In this competitive economy, access to pertinent information is critical for success in international trade. Although information about international trade abounds, it is difficult for many agribusiness firms to access specific information. The International Trade Information System (ITIS) provides agricultural exporters basic information about countries, trade, and commodities in Pacific Rim countries. ITIS uses an expert system and hypertext to provide quickness and power in information dissemination. It allows the user to control the information to be displayed and chooses the level of detail to view. Hypertext is used to explain terms, expand on questions, and provide more detailed information. © 1992 John Wiley & Sons, Inc.

American business is confronted with an ironic dilemma. In today’s information age, information abounds for agricultural exporters. However, many small and medium-size agribusinesses that could export their products are not doing so because of a lack of appropriate information on which to base planning and operating decisions. Agribusinesses often must wade through enormous amounts

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of information, much of which is irrelevant, to find specific information that is useful for their particular needs. To compound the problem, the specific needed information is often buried in many different sources. Putting information into an electronic form without organization and proper packaging does not necessarily alleviate the problem. In fact, it could exacerbate the problem. Thus, the real problem is not too much information, but rather how to obtain specific information when it is needed.

To help solve this problem, we developed the International Trade Information System (ITIS). In developing ITIS, we gathered vast amounts of information from various sources, analyzed and interpreted it, and integrated the details into a practical and easily usable form. Information was incorporated if it was available and deemed to be important to those interested in exporting. ITIS provides basic information about the people, markets, commodities, and policies in Pacific Rim countries so that exporters can better understand what products are needed to meet the demands of foreign consumers. The objective of this note is to introduce ITIS to agricultural exporters and would-be exporters.

WHAT IS ITIS?

ITIS is an information system that integrates relevant information and packages it into an easily understandable and usable form. We have collected information about international trade for five Pacific Rim nations—Japan, Taiwan, South Korea, Hong Kong, and Singapore. These countries were chosen because they have had rapidly growing economies and have become large markets for US agricultural products, including high-value food products. The information has been gathered from the US Department of Agriculture’s Foreign Agricultural Service and Economic Research Service, the World Bank, the United Nations, trade journals, foreign country sources, etc. The information includes an overview of each country and information on agricultural policy, production and consumption, major imports from the world and the United States, tariff and other trade barriers, export opportunities for US agricultural exporters, and changes in consumption patterns.

HOW WAS ITIS DEVELOPED?

ITIS was developed using KnowledgePro®, an expert system shell by Knowledge Garden, Inc. (Nassau, NY). Two advanced computer software technologies, an expert system and hypertext, were used to provide power and flexibility for the system. An expert system is a computer program which imitates problem-solving skills of human experts. Hypertext is a computer-based method of organizing pieces of information in which concepts are linked dynamically. The information can contain text, graphics, animation, video, sound, and other forms of computer data. Hypertext allows the user to quickly locate and display information intuitively and interactively. Using a mouse or the keyboard, the user controls the information to be displayed and chooses the level of detail to view.

Hypertext is used extensively in ITIS to expand ideas, explain terminologies, and provide additional information. For convenience, the information is organized so that each piece of information is displayed on one screen, because most
people dislike having to scroll down to read another screen. Any additional information, explanation, examples, or graphs are displayed in hypertext form.

The system consists of a series of program modules (also called knowledge bases), text files, graphic files, and other program files used by ITIS. The system was designed in modular form to meet memory requirements and to increase program speed. The modules call upon one another when the appropriate subject is requested by the user. From there, ITIS goes to the appropriate module and displays the information.

While ITIS was being developed, it was demonstrated to several people and organizations to help ensure that it would be of value. These organizations included the Foreign Agricultural Service, Extension Service and National Agricultural Library of the USDA, and the Small Business Administration of the US Department of Commerce. It was also demonstrated at the 1991 International Trade Development Centers conference in Washington, DC, and the 1991 Extension Technology Conference in Hershey, Pennsylvania.

WHAT ARE THE BENEFITS OF ITIS?

The main benefits of ITIS are:

- Easy to use—After the user starts the program, he or she can use a mouse or the keyboard to point to the topics or highlighted terms (i.e., hypertext) to view that information. There are no commands to memorize.
- Intuitive and interactive—Needed information can be found intuitively and interactively with the computer.
- No keywords to enter—Unlike full-text-search utilities that require the user to enter keywords, the user does not have to know any keywords to find the information.
- Speed of access—with just a few clicks of the mouse or strokes of the keyboard, the user can track down any topic in the ITIS document. The cross-referencing capabilities let the user move instantly from document to document to view related topics.
- Control of information displayed—The user is in control of the information display so that he or she can avoid irrelevant topics and choose the needed level of detail.

HOW IS ITIS ORGANIZED?

Currently, ITIS contains information on five Asian countries. For each country, the information is organized hierarchically, but a network structure is also used to add flexibility. For example, information on self-sufficiency in food production can be accessed from many places. The system consists of a main program and program modules for each country.

The main program is the initial module for ITIS. It displays a world map with the program title and the names of the authors. Then, a map of Asia with the five countries labeled is displayed. The user selects the country he or she wants to explore with the mouse or the keyboard. A map of the selected country is displayed followed by a main menu for that country.

The menu for each country lists the major subjects to be examined and runs
the appropriate knowledge base depending on the subject chosen from the menu. For purposes of illustration, Japan is used for discussion. After the map of Japan is displayed, the screen shows the main menu for Japan that consists of the following subjects:

- Overview
- Agriculture
- Imports
- Opportunities in the Eating-Out Industry
- Distribution Systems
- Strategies for Entering Markets
- Go Back, and
- Quit

The user can select any subject to study, go back to select a different country, or quit the program just by clicking the mouse on the subject.

**Overview**

The overview information consists of a general description of Japan as well as its economy, population, agriculture, forestry, land use, agricultural markets, and summary statistics. The user can view any topic by pointing and clicking a mouse on the topic. The user can also quit or go back to the main menu to select another topic.

**Agriculture**

Information on agriculture includes agricultural policy, production and consumption of major commodities, and consumption patterns. Under agricultural policy, major issues, goals, and policy instruments to attain the goals are included. The production and consumption topic contains information on self-sufficiency and historical trends of production and consumption of major commodities: rice, wheat, barley, peanuts, rapeseed, sorghum, soybeans, sugar, beef, pork, lamb, milk, and poultry. Changes in consumption patterns also are included in this module.

**Imports**

This module contains information on imports from the world and from the United States, opportunities for US exporters of high-value products, and trade constraints. Imports from the world as well as from the United States for major commodities are presented along with historical trends, competition from other countries, and market shares for 10 major commodities: beef, pork, offal, wheat, unsalted fish, shellfish, maize, cereals, lemons, and soybeans. US exporters can find information on opportunities in meat and meat products; fish and marine products; dairy and egg products; vegetables, coffee, and tea; oils and fats; candy, confections, and bakery goods; and many other products. Information on trade constraints contains includes tariffs, quotas, and quarantine regulations on major commodities.
Opportunities in the Eating-Out Industry

Information on opportunities in the eating-out industry contains an overview of the industry and information on consumption patterns, food service, beverage, and take-out sectors. The overview presents information on total sales of the industry by categories, the number of eating establishments, their size, their geographical concentration, and proprietorship of the establishments. Under consumption patterns, the user can explore how much consumers spend eating out, where they eat out, why they eat out, why they eat certain dishes, etc. The food service sector is divided into the following subsectors: restaurants, inns, and hotels; institutional foods; and specialty foods. The beverage sector includes information on pubs and beer halls, and coffee shops.

Distribution

This module provides information on Japan’s distribution system. Importers, wholesalers, and retailers are all highlighted. The user wishing to learn more about these subjects points the arrow on the words and clicks the mouse.

Strategies for Entering Markets

Here, the user can obtain information on how to start a business in Japan, suggestions for entering the market, how to find an agent or distributor, how to find an advertising agency, how to tailor their product to local market needs, how to determine market size, and many other useful tips for agribusiness. For each subject, more information is embedded in hypertext.

HOW TO USE ITIS

ITIS operates on an IBM PC, XT, AT, PS/2, or compatible computer with a hard disk. Although not necessary, it is recommended that ITIS be run on a 386 or higher machine with a mouse. An EGA or VGA color monitor is required.

To start the program, the user types the letters “ITIS” and then presses the “Enter” Key. After a world map and the title of the program are displayed, a map of Asia appears. This map is actually a menu for selecting a country to explore. By pointing the mouse to the country (Japan, in this example) and clicking the mouse, a map of the selected country appears. The map shows major cities, geographic features, and the total population of the country. By clicking the mouse or pressing the space bar to continue, the main menu shown in Figure 1 is displayed.

The user can point and click the mouse to select any topic to study, go back to select a different country, or quit. For example, if the user selects the overview, Figure 2 appears. Again, the user can select any topic by pointing a mouse on the topic or moving an arrow key to the topic and pressing “Enter.” If the user is not interested in any of the topics, he or she can select “GO BACK” to return to the menu in Figure 1.

Suppose the user selects “Agriculture” from the menu. The screen in Figure 3 appears. By selecting “Policy,” the user is presented with Figure 4. Selecting “Issues” will display information about major issues of Japanese agricultural
Japan is the largest export market for U.S. agricultural products. Which area would you like to explore?

Overview
Agriculture
Imports
Opportunity in the Eating-Out Industry
Distribution System
Strategies for Entering Markets
Go Back
Quit

Figure 1. Main Menu.

Which would you like to learn about?

About Japan
Economy
Population
Agriculture
Forestry
Land Use
Agricultural Market
Summary Statistics
Go Back
Quit

Figure 2. Overview Menu.

Which aspect of agriculture would you like to look at?

Policy
Production and Consumption
Consumption Patterns
GO BACK
QUIT

Figure 3. Agriculture Menu.
policy in Figure 5. Note that the term “self-sufficiency” is highlighted. It is in hypertext. By pointing and clicking on the term, more information will be revealed as shown in Figure 6.

Suppose we go back to the main menu in Figure 1 and select “Imports” to see what major commodities Japan imports and where they are imported from. By selecting “Imports,” the user is presented with a menu in Figure 7. Now, suppose that the user wants to know what commodities Japan imports from the world. By selecting the first topic, the user will see information in Figure 8.

In the box “Figure 1” (which is different from Figure 1 referred to in this paper), Table 101, and “Historical trends ... ,” “Competition ... ,” and “Market share ...” are all highlighted. This means more information is embedded in these terms and the user can select the term to find that information. The user can view what commodities and how much of those commodities Japan imported from the world by selecting “Table 101” or “Figure 1.” If “Figure 1” is selected, the bar graph will be shown (Fig. 9) which shows that the Japanese have a voracious appetite for shellfish.

If the user wants to see how much Japan’s imports of shellfish changed over time, he or she may select “Historical trends of major imports from the world” in Figure 7. Clicking the mouse on this topic will bring up a list of different commodities to choose from as shown in Figure 10. Clicking the mouse on “Shellfish,” the user can see a historical trend of shellfish imports as shown in Figure 11.

If the user wants to know where Japan imported the shellfish from, he or she can go back to the menu in Figure 8 and select “Competition from other countries.” The same list of commodities as illustrated in Figure 10 appears and the

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**Figure 4.** Policy Submenu.

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**Figure 5.** Information on Policy Issues.

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With about half the U.S. population and land-size equal to the state of Montana, Japan clearly does not have a comparative advantage in agriculture. Yet Japan wants to achieve self-sufficiency for selected products. To achieve such goals, Japan’s agriculture is protected using various measures.
Food security has been a major objective of Japanese agricultural policy. According to the Ministry of Agriculture, Forestry, and Fisheries, Japan is approximately 60% self-sufficient in supplying its own needs for foodstuffs.

However, food self-sufficiency rates vary among different products. For example, food self-sufficiency is greater than 100% for rice, 95% for vegetables, and over 80% for poultry, pork, eggs, milk, and other dairy products. These products are indispensable for the traditional Japanese diet and the government has intervened extensively in the markets to protect domestic production of these products. However, substantial quantities of feed grains, oilseeds, and wheat must be imported. The self-sufficiency rate for forage grain was only two percent in 1980.

Figure 6. Hypertext Information on Self-Sufficiency.

Japan imports about two-thirds of its total food supply from the world and over 30 percent of these imports come from the U.S. In 1988, Japan imported $35 billion of agricultural commodities from many countries as shown in Figure 1. More detailed information is presented in Table 101.

Do you want to see?

- Historical trends of major imports from the world
- Competition from other countries
- Market share by countries

Figure 7. Imports Menu.

Which topic would you like to see?

- Major imports from the world
- Major imports from the U.S.
- Opportunities for U.S. exporters
- Trade constraints
- GO BACK
- QUIT

Figure 8. Submenu for Major Imports from the World.
Japanese Imports from the World

Figure 9. Bar Graph Showing Levels of Imports from the World.

The user can click the mouse on "Shell Fish" to display a bar graph as shown in Figure 12.

Those who want to learn about strategies for entering the Japanese market may go back to the main menu in Figure 1 and select that topic. Figure 13 appears. On this screen, many terms are in hypertext. The user familiar with or not interested in exploring the information further would move on to the next topic. Those who want more information about the term would select it by pointing and clicking the mouse to display more information. For example, if the user wants to find an advertising agency, he or she may select "advertising agencies" and Figure 14 will be displayed. The code MMI in the bracket is a reference for the source of information.

Point and click the mouse on one of the following highlighted topics.

- Beef, fresh, chilled, or frozen
- Pork, fresh, chilled, or frozen
- Offal, edible - fresh, chilled or frozen
- Wheat, meal or flour
- Unsalted Fish, fresh, chilled or frozen
- Shell Fish, fresh, chilled or frozen, prepared or preserved
- Maize, unmilled
- Cereals, unmilled and preparations
- Lemons (including grapefruit)
- Soybeans

Press the <SPACE-BAR> when done.

Figure 10. Submenu for Imports from the World.
If the user is interested in seeing a list of advertising agencies, he or she can select "Advertising agencies" and Figure 15 will appear. Selecting any of the agencies will display the name, address, and telephone number of the company. This illustrates how the reader can locate the needed information quickly without wading through enormous amounts of irrelevant information.

1987 Japanese Shell Fish Imports from Top 10 Partners

Figure 12. Bar Graph Showing Levels of Imports from Various Countries.
To enter Japanese markets, U.S. food processors who wish to pursue business in Japan should go to Japan to look around; tap resources of U.S. government agencies; visit JETRO; talk with trade associations, trading companies, food service distributors, advertising agencies, market research companies, and marketing consultants; and develop contacts with potential customers. It is also important to visit shipping companies, and if possible, a competing factory in Japan. [MMI]

Figure 13. Information on How To Enter the Japanese Market.

Talk to advertising agencies who are particularly adept at food advertising and have successful experience in launching U.S. food products. The agencies representing Coca Cola, Kentucky Fried Chicken, McDonald's, Nescafe, Ore-Ida, M & M Mars, and Del Monte would all be helpful. [MMI]

Would you like to see a list of Advertising agencies?

Figure 14. Hypertext Information on Advertising Agencies.

Many agencies have strong experience in the launching of food products in Japan. The following list provides the top 25 advertising agencies in order of size based on billings:

1. Dentsu  
2. Hakuhodo  
3. Daiko  
4. Tokyo Agency  
5. Dai-Ichi Kikaku  
6. Yomiuri Kokoku-sha  
7. Asahi Tsushin-sha  
8. McCann-Erickson Hakuhodo  
9. Ashi Kokoku  
10. Dai-Ichi Kokoku-sha  
11. Chuo-Senko  
12. Orikomi  
13. Kyodo Kokoku  
14. Sogei  
15. J.W. Thompson  
16. Nihon Reizai-sha  
17. Dentsu Y & R  
18. Nippo  
19. Meitsu  
20. Tokyo Agency Intl.  
21. Nihon Reizai Kokoku-sha  
22. Sankyo-sha  
23. Nihon Kotsu Jigyo-sha  
24. Ad. Melco

Figure 15. Hypertext Information Listing Various Advertising Agencies.
SUMMARY

Access to pertinent information is critical to success in international trade. Even though information about international trade abounds, access to specific information needed for decision making is difficult. The International Trade Information System (ITIS) was developed to provide small and medium-sized agribusiness firms basic information about countries, trade, and commodities that is needed for their decision-making about exporting.

ITIS integrates relevant information and packages it into an easily understandable and usable form. We have collected vast amounts of information about international trade from many different sources for five Pacific Rim nations—Japan, Taiwan, South Korea, Hong Kong, and Singapore. The information includes an overview of each country, agricultural policy, production and consumption, imports, tariff and other trade barriers, export opportunities, and consumption patterns. We plan to have annual updates of the system to incorporate new information as it becomes available, and to delete old information as it becomes obsolete.

ITIS is developed using two advanced computer software technologies, an expert system and hypertext, to provide unprecedented power. By using these technologies, the system allows the user to utilize the power of the computer to locate and display information intuitively and interactively. It also lets the user control the information to be displayed and the level of detail to view.

We plan to expand the development of ITIS to include up to 40 nations. In developing ITIS, we have learned that large databases can use much hard-disk space. Therefore, we may use CD-ROM when the system is expanded to 40 countries. Hopefully, ITIS can provide agribusiness needed information for their decision-making so that they can target or tailor their products to meet the needs of foreign consumers and enhance their exports. ITIS can also be used as an educational device for those who want to learn about international trade in Pacific Rim nations.

REFERENCES