potatoes	Apples, pears
Peppers (green)	Pineapples

Source: The Packer, 1991.

Appendix D — Handling specifications for selected commodities

Commodity	Transit postharvest life	Transit temperature		Relative humidity	Freezing point		Top and/or package-ice
	(days)	(°F)	(°C)	(%)	(°F)	(°C)	
Apples	90 to 240	30 to 40 (depending upon variety)	1.1 to 4.4	90 to 95	30	−1.1	No
Apricots	7 to 14	32	0	90 to 95	30.1	−1.1	No
Blackberries	2 to 3	31 to 32	−0.6 to 0	90 to 95	30.5	−0.8	No
Blueberries	10 to 18	31 to 32	−0.6 to 0	90 to 95	29.7	−1.3	No
Cherries:							
Sweet	14 to 21	30 to 31	−1.1 to 0.6	90 to 95	28.8	−1.8	No
Sour	3 to 7	32	0	90 to 95	29	−1.7	No
Corn (sweet)	4 to 6	32	0	95 to 98	30.9	−0.6	Yes
Garlic	90 to 120	32 to 34	0 to 1.1	65 to 75	30.5	−0.8	No
Grapes	56 to 180	32	0	85	29.7	−1.3	No
Onions (bulb)	30 to 180	32	0	65 to 70	30.6	−0.8	No
Onions (green)	7 to 10	32	0	95 to 100	30.4	−0.9	Yes
Peaches	14 to 28	31 to 32	−0.6 to 0	90 to 95	30.4	−0.9	No
Pears*	60 to 90	32	0	90 to 95	29.2	−1.6	No
Plums/prunes	14 to 28	32	0	90 to 95	30.5	−0.8	No
Potatoes:							
Early crop	56 to 140	50 to 60	10 to 15.6	90	30.9	−0.6	No
Late crop	56 to 140	40 to 50	4.4 to 10	90	30.9	−0.6	No
Raspberries:							
Black	2 to 3	32	0	90 to 95	30	−1.1	No
Red	2 to 3	32	0	90 to 95	30.9	−0.6	No
Strawberries	5 to 10	32	0	90 to 95	30.6	−0.8	No
Tomatoes:							
Mature-green	21 to 28	55 to 70	12.8 to 21.1	90 to 95	31	−0.6	No
Pink	7 to 14	46 to 50	7.2 to 10	90 to 95	31.1	−0.5	No

*Early Bartlett pears that are ripened in transit should be shipped at 55°F to 60°F.

Source: USDA, Agricultural Research Service. 1986.

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Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, LeRoy D. Luft, Director of Cooperative Extension System, University of Idaho, Moscow, Idaho 83843. We offer educational programs, activities, and materials without regard to race, color, religion, national origin, sex, age, or disability, in accordance with state and federal laws.

500, February 1993

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